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ACER/CEER

Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2013

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October 2014



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Foreword by the Chair of ACER's Board of Regulators and CEER, and by the Director of ACER



We are pleased to present the third joint annual Market Monitoring Report by the Agency for the Cooperation of Energy Regulators (“the Agency”) and the Council of European Energy Regulators (CEER). By producing a joint Report, we aim to provide a comprehensive assessment of developments in the electricity and gas sector and on the progress towards the implementation of the Third Energy Legislative Package (3rd Package) and the completion of the internal energy market (IEM). The European Commission President designate’s announcement that he will promote a major initiative – the Energy Union – confirms the continuing importance of EU energy policy and of the integration of EU energy markets in the coming years. The data and conclusions presented in this Report are also meant to inform and contribute to this initiative.

This Report covers the same areas as last year – retail electricity and natural gas prices, access to the networks including access of electricity produced from renewable energy sources, and compliance with the consumer rights laid down in Directive 2009/72/EC and Directive 2009/73/EC – expanding the analysis and again focusing on the remaining barriers to the completion of a well-functioning internal electricity and gas markets.

By the end of 2013, the Agency has delivered the framework guidelines in all the eight areas (four in electricity and four in gas) identified by the European Commission as key for supporting the integration of the IEM. So far, 12 of the 14 related Network Codes have been recommended for adoption and three of them have actually been adopted. The Agency and national regulatory authorities for energy have been working in supporting the finalisation of the remaining Network Codes and in promoting their rapid implementation, in many cases, on a voluntary basis, even before their provisions become legally binding. The aim is to ensure that EU energy consumers can reap the benefits of a well-functioning IEM, in terms of more choice and better prices, as soon as possible. In this context, this Report assesses how close the electricity and gas sectors are in the achievement of these goals and where further regulatory action is needed to remove any remaining barriers.

Our findings show that, despite the continuing economic stagnation and decreasing wholesale energy prices in many jurisdictions, EU electricity and gas retail prices have maintained an upward trend, often driven by the dynamics of non-contestable charges, even though this trend in 2013 was less pronounced than in previous years. Looking back at the period since 2008, the report shows that there has been little responsiveness between wholesale and retail prices, as well as increasing mark-ups in several Member States.

With a few notable exceptions, there seems to be a vicious circle in the retail energy market of many Member States, where competition between different suppliers is still weak with often little product and price differentiation. This gives little incentives to electricity and gas household consumers to participate actively in the market by exercising choice among available suppliers, as well as price and product offerings. This is in

turn used as a justification for maintaining retail price regulation, which itself hampers competition. This vicious circle needs urgently to be broken by, on the one hand, facilitating consumer switching behaviour and awareness and improving the comparability and comparison of different suppliers' offers; on the other hand, by removing the barriers to entry into retail markets and phasing out price regulation as soon as possible.

At wholesale level, while the electricity market integration progressed with observed improved use of cross-border capacity, this has not always resulted in an increase in price convergence, which actually decreased in the Central-West Europe region during 2013. The rapid implementation of the Electricity Target Model (ETM) in all timeframes, the removal of barriers to the IEM in Member States, further harmonisation of energy policies at Member State level, the integration of renewables in the market and the development of flexibility (including demand-side flexibility) are the main challenges ahead of us in the electricity sector. In gas, price convergence is improving and cross-border capacity contracting is becoming more short-term oriented, especially where liquid hubs operate, even though substantial differences still exist between contractual and actual utilisation values in a significant number of interconnection points. The challenge is to promote the liquidity of gas trading and ensure that all unused capacities, whether or not strategically acquired, can be easily returned to the market so that other shippers can use them if short-term trading opportunities arise.

The data used for compiling this Report have been collected and provided by national regulatory authorities for energy (NRAs), the European Commission and the European Networks of Transmission System Operators (ENTSOs) for electricity and gas. We are grateful to all for their contribution. Our most sincere appreciation also goes to our colleagues in the market monitoring team at the Agency for their sustained effort in continuously monitoring market developments and in producing this Report.

The Agency is committed to continue monitoring progress towards the completion of a well-functioning internal energy markets. The Agency is also looking into whether the Electricity and Gas Target Models – common visions for the internal electricity and gas markets – need to be enhanced to address the new challenges that these sectors will face beyond 2014. A specific initiative *Energy Regulation: A Bridge to 2025* was launched by the Agency, in cooperation with CEER, late in 2013 and has recently resulted in the Agency issuing its Recommendation on the regulatory response to the future challenges emerging from developments in the internal energy market.

Working nationally, regionally and at European level with policy makers, notably with the European Commission and the European Parliament, and the industry, energy regulators remain committed to putting the legal, regulatory and operational framework in place that will deliver an internal market in energy for the benefit of Europe's consumers.



Lord Mogg
Chair of ACER's Board of Regulators and CEER



Alberto Pototschnig
ACER Director

Executive Summary

Introduction

Structure of the report This is the third annual Market Monitoring Report (MMR) by the Agency for the Cooperation of Energy Regulators ('the Agency') and the Council of European Energy Regulators (CEER), covering the developments in EU electricity and gas markets in 2013. Expanding on the analysis performed last year, this report again focuses on retail markets and consumer issues, on the main developments in gas and electricity wholesale market integration and on network access issues. It also provides an analysis of the remaining barriers to further market integration.

The report is divided into four chapters: (i) the electricity and gas retail market; (ii) the electricity wholesale market; (iii) the gas wholesale market; and (iv) consumer protection and empowerment. Both wholesale chapters report on network access issues.

Retail electricity and gas markets

In order to assess the state of play in retail markets in 2013, the Agency and CEER expanded the analysis and the breadth and depth of the data collected for this purpose, compared to 2011 and 2012. The report focuses on the evolution of retail prices by component and on other relevant factors, including market concentration, wholesale retail mark-ups, entry and exit activity, and consumer switching behaviour.

Retail prices Despite continued low economic growth in 2013, energy retail prices rose for both households and industrial consumers in the majority of EU Member States (MSs), although the increase was lower compared to 2012, in particular for gas. From 2012 to 2013, European post-tax electricity prices increased on average by 4.4% (+4.6% in 2012) for households and by 2.0% (+5.2% in 2012) for industrial consumers. Post-tax gas prices for household consumers rose by 2.7% (+10% in 2012) and decreased for industrial consumers by 1.2% (+11% in 2012).

In most countries, household energy prices are greatly influenced by non-contestable charges (i.e. taxation and network charges), which usually make up more than half of the total energy bill. Large disparities in pre-tax electricity and gas prices for both households and industrial consumers persist across Europe, reflecting the heterogeneity of national energy policies. For example, Danish and Swedish household consumers pay on average more than three times the price of Romanian and Bulgarian households for their electricity and gas.

Taxation and network charges Since 2008, and particularly over the last few years, these non-contestable charges have significantly increased in many countries, especially as a result of costs related to support schemes for renewable energy sources (RES). At the same time, electricity wholesale prices have decreased, mainly under the pressure of subsidised RES. For some countries, such as Austria, Germany,

Ireland and Slovenia, the 2013 increase in RES charges was almost completely offset by a decrease in the energy component due to falling electricity wholesale prices. As a consequence of this mechanism, retail price competition is weakened by the decreasing contestability of end-user prices.

Competition in retail markets	<p>The energy component of the post-tax price, i.e. the contestable part, depends to a great extent on the level of competition in the market. The monitoring results show that the moderately concentrated electricity retail markets of Denmark, Finland, Germany, Great Britain, Italy, Norway, the Netherlands and Norway perform relatively well, judged on the basis of key competition performance indicators (e.g. choice of suppliers and offers; switching rates; entry-exit activity; consumers' experiences; mark-up etc.). The same is true for the British, Czech, Dutch, German, Slovenian and Spanish gas retail markets, although in gas retail markets are often more concentrated than in electricity. Retail competition performance indicators show no or weak signs of competition in MSs with highly concentrated markets at the national level: in electricity in Bulgaria, Cyprus, Hungary, Latvia, Lithuania, Malta and Romania; in gas in Bulgaria, Croatia, Hungary, Latvia, Luxembourg and Poland.</p>
Consumer choice and switching behaviour	<p>The majority of electricity and gas household consumers do not participate actively in the market by exercising choice among available suppliers, as well as among different price and product offerings. As a result of this non-participation, the proportion of electricity and gas household consumers supplied by another supplier than the incumbent is still very low in the majority but a few countries: Great Britain, Belgium and Portugal (both markets), Norway and the Czech Republic in electricity, and Germany, Spain and Ireland in gas markets.</p> <p>The monitoring results for 2013 confirm the 2012 findings regarding the positive correlation in gas between saving potentials from switching and switching rates across Europe. In electricity, no clear pattern has been detected. Non-quantifiable aspects of consumer behaviour might act as a barrier to retail entry in some MSs, such as consumer loyalty, inertia and risk aversion.</p> <p>Electricity and gas consumers in liberalised (i.e. non-price regulated) countries can choose from among several offers provided by different suppliers on the market. According to a data sample based on offers in the capital cities, the electricity and gas markets of Germany, Great Britain, Denmark and the Netherlands are the relative best performers in relation to the number of offers and suppliers providing diversified products for electricity and gas consumers, such as the type of energy pricing, green offers, additional free services and/or dual fuel offers.</p> <p>Consumers in countries with more choice and higher switching rates also tend to be more satisfied, which is shown in the results of a consumer survey undertaken in 2013 for DG SANCO Scoreboard. For instance, consumers in Belgium, Germany, Finland, Luxembourg, Slovakia and Slovenia have the most positive experience of the electricity and gas markets in their respective countries (i.e. they are the best scoring countries in the following four ele-</p>

ments: 'expectations', 'choice', 'comparability' and 'ease of switching'). Bulgaria, Croatia, Hungary, and Romania are at the bottom of the ranking. The high difference between the scores on different elements is a clear indication that the performance in these markets is highly country-dependent and thus open to improvement at a national level.

Despite the general proliferation of different products (e.g. many suppliers are offering green, fixed, dual-fuel etc.), which appeal to consumers, it is also evident that suppliers in some countries are innovating very little, if at all (e.g. electricity and gas suppliers in Bulgaria, Greece, Latvia and Romania; electricity suppliers in Cyprus and Malta; and gas suppliers in Croatia, Finland and Poland). This is arguably linked to the dominance of the incumbent electricity or gas suppliers which, in the absence of competitive pressure, do not have strong incentives to differentiate their products.

Barriers to entering retail energy markets

To improve consumer switching behaviour and awareness, national regulatory authorities (NRAs) should be actively involved in ensuring the prerequisites for switching, such as transparent and reliable online price comparison tools and transparent energy invoices. Furthermore, NRAs should proactively advocate the establishment of switching procedures and make consumers aware of switching options.

Consumer choice and consumer engagement in general can be facilitated by having reliable web comparison tools in place (allowing comprehensive and easy ways to compare suppliers), adopting standardised fact sheets for each retail offer, publishing easily comparable unit prices in terms of standing charges and variable rates for standard consumption profiles, and promoting systems/platforms fostering collective switching. These measures do not interfere with the ability of suppliers to set prices.

In a dedicated study commissioned by the Agency, retail suppliers were interviewed about the barriers to entering retail energy markets at the EU level. The key perceived barriers are the lack of harmonisation of MSs regulatory frameworks, the persistence of retail price regulation, high uncertainty concerning future regulatory developments and low liquidity of wholesale markets, particularly in less developed markets. The interviewees also identified low margins and tough competition as an issue in specific, more developed markets.

Although regulated end-user prices for households still exist in 15 out of 29 countries in electricity and in 15 out of 26 countries in gas, the trend towards their removal continued during 2013. Two (Estonia and Greece) MSs removed price regulation for electricity in 2013. In Italy, electricity and gas standard offer prices for households are set based on wholesale prices and standard margins. The Agency notes that plans are in place for the further removal of price regulation in a number of other MSs during 2014.

In a number of MSs, public authorities set energy retail prices with greater attention to political considerations than to underlying supply costs. In some

MSs, regulated prices are set below cost levels, which hampers the development of a competitive retail market. In other MSs, the public authority (usually the NRA) sets end-user prices with reference to wholesale prices (for instance, Italy and Portugal).

Regulated prices should be set at levels which avoid stifling the development of a competitive retail market. They must be consistent with the provisions of the 3rd Package, and should be removed where a sufficient level of retail competition is achieved.

As indicated in last year's MMR, in order to promote market entry further, MSs should follow best practice by: (i) allowing free opting in and out of regulated prices; (ii) setting the regulated price at least equal to or above cost; and by (iii) updating the regulated price to reflect the sourcing cost as much and as frequently as possible. In this way, they could facilitate the development of retail competition.

Consumer protection and empowerment

Supplier of last resort and disconnection for non-payment

While the MMR 2012 assessed the level of compliance with provisions for consumer rights in the 3rd Package, the MMR 2013 closely explores the underlying mechanisms of how EU law has been transposed into national legislation and how final household consumers are protected in practice. A series of indicators measure how consumers currently benefit from protection under the respective provisions from the 3rd Package in each country. In several cases, they indicate examples of best practice, where MSs have gone beyond the legal requirements.

EU provisions concerning supplier of last resort (SoLR) and restrictions to disconnections from the grid have been widely implemented in national legislation. While SoLR mechanisms have been established in almost all countries, there are considerable differences in their functions across MSs. The most prevalent application of SoLR is for the provision of supply in cases where a customer's original supplier fails (e.g. bankruptcy or license revocation). However, roughly half of countries also foresee a SoLR to support economically weaker consumers (e.g. those that no energy supplier is willing to contract with), as well as inactive consumers, although this is labelled as default supply in some countries.

As for disconnections resulting from non-payment, the percentage of customers disconnected in 2013 was generally low (ranging from estimates of less than 1%, with one notable exception at 6.7%, Portugal). For the MSs examined, no systematic difference was detected between electricity and gas disconnection rates. However, despite a monitoring duty in the 3rd Package for disconnection rates, roughly half of NRAs (14 MSs) were able to provide information on 2013 disconnection rates.

Prior to effecting the disconnection, in most MSs a legal minimum period applies to the disconnection process. This period varies considerably across

MSs, ranging from ten to 200 days. However, considerably less information is available on the actual duration of the disconnection processes, as energy service providers exercise some liberty in deciding whether or not to disconnect their customers in the first place. Here, NRAs have less information about the practicalities of disconnections, which may also vary within countries because of different company policies. Nevertheless, the available figures indicate that the actual duration of a typical disconnection process due to non-payment may be considerably longer than legally required (e.g. in Great Britain, the legislation specifies 28 days for the disconnection process; however, in practice it takes 80 days).

Vulnerable consumers Regarding the protection of vulnerable consumers and the application of adequate safeguards, the majority of MSs have defined the concept of vulnerable customers. However, MSs take different approaches to protecting these groups of consumers, in some cases through social or other protection mechanisms rather than an explicit concept of vulnerable energy customers. Therefore, the report takes a closer look at specific protection mechanisms in order to grasp the kind of support available to these consumers. The most frequent measures taken to protect vulnerable consumers are restrictions on disconnection due to non-payment. This mechanism is in place in 16 out of 23 MSs (electricity) and 11 out of 21 MSs (gas).

Other common means to support vulnerable consumers are special energy prices (also known as social tariffs) and earmarked social benefits to cover energy costs. Support mechanisms such as a certain amount of free energy or exemptions from specific cost components of energy are rare. While national suppliers may offer some types of repayment plan (i.e. deferred payment), a consumer's right to deferred payment is not widespread across MSs. It is important to note that the definition of vulnerability can differ between MSs, resulting in different percentages of vulnerable customers across Europe. While some MSs (Ireland, Lithuania, Portugal and Slovenia) report shares below 2%, others (Greece, Malta and Romania) indicate over 10% of household consumers as vulnerable. However, comparisons between countries are limited due to the vast differences in the definition of the concept of vulnerable customers, national differences in the social security system, varying benefits in the energy sector and/or state of national economies at the time.

Consumer protection Consumer protection also extends to the availability of adequate and accurate information regarding prices. In 17 MSs, there are legal requirements regarding advance notification of price changes. Meanwhile, in almost all countries, there are legal requirements to provide consumers with information about changes to other components of the energy costs (e.g. network tariffs, taxes, etc.). The specific advance notice period required varies between 15 and 90 days for different MSs. In 13 out of 17 MSs with the legal requirement, one month is required.

Regarding non-price related information, consumers' bills contain supplier details, payment modalities and consumption data in almost all countries. In most countries, information on the right to dispute settlement and contact de-

tails for the distribution system operator (DSO) are available on the bill. It is less common to find the best practice, which is information on how to switch suppliers and the duration of the contract. Consumers also have a right to independent information via a single point of contact, which MSs are required to establish. Almost all of the respondent countries indicate that they have such a service in place; this may be shared by several authorities (e.g. NRA, ombudsman and government).

Supplier switching,
metering and
billing

The possibility for consumers to exercise their right to switch supplier can place competitive pressure on suppliers to deliver the best services at the best prices. In most MSs, supplier switching is performed, as required by law, within three weeks. While some MSs have yet to implement this provision in law and/or practice, four are working towards a faster process: electricity supplier switching should be performed in one working day in France, five in Ireland and Portugal, and ten in Denmark. EU legislation also requires the settlement (final) bill following a switch to be provided within six weeks. In most countries, this provision has been implemented and is applied in practice, although six MSs (Bulgaria, the Czech Republic, France, Hungary, Lithuania and Slovakia) have a shorter period.

Smart meters can facilitate supplier switching and enable more frequent information on consumption and billing; their roll-out is being undertaken progressively in many MSs. In Finland, Italy and Sweden, the roll-out for electricity smart meters has been completed, while Denmark, Slovenia and Spain have a significant share of smart meters already installed. For the moment, in the gas sector, Denmark, Great Britain, Italy and the Netherlands have begun a roll-out for a small share of consumers. In MSs where smart meters are not in place, most consumers receive information on their actual consumption on an annual basis.

Complaints and
dispute resolution

All regulators collect data on complaints, as the number and reasons for reported complaints can help detect market dysfunctions and assess the degree of consumer satisfaction. A minority of NRAs provided data on the number of household consumer complaints received by suppliers and/or the DSOs. This suggests that the requirement of the 3rd Package regarding the monitoring of complaints by NRAs are implemented differently across MSs. Reported figures fall in a range between one and six per 1,000 inhabitants in countries where data is available. However, exceptions raise some questions regarding the comprehensiveness and/or the robustness of this reporting, as well as the definitions and methodology applied in collecting the data. All NRAs reported that there is an alternative dispute resolution (ADR) scheme in their country. However, only a few were able to report figures for the number of ADR cases, which shows that there is scope to improve systematic reporting on this issue.

Some countries still have no statutory complaint handling standards, while the legally allowed processing time for suppliers/DSOs to deal with complaints is between one and two months for both electricity and gas. However, in some countries the processing time is shorter, such as nine to 15 days, or longer, such as up to four months. The time required for the ADR body to settle a dis-

pute varies from country to country between one and six months.

Conclusions and recommendations

Overall, the monitoring results presented in the consumer protection and empowerment chapter show that many of the national legal provisions (de jure) are applied in practice (de facto) on a similar basis (with a practical approach outperforming the legal requirement in some cases).

Some MSs perform better than the requirements of some provisions for consumer rights in the 3rd Package. For instance, four MSs perform better as regards the maximum duration of a supplier switch.

However, there remains significant room for improvement in: i) the monitoring of the number and the practicalities of disconnection due to non-payment; ii) the systematic collecting of data on consumer complaints (e.g. ADR); iii) the implementation of statutory standards for handling complaints (such as a shorter response time); iv) the information provided in bills about supplier switching options; and v) the frequency of informing consumers on their actual consumption.

Wholesale electricity market integration and network access

Price convergence and market integration

In 2013, market coupling continued to be an important driver of wholesale electricity price convergence. For instance, the Czech, Hungarian and Slovakian prices significantly converged following the extension of market coupling from the Czech Republic and Slovakia to Hungary in September 2012.

There remains significant scope for further wholesale electricity price convergence across the EU. In 2013, the Central-West Europe (CWE) region recorded the most significant decrease in price convergence (down by 32% compared with 2012). This is explained by other important factors, for example, RES penetration and cheap coal in the international markets drove German prices down more than elsewhere in the region, due to the relatively high proportion of RES and coal-fired generation in Germany.

The market coupling of Great Britain with the CWE, Nordic and the Baltic regions through the North-West European (NWE) Price Coupling initiative, launched on 4 February 2014, is expected to improve price convergence across all these regions in the coming years.

Use of interconnector capacity

In 2013, the efficient use of interconnectors continued to increase, due to market coupling, reaching a level of efficiency of 77% in the day-ahead timeframe. The areas for greatest further potential improvement in efficiency are on the Swiss borders, on the border between Great Britain and Ireland, and within the Central-East Europe (CEE) region, due to the lack of market coupling, among other factors.

The combined analysis of available intraday cross-border capacity and intraday price differentials shows that the available capacity in the intraday timeframe was frequently underutilised in 2013 (more than 40% of the times, the

capacity remained unused in the economic direction). The analysis of existing intraday congestion management methods in Europe shows that the implementation of the intraday Target Model will contribute to both improving efficiency in the use of intraday cross-border capacity and to accommodating the increasing amount of RES. Moreover, in 2013, the exchange of balancing services across EU borders was still incipient. The analysis shows that substantial benefits (in the order of several hundred million euros per year) could be achieved from the exchange of balancing services, which confirms the idea that Europe should urgently pursue the further harmonisation and integration of balancing markets.

Forward markets

In Europe, two forward market designs have emerged in order to provide market participants with hedging opportunities against short-term (e.g. day-ahead) price uncertainties. The first design, which was implemented in the Nordic and Baltic countries and on the internal borders of Italy, relies mainly on the market and on a variety of contracts linked to a hub price, which represents some sort of average day-ahead price within this group of zones (multi-zone hub). The second design, which is implemented in nearly all MSs in continental Europe, gives an additional and specific role to transmission system operators (TSOs) which are responsible for calculating long-term capacities and auctioning transmission rights (TRs). This design includes a set of hedging contracts for each bidding zone which are linked to the day-ahead clearing price of this bidding zone (single-zone hub). Systematic differences have been observed between the marginal price of Physical TRs (PTRs) and day-ahead price spreads. For instance, between 2011 and 2013, negative risk premiums (i.e. the differential between the price of transmission rights and realised delivery date spot prices) exceeded one euro per MWh on two-thirds of the assessed borders. These differences may be due to several reasons (including the level of competition in the different auctions, the likelihood of periods of curtailments and firmness regimes, the amount of capacity offered by TSOs and the design of secondary capacity markets).

Unscheduled flows and the IEM

Unscheduled flows (UFs), which consist of loop flows (LFs) and unscheduled transit flows (UTFs), remain a challenge for the further integration of the internal energy market (IEM). Such flows are particularly pronounced in the CEE, CWE and Central-South European (CSE) regions. Their persistence reduces tradable cross-border capacity and the associated social welfare. Welfare losses due to unscheduled flows show an increasing trend since 2011 and reached nearly half a billion euros in 2013. Moreover, the high volatility and limited predictability of LFs and UTFs are a challenge for the operation of the network.

The impact of UTFs can be mitigated with further coordination between TSOs in capacity calculation and allocation (implementation of flow-based methods), while the impact of LFs can be mitigated by improving the bidding-zone configuration and also investments in transmission infrastructure in the mid- and long-term, respectively.

Therefore, appropriate monitoring of LFs and associated externalities, along with the implementation of adequate remedial actions, is urgently needed.

There is insufficient transparency with regard to the level of LFs and UTFs and with regard to the number and costs of remedial actions applied by TSOs to remedy the negative effects of these flows.

The recently adopted 'Transparency Regulation' should help improve the situation, especially with respect to the costs incurred and the actions undertaken by TSOs. It is important that the relevant parties make available all the information listed in the above-mentioned Regulation through the Transparency Platform of the European Network of TSOs for Electricity (ENTSO-E), which will become operational by February 2015.

Integrating intermittent generation into EU power systems

The increasing penetration of intermittent RES poses a challenge to TSOs in terms of balancing supply and demand. This is because the output generated by such energy sources is difficult to predict and is unrelated to conventional electricity demand patterns.

In view of the increasing share of RES-based generation, TSOs will have to draw on additional (flexible) resources to be able to balance systems instantly in an efficient way. The most economically efficient way to pursue the deployment of sufficiently flexible resources in the system is to create a well-functioning energy market that attracts existing resources through efficient pricing. If the value of flexibility is adequately reflected in market prices, it will send appropriate market signals to stimulate the right power stations to remain active in the market, and to stimulate the right amount of investment in both new generation (if needed) and networks.

Implementation of the ETM

Therefore, the full implementation of the ETM for cross-border trade, in particular in the intraday and balancing timeframes, remains a priority in order to ensure that prices reflect the costs of flexibility. Moreover, flexibility in wholesale electricity markets (including RES balancing) requires efficient and well-integrated gas markets, which depends on, *inter alia*, balancing regimes, flexibility tools (such as storage and line-pack), nomination and re-nomination lead times, the bundling of capacity products at border points, transparent and consistent cross-border transportation tariffs and well-functioning secondary capacity markets and platforms.

Demand-side flexibility in electricity and gas

Demand-side participation in energy markets can also contribute to more flexibility in the system. A study commissioned by the Agency assessed the state of play and the potential benefits of demand-side flexibility (DSF). It distinguishes between implicit DSF, i.e. flexibility that is implicitly valued, e.g. when consumers choose to change their consumption in response to time-based price signals, and explicit DSF, i.e. flexibility that is explicitly rewarded in the market, e.g. when customers are requested to change their demand in response to a system operator signal. In electricity, the study estimates the potential benefits of implicit DSF to be 0.4 billion euros per year for the EU. The financial benefits of explicit DSF are more uncertain and are expected to range from 3 billion euros per year to 5 billion euros per year for the EU in 2030. In gas, the potential for implicit DSF is more limited than in electricity,

while explicit DSF may be useful for increasing system reliability in demand or supply emergencies and reducing the cost of managing network congestion.

Currently, implicit DSF (in the form of time-based retail prices) is available to 92% of electricity consumers. Implicit DSF is less common for gas (only available to residential consumers in 10% of MSs). The availability of explicit DSF is lower than in the case of implicit DSF. In electricity, a significant number of MSs stated that they are currently developing plans for demand-side participation in the wholesale or balancing markets (e.g. participation in the balancing markets is possible or planned to be introduced in 55%, respectively 40%, of MSs), although not always on an equal basis with generation. In gas, the most common forms of explicit DSF are reductions and interruptions called directly by the DSO or TSO, which are available in 50% of the MSs.

Overall, the presented inefficiencies illustrate the urgent need to finalise the implementation of the Electricity Target Model (ETM). In particular, there remains significant scope for improvement in: i) the use of existing cross-border capacity in the different timeframes (i.e. long-term (LT), day-ahead (DA), intra-day (ID) and balancing market (BM)); ii) TSOs coordination on capacity calculations and allocation; iii) configuration of bidding zones; and iv) facilitating demand-side participation.

Gas market integration and network access

Demand and price trends EU-26 natural gas consumption totalled roughly 5,000 TWh in 2013, a decrease of 1.2% compared to 2012. A significant proportion of this reduction was observed in gas demand from electricity producers, mainly as a consequence of the rise of coal as the fuel of choice and the increasing penetration of RES for electricity production.

During 2013, the supply of Russian gas to the EU increased significantly. The main driver of this development was the increased willingness of Gazprom to renegotiate the pricing of its supplies, which is arguably due to excess production capacity and increased competition, such as the development of organised EU markets, the expansion of interconnection infrastructure and the potential threat from LNG and unconventional gas production. Other drivers, although less important, include the need to replenish EU gas storage stocks after the low stock levels reached at the end of the 2012/2013 winter and the significant rise in German gas demand, as Germany is the MS with highest gas consumption in the EU, with Russian gas being the key source. Russian exports were also supported by a disruption of Norwegian flows during the summer and by a decline in LNG imports.

Several Central and Eastern European countries are striving to diversify their gas sources in order to reduce their dependence on Russian gas, and have been looking to Western Europe's spot markets as alternative sources. Larger counter-flows from Germany and Austria to the Czech Republic, Poland and Slovakia were observed. These commercial counter-flows are expected to increase in the future, given the profitable price spreads and the on-going

procedures, driven concerns over security of supply, to enable or enlarge bi-directional capacity. Flows from Hungary and Poland to the Ukraine were also registered, as in 2013 the Ukraine was faced with high-priced Russian gas and was seeking alternative supplies from Central European hubs.

Cross-border capacity contracting is becoming more short-term oriented due to developments in the commodity market enabled by new rules on capacity allocation and congestion management, where these are implemented, especially in those MSs featuring more liquid hubs. However, substantial differences still exist between contractual and actual utilisation values in a significant number of European Interconnection Points (IPs). Although peak capacity utilisation values more closely follow contractual ones, the challenge is to ensure that all unused capacities, whether or not strategically acquired, can be easily returned to the market so that other shippers can use them if short-term trading opportunities arise.

Diversifying gas sources	Several hubs are developing robust price references against which supply contracts can be indexed or on which hedging strategies can be based. Hub supply sourcing is also increasing in several Central European countries. Shippers in these MSs are increasingly relying on recently established hubs, as well as on the more liquid adjacent ones, for supply and arbitrage activities. This is having a positive effect on competition in the region, despite overall price responsiveness being subdued by the persistence of long-term contracts. In order to further increase arbitrage possibilities, as well as from a security of supply perspective, there is a need to focus on more reverse-flow capacity possibilities.
Wholesale market integration	The monitoring results show that progress continues to be made towards wholesale gas market integration. Price convergence between MSs – an important measure of the extent of market integration – has increased, principally as a result of increased price competition, leading to more long-term contract renegotiations. Although prices at the main NWE hubs remained relatively stable compared to 2012, downward pressure on import gas prices was partially exerted in some markets as a result of increased competition following the development of new trading hubs and the delivery of new interconnection capacity.
Welfare losses	Higher price convergence has reduced the overall EU-26 gross welfare losses – measured as the price deviation of each EU MS versus the baseline reference price of the Title Transfer Facility (TTF) in the Netherlands – in comparison to 2012. Nevertheless, significant theoretical welfare gains could still be achieved through the optimisation of physically unused cross-border capacities. The analysis indicates that potential gains between 0.5 and 2 billion euros could be obtained by optimising the use of physical capacity in those cross-border IPs connecting price zones with significant wholesale price differences.
Gas storage utilisation	The winter-summer gas price spread, a major driver of gas storage utilisation, shows, with the exception of the 2012/13 winter, a decreasing trend over recent years. If the general trend in favour of lower winter-summer spreads continues, it is likely that gas storage utilisation rates will remain relatively

low. However, if higher winter-summer spreads develop, as in the winter of 2012/13, it is likely that storage utilisation will respond, as happened in that period. The uncertainty around long-term winter-summer spreads could reduce the incentive to invest in new or existing gas storage facilities. Given the long investment lead times for delivering new gas storage capacity, investors may not be able to anticipate an unexpected increase in gas storage demand. Therefore, the monitoring of aggregate EU gas storage capacity trends for security of supply reasons is appropriate.

Market integration and GTM

Despite significant advances, barriers to full market integration remain, including: lack of liquidity in many wholesale markets (ten MSs rely on a single country of origin for more than 75% of their supply); lack of transparency in wholesale price formation; the lack of adequate gas transportation infrastructure and the presence of long-term commitments for gas supply. These barriers and their implications were identified in the 2012 MMR, and they remained in 2013, albeit more or less pronounced in different regions.

The Gas Target Model(s) (GTM) and the proposed provisions in the various framework guidelines and network codes (FGs/NCs) focus on improving internal market integration and functionality. Some of the measures recommended, and in some cases already implemented, include the definition of appropriate market features; the offering of cross-border bundled capacity from/to virtual trading points supported by trading platforms; the setting of harmonised entry-exit tariff structures; the establishment of coordinated capacity allocation and congestion management mechanisms; the introduction of market-based balancing instruments and the potential merging of market zones to enlarge liquidity.

The bundled allocation of IPs capacity, the synchronised implementation of CMP mechanisms, the implementation of balancing provisions and the implementation of interoperability arrangements are advancing in the majority of MSs.

Consistent with its mandate to promote cross-border trade and EU market integration, the Agency is working on implementing the key principles of the Gas Target Model through its framework guidelines and the resulting binding Network Codes on Capacity Allocation Mechanisms, Balancing, Harmonised Gas Transmission Tariff Structures, and Interoperability. The Comitology Guidelines on Congestion Management Procedures (CMP) are now in force. These provisions, along with the full transposition of the 3rd Package, must ensure that European consumers benefit from an integrated internal gas market.

Conclusions

This report presents the main developments in the EU energy sector in 2013. It identifies those areas where additional measures (and monitoring) are needed in order to ensure that EU electricity and gas consumers benefit from fully integrated markets. The report demonstrates the welfare losses from imperfectly integrated and fragmented energy markets – in the order of several billion euros per annum – in both the electricity and gas sectors. The report also shows the large disparities in MSs' national energy policies. This may reduce the contribution of the Network Codes to the market integration and harmonisation process and the trust of stakeholders in EU energy markets.

Particular areas for further action remain:

1. Transposition Full transposition and implementation by all MSs of the 3rd Package is essential. The European Commission should continue to monitor this closely.
2. Consumer rights Regulators must continue to promote the implementation of consumer provisions in the 3rd Package, benefiting from CEER's recommendations and advice, along with the Agency's continuous monitoring activities.
3. Market rules and practical implementation The EU-wide network codes and Commission guidelines envisaged in the 3rd Package and their rapid and preferably early implementation are imperative for fostering the market integration process. The Agency will continue to work with the ENTSOs, the European Commission, NRAs and market players to deliver a full set of binding market and network rules applicable across the EU, and to accelerate their implementation. Wholesale energy markets will be monitored to detect manipulation and abusive practices, which should be sanctioned.

At the same time the EU Infrastructure Package is encouraging the development of adequate cross-border transmission infrastructure to facilitate wider market integration, and REMIT provisions are intended to promote transparency in wholesale markets price formation and to detect and deter abusive behaviour.

Some measures require concerted action by several actors for the benefit of European consumers. The Agency and CEER will continue to support and promote the development of competitive, sustainable and secure electricity and gas markets in the public interest. Both the Agency and CEER remain committed to continuing an open dialogue with all parties and to working with European institutions and MSs in order to deliver and apply the rules necessary to achieve Europe's energy goals in an efficient way.

1 Introduction

- 1 The 3rd Package aims to make energy markets work effectively and to create a single EU gas and electricity market. While significant progress has been made, the objective of full market integration has not yet been achieved and many barriers to the internal energy market (IEM) persist. For instance, at the wholesale level, pan-European technical rules (network codes developed on the basis of framework guidelines) must deliver further improvements in terms of efficient use of the network and network security. Suppliers and users should have easier access to infrastructure and take advantage of lower transaction costs for cross-border trade.
- 2 The Agency for the Cooperation of Energy Regulators ('the Agency') is tasked¹ with tracking the progress of the integration process and the performance of energy markets. To this purpose, the Agency prepares an annual MMR in close cooperation with the European Commission, national regulatory authorities, Bureau Européen des Unions de Consommateurs (BEUC) and other relevant organisations.
- 3 The objective of this MMR is to assess the functioning of the IEM and to show how energy markets can work more efficiently for the benefit of European energy consumers. The MMR provides an in-depth year-on-year analysis of remaining barriers to the well-functioning of the IEM and recommends how to remove them. Pursuant to Article 11 of the Agency's founding Regulation², it concentrates on retail prices (including compliance with consumer rights as mentioned in the 3rd Package), network access (including grid access for renewable energy sources) and barriers to the IEM. This 3rd edition of the MMR has been prepared jointly by the Agency and by the Council of European Energy Regulators (CEER). In addition to analysis undertaken specifically for this report, information from other documents produced by the Agency and by national regulatory authorities (NRAs) has been used³.
- 4 It is worth noting that this MMR is based on publicly available information and on information provided by NRAs, ENTSO-E and ENTSO-G on a voluntary basis, as the reporting requirements contained in the above-mentioned Article 11 are not complemented with data collection powers for the Agency.

1 The legal basis for this is Article 11 of Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing the Agency for the Cooperation of Energy Regulators, OJ L 211/1, 14/8/2009.

2 See footnote 1.

3 Norway applies most of the EU energy legislation, including legislation on the internal energy market, and is included in the data reported in several sections of this report. Switzerland has been reported in some parts of the wholesale sections on the basis of a voluntary commitment of their NRA. Consequently, the terms 'countries'/'EU Member States (MSs)' and 'Europe'/'EU-28'/'EU' are used interchangeably throughout this report.

2 Retail electricity and gas markets

2.1 Introduction

- 5 This 3rd edition of the MMR reports on retail markets in a different way compared to the previous two editions. First, the structure is different, as gas and electricity are reported in a single chapter. Second, on substance, in addition to developments, the chapter addresses certain retail issues in more depth (e.g. how and to what extent consumers are benefitting from the IEM). To address these questions, the chapter analyses price and non-price indicators; in addition, it contains an in-depth analysis of some specific and recurring issues identified as the main barriers to efficient retail market functioning, such as consumer behaviour, end-user price regulation and barriers to cross-border entry into retail energy markets.
- 6 In Section 2.2, this chapter presents the main trends in energy (i.e. electricity and gas) prices and demand in 2013. Section 2.3 assesses the level of competition in retail energy markets, including indicators on market structure, competition performance and consumer behaviour. The focus of Section 2.4 is on barriers to retail market entry, including cross-border entry and retail price regulation. This section also summarises the key findings of two reports commissioned by the Agency on the (potential) benefits of demand-side flexibility and the views of suppliers on barriers to retail competition. Section 2.5 ends this chapter with conclusions.

2.2 Main trends and benefits of retail market integration

2.2.1 Final consumer demand

- 7 In 2013, against a background of low economic growth, electricity demand in Europe remained virtually unchanged for the third consecutive year (0.2%, -0.1% and -0.2% year-on-year variations in 2011, 2012 and 2013, respectively) as shown in Figure 1. The EU-28's electricity demand by final consumers⁴ was 2,966 TWh.
- 8 The demand for natural gas⁵ reached 4,964 TWh in 2013. Compared to the year before, natural gas demand fell by 1.2% per cent, continuing the trend of a falling year-on-year gas demand in Europe (-10.5% in 2011 and -2.2% in 2012). Since most of the natural gas supplied in Europe is consumed by the industrial and commercial sector and for power generation⁶, the reduced rate of demand contraction could be interpreted as a sign of industrial economic recovery. However, it is also relevant to consider that colder than average temperatures in Northern Europe during February and March 2013 contributed to higher than expected household demand during this period.
- 9 In 2013, EU-28 GDP grew by one per cent compared to 2012, which is the lowest year-on-year increase since 2009⁷. This has affected the demand for electricity and natural gas in Europe.

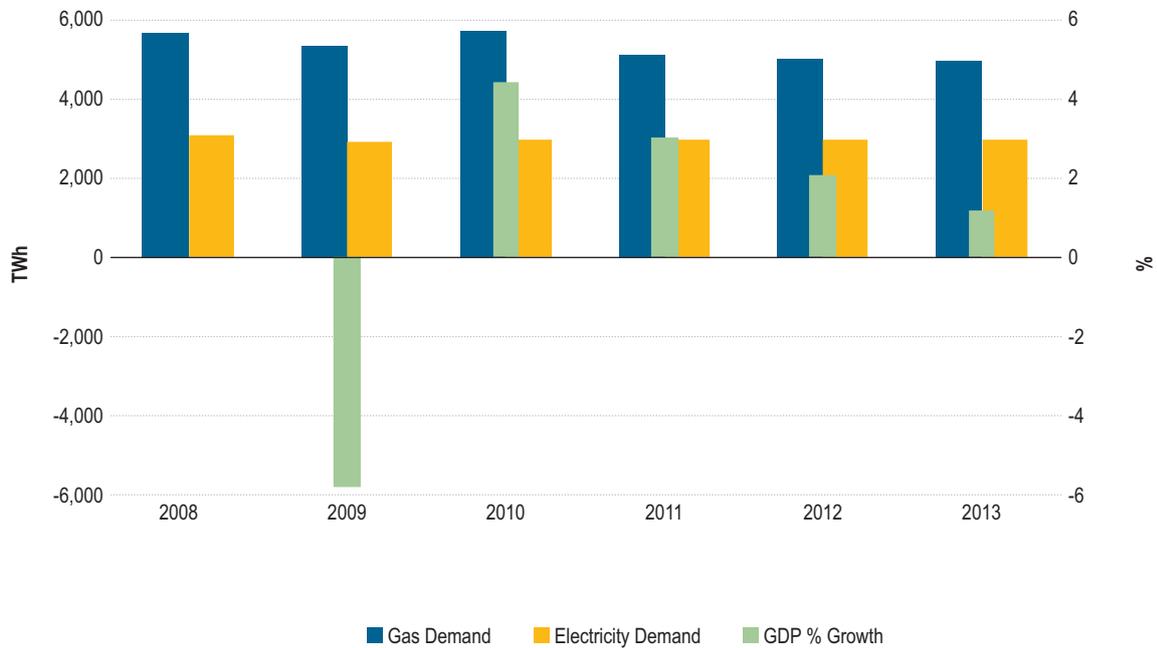
4 Based on the Eurostat supply category of 'electricity available for the internal market', i.e. the amount of electricity to be sold and supplied to the domestic market, including all losses that occur during transportation and distribution, and the amount of electricity consumed in the energy sector for commercial needs.

5 Gross inland annual consumption data used for the years of 2008–2012. For 2013, the Eurostat monthly supply data category of 'gross inland consumption' as of 19 May 2013 is presented. In this category, supply is equal to the sum of production, net imports and stock change. Eurostat data are provisional for some countries.

6 In 2012, 2,049.8 TWh of gas were consumed by the residential and commercial sector, followed by industry (1,575 TWh) and power generation (1,241 TWh). Eurogas, Statistical Report 2013, <http://www.eurogas.org/statistics/>.

7 In 2013, European public debt increased by three per cent compared to 2012, which is the lowest increase since 2009 (by 13%, 12%, 6%, 5% and 3% for the year 2012-2013).

Figure 1: Electricity and gas demand in the EU-28 in relation to GDP – 2008–2013 (TWh) GDP year-on-year change (%)



Source: Eurostat (10/7/2014) and ACER calculations

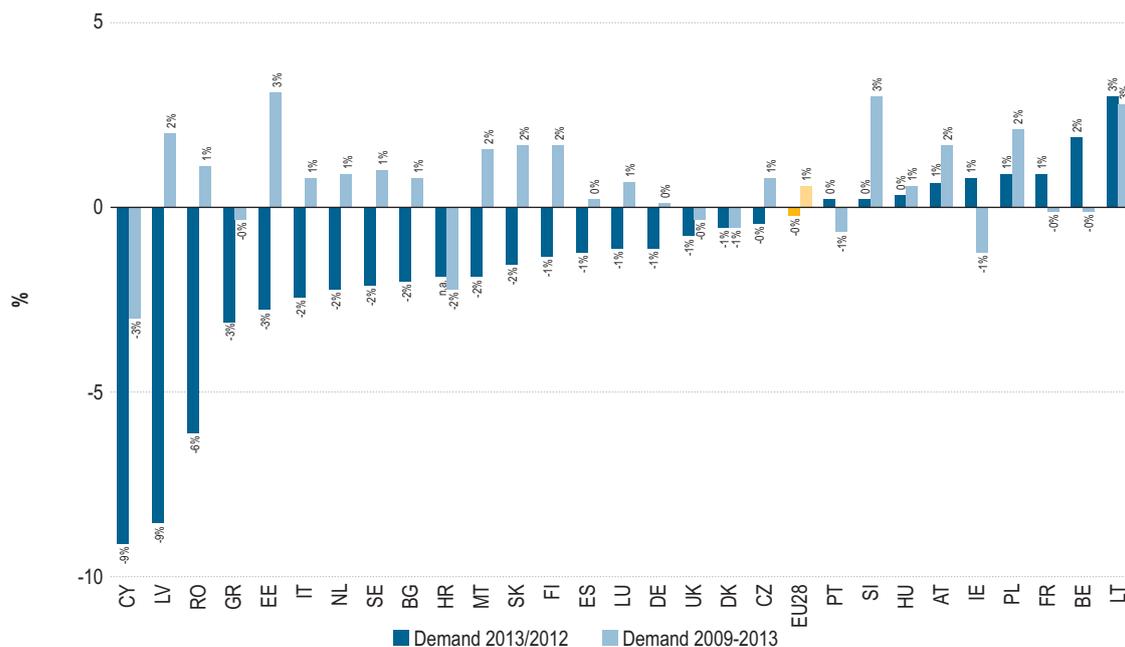
Note: Electricity availability for the internal market and Gross inland gas consumption.

- 10 However, the European electricity and gas market trends presented above are not consistent across all MSs. Consumption dynamics in different MSs have varied. This is partly dependent on the economic situation in specific MSs, which has affected industrial and household gas and electricity consumption. However, other reasons, such as the trend towards cheap coal as the fuel of choice for power generation as opposed to gas, the increasing penetration of RES, energy efficiency improvements and the weather all affected electricity and gas demand in 2013 (see the Wholesale chapter section 4.2).
- 11 As Figure 2 demonstrates, for a large majority of European countries, electricity demand fell compared to 2012. This contrasts with the 2009–2012⁸ period, during which almost all MSs witnessed modest demand growth.
- 12 Cyprus, Estonia, Greece, Latvia and Romania exhibited the sharpest drop in electricity demand by end consumers in 2013 compared to the previous year. In Cyprus and in Greece, the decline in electricity demand from 2012 to 2013 represents a continuation of the 2009–2012 trend in decreasing year-on-year demand, coinciding with the fall in both countries' GDP (-6.9% and -5.8%, respectively). In Latvia, electricity demand was affected (-8.6% compared to 2012) by the closure of one of Latvia's largest energy-intensive businesses in the metal industry, whilst in Estonia the demand reduction was probably affected by the unusually mild end of the year.

8 Measured by the Compound Average Growth Rate (CAGR). CAGR is calculated by taking the n^{th} root of the percentage of the year-on-year demand growth rate for the period analysed, where n is the number of years in the period being considered (in this case, the cubic root).

- 13 Compared to 2012, the demand for electricity in 2013 increased in eight MSs, the greatest increase being in Lithuania (3.0%). All countries in which there was an increase in electricity demand also experienced a rise in GDP in 2013 compared to 2012, with the exception of Ireland, which showed no year-on-year GDP change.

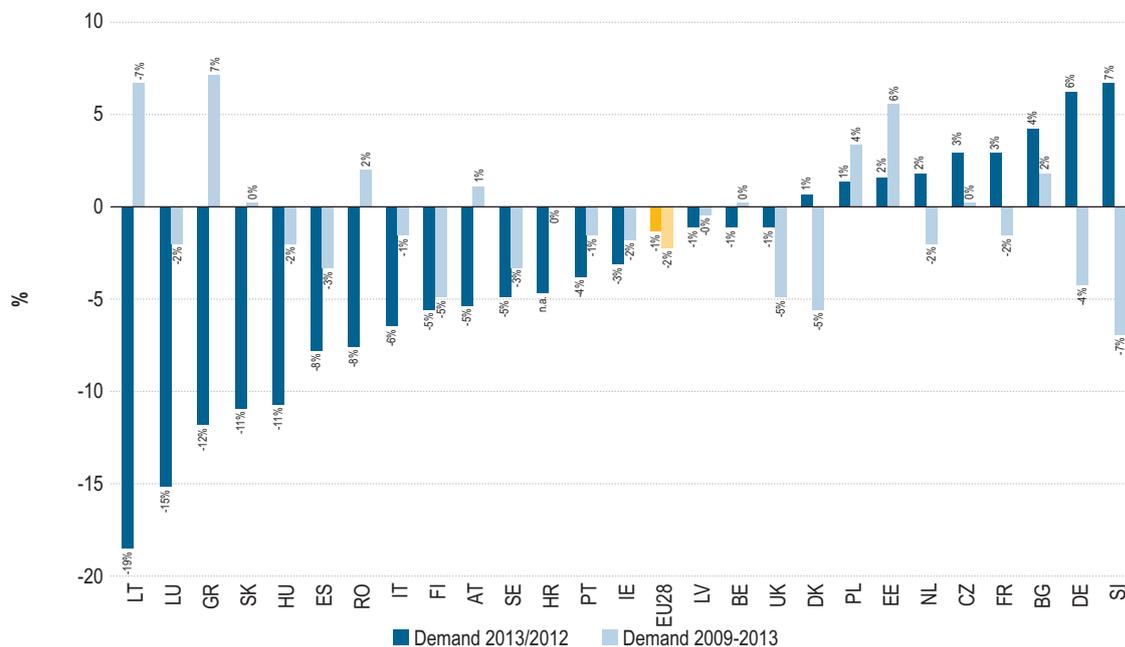
Figure 2: The change in electricity demand in Europe – 2012–2013 and 2009–2012 (%)



Source: Eurostat (10/7/2014) and ACER calculations

Note: Electricity available for the internal market. The information is based on Eurostat estimates for electricity demand, although it represents the supply of electricity to end users in the EU. Data for Portugal were revised based on information provided by ERSE (3/7/2014). According to CREG and RAE, Belgian and Greek electricity demand in 2013 declined by 1.3% and 2.2% respectively compared to 2012. According to ANRE, compound electricity demand growth from 2009 to 2012 was 1.7%, i.e. higher than presented.

Figure 3: The change in gas demand in Europe – 2012–2013 and 2009–2012 (%)



Source: Eurostat (10/7/2014) and ACER calculations

Note: Gross inland consumption. The information presents the sum of production, net imports and stock change. Eurostat data are provisional for some countries.

- 14 In 11 out of the 26⁹ MSs where gas is supplied, demand for natural gas in 2013 fell by more than 5% compared to 2012 (see Figure 3). This decline was most pronounced in Lithuania, Luxembourg, Greece, Slovakia and Hungary.
- 15 In Lithuania, in 2013, gas demand decreased compared to 2012 due to an increase in the consumption of bio-fuel and use of alternative-fuel boilers by household and non-household consumers. Gas demand in Lithuania was further affected by reduced electricity production quotas¹⁰.
- 16 In Greece, the decline in gas consumption correlates with the fall in GDP (-5.8%). In Luxembourg, the decline in gas demand was mainly due to the reduced activity of a combined-cycle gas turbine plant¹¹.
- 17 In Germany and Slovenia, the gas demand growth in 2012-2013 was not only the highest, but also represents a change in the trend of the 2009–2012 gas demand growth. In Germany, the 6.4% growth in gas demand was due to increased industrial output and a colder winter¹². In Slovenia, the 6.9% increase in gas demand corresponds to the increased output of thermal electricity power plants¹³.

9 No gas supply in Cyprus and Malta.

10 Electricity production quotas in Lithuania are supported through the Public Service Obligation (PSO) component which is included in electricity tariffs. Part of the PSO funding is devoted to supporting electricity production at the Lietuvos elektrinė power plant, which is needed to support the security of electricity supply and reserves for the functioning of the system. In 2013, the quota for electricity production by Lietuvos elektrinė was reduced from 1.53 TWh in 2012 to 0.9 TWh. The PSO funding also supports electricity production in the efficient combined-cycle power plants. The quota for efficient combined cycle power plants was reduced from 0.93 TWh in 2012 to 0.8 TWh in 2013. As a result of this, 2013 gas consumption fell by almost 100 million cubic metres compared to 2012.

11 In total, a reduction of approximately 2 TWh for all electricity producers and cogenerations. Source: ILR, Luxembourg.

12 According to DWD, the German meteorological service, the temperature was 0.7 °C lower in 2012/2013 winter compared to 2011/2012.

13 Source: Slovenian Statistical Office, http://www.stat.si/novica_prikazi.aspx?id=6024

- 18 Estonia's two-percent year-on-year gas demand growth in 2013 is relatively low compared to previous years, mostly due to the partial operation and then indefinite closure of the main fertiliser factory (AS Nitrofert)¹⁴.
- 19 Despite the high 8.1% GDP growth in 2013 compared to 2012, Romania experienced a decline in electricity and gas demand in 2013. The rise in Romanian GDP was mainly due to the non-energy-intensive automobile, textile and food industry. Furthermore, the rising Romanian prices and the anticipation of their continued rise are making household consumers increasingly aware of the savings to be made from limiting consumption and increasing energy efficiency. At the same time, similar to other countries, rising prices are steering industry towards energy-efficient investments that, in turn, have affected demand.
- 20 The stagnating 2013 electricity consumption and the declining gas consumption were further affected by an increase in electricity and gas prices for the most representative household and industrial consumer bands, as shown in Section 2.2.2.

2.2.2 Retail prices

- 21 This section presents a review of recent developments in energy retail prices in MSs across segments (i.e. households and industrial consumers) and between consumption levels.

2.2.2.1 Price differences between MSs and segments

- 22 In 2013, the post-tax total prices (POTP)¹⁵ for the electricity and gas supplied across Europe continue to vary greatly. Compared to the year before, EU-28 prices of electricity and gas for household consumers increased on average by 4.4% and 2.7%, respectively. In 2013, prices for electricity industrial consumers increased by 2.0% compared to 2012, while prices for gas industrial consumers decreased by 1.2%.
- 23 Average EU-28 electricity and gas unit POTPs are almost double for selected household consumer bands¹⁶ (20.01 euro cents/kWh for electricity and 6.54 euro cents/kWh for gas) compared to prices paid by industrial consumers (11.73 euro cents/kWh for electricity and 3.75 euro cents/kWh for gas). This is in line with the overall EU-28 final price levels observed for all household and industrial price bands¹⁷, displaying, with few exceptions, higher household and lower industrial prices (see paragraph (56)).

14 Source: Konkurentsiamet, the Estonian NRA.

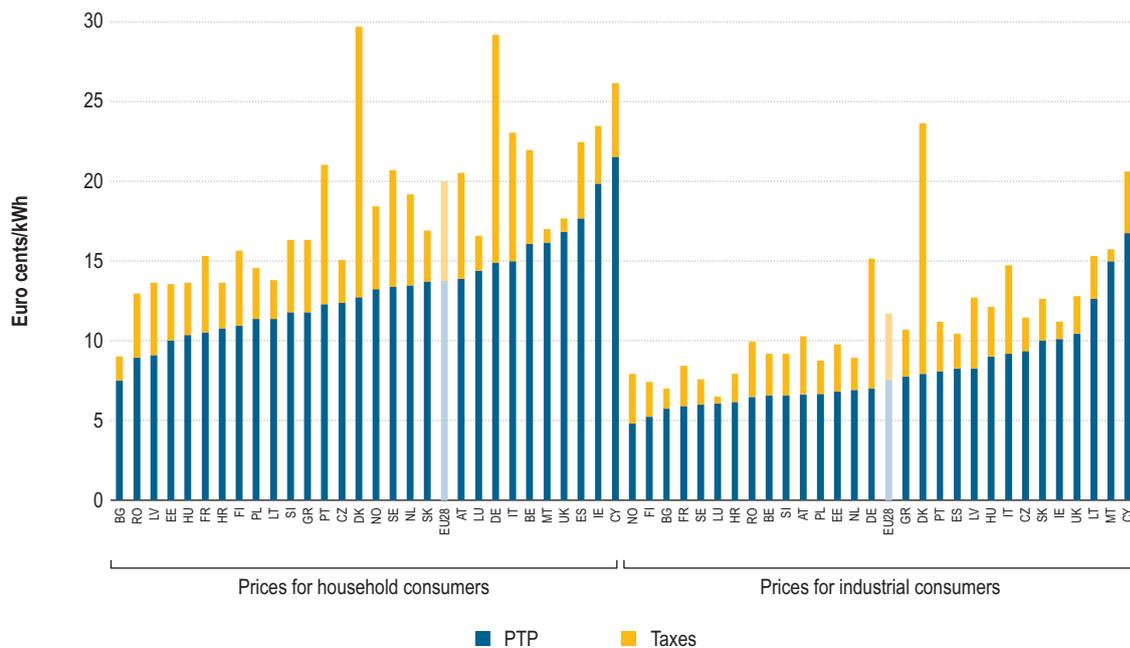
15 The post-tax total price is defined as the sum of the commodity price, regulated transmission and distribution charges, and retail components (billing, metering, customer services and a fair margin on such services) plus VAT, levies (as applicable: local, national, environmental) and any surcharges (as applicable).

16 The Eurostat yearly consumption bands referred to in this report are DC: 2,500-5,000 kWh (electricity households), D2: 20 GJ-200 GJ (gas households), IE: 20,000 MWh-70,000 MWh (electricity industrial consumers) and I5: 1,000,000 GJ-4,000,000 GJ (gas industrial consumers). While the analysis in this year's report shows prices for all consumer bands (see Figure i and Figure ii in Annex 1), the focus of the price break-down of electricity and gas industrial prices has changed. Based on stakeholder feedback, the prices reported for industrial consumers are those of a higher consumption band compared to the two previous MMRs. For some, however, (for example Portugal, Malta, Cyprus) the higher IE and I5 industrial consumer bands reported on this year are even more atypical than previously reported.

17 Electricity household consumers: DA: consumption < 1,000 kWh; DB: 1,000 kWh < consumption < 2,500 kWh; DC: 2,500 kWh < consumption < 5,000 kWh; DD: 5,000 kWh < consumption < 15,000 kWh; DE: consumption > 15,000 kWh. Electricity industrial consumers: IA: Consumption < 20 MWh; IB: 20 MWh < consumption < 500 MWh; IC: 500 MWh < consumption < 2,000 MWh; ID: 2,000 MWh < consumption < 20,000 MWh; IE: 20,000 MWh < consumption < 70,000 MWh; IF: 70,000 MWh < consumption < 150,000 MWh; IG: consumption > 150,000 MWh. Gas household consumers: D1: consumption < 20 GJ; D2: 20 GJ < consumption < 200 GJ; D3: consumption > 200 GJ. Gas industrial consumers: I1: consumption < 1,000 GJ; I2: 1,000 GJ < consumption < 10,000 GJ; I3: 10,000 GJ < consumption < 100,000 GJ; I4: 100,000 GJ < consumption < 1,000,000 GJ; I5: 1,000,000 GJ < consumption < 4,000,000 GJ; I6: consumption > 4,000,000 GJ.

- 24 The lower POTP price levels for industry compared to households – which most likely result from higher volumes of consumption, the possibility of large industrial consumers to negotiate lower energy prices, but also from lower non-contestable charges applied to industrial consumers – tend also to reflect the more developed role of liberalisation in the industrial segment¹⁸, which was in general deregulated earlier. This has enabled and enhanced market dynamics, resulting in – among other things – lower prices.
- 25 Household electricity prices in Denmark (29.68 euro cents/kWh), the MS with the highest household electricity prices, are more than three times higher than in Bulgaria (9.03 euro cents/kWh), the country with the lowest household electricity prices. Industrial electricity prices, too, are the highest in Denmark (23.65 euro cents/kWh), again more than three times higher than the lowest price paid by electricity industrial consumers in Luxembourg (6.52 euro cents/kWh) (Figure 4).

Figure 4: Electricity POTP and PTP¹⁹ for households and industry – Europe – 2013 (euro cents/kWh)



Source: Eurostat (10/7/2014) and ACER calculations

Note: Consumption bands: DC: 2,500-5,000 kWh (households) and IE: 20,000 MWh-70,000 MWh (industry). Within each group, MSs are ranked according to PTP.

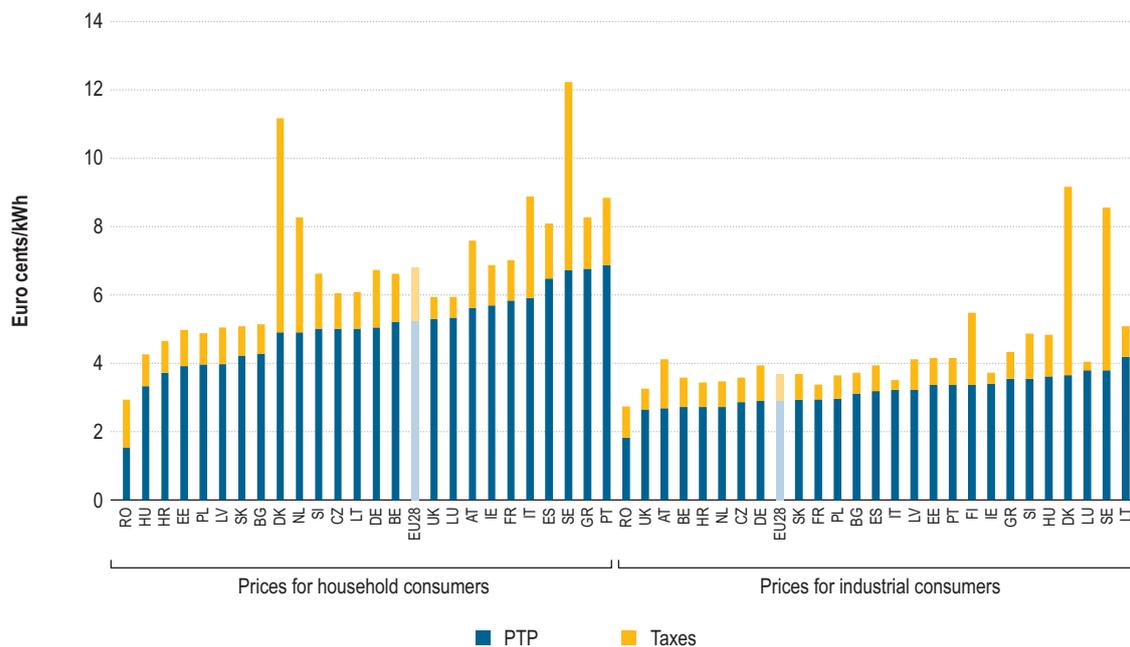
- 26 Household gas prices are lowest in Romania and Hungary²⁰ (2.96 and 4.26 euro cents/kWh respectively). Swedish and Danish industrial gas consumers, incurring considerable higher taxes and charges compared to other European countries, pay the highest gas prices in Europe (8.59 and 9.32 euro cents/kWh, respectively).

18 In the electricity industrial consumer segment, prices are higher in countries with price regulation (12.36 euro cents/kWh) than in liberalised countries (10.86 euro cents/kWh). In the latter, retail industrial electricity prices tend to be closely linked to the wholesale price. On the other hand, prices for gas industrial consumers are lower (3.53 euro cents/kWh) in countries with price regulation compared to liberalised countries (4.28 euro cents/kWh).

19 The pre-tax total price (PTP) is defined as the sum of the commodity price, regulated transmission and distribution charges, and retail components (billing, metering, customer services and a fair margin on such services).

20 Prices in Romania and Hungary have very low and negative mark-ups (See Section 2.3.2), indicating lower retail energy components compared to the relatively high wholesale energy price.

Figure 5: Gas POTP and PTP for households and industry – EU-28 – 2013 (euro cents/kWh)



Source: Eurostat (10/7/2014) and ACER calculations

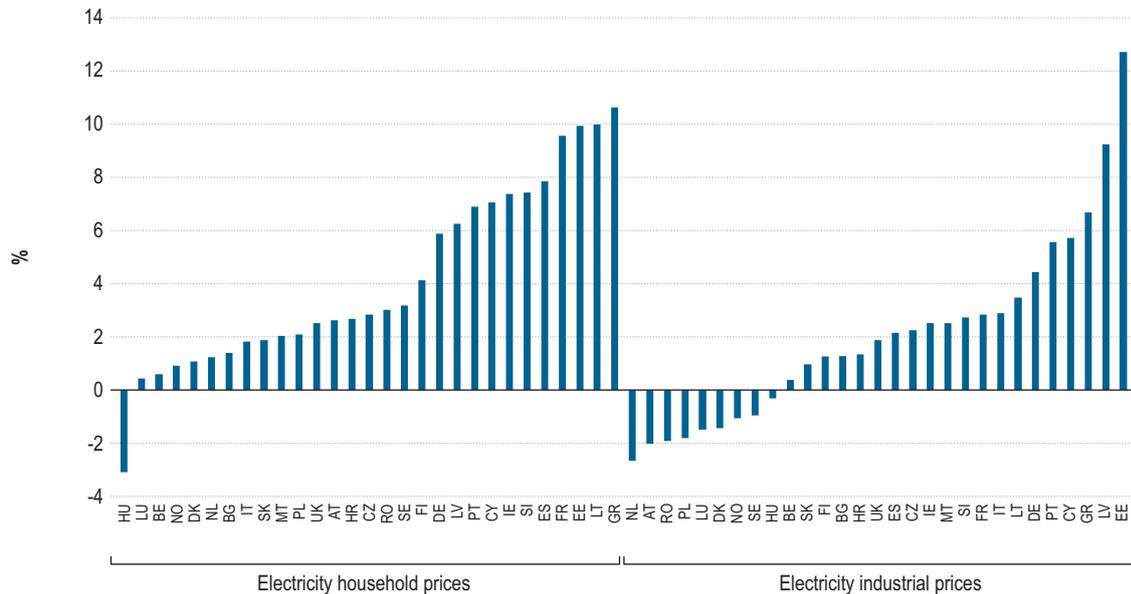
Note: Consumption bands: D2: 20 GJ-200GJ (households) and I5: 1,000,000 GJ-4,000,000 GJ (industry). Within each group, MSs are ranked according to PTP. Gas prices for Finnish households are not available. Due to the unavailability of data, prices for lower consumption band I4 (from 100,000 GJ to 1,000,000 GJ) are displayed for Denmark, Ireland, Lithuania, Luxembourg and Slovenia.

- 27 Differences across the EU-28 persist even at the Pre-Tax Price (PTP) level. The electricity PTP for households is highest in Cyprus (21.52 euro cents/kWh), which is almost three times higher than the Bulgarian PTP (7.53 euro cents/kWh). The electricity PTP for industrial consumers was highest in Cyprus (16.77 euro cents/kWh), whilst the Norwegian industrial electricity consumers paid more than three times less (4.85 euro cents/kWh).
- 28 As with the PTP comparison for gas consumers, the highest gas PTP was paid by Portuguese household consumers (6.90 euro cents/kWh), more than four times higher than the PTP paid by Romanian consumers (1.56 euro cents/kWh). Lithuanian gas industrial consumers (band I4) pay the highest PTP (4.20 euro cent/kWh) compared to 1.83 euro cents/kWh paid by industrial gas consumers in Romania, the country with the lowest industrial gas PTP price.

Changes in prices between 2008 and 2013

- 29 Figure 6 shows that prices for the selected electricity bands have increased significantly since 2008 in a large majority of European countries. The 2008–2013 compound annual growth rate (CAGR) for POTP household and industrial consumers shows an average increase of 4.2% and 2.0%, respectively.

Figure 6: The POTP compounded annual growth rate (CAGR) of household and industrial electricity prices – Europe – 2008–2013 (%)



Source: Eurostat (21/7/2014) and ACER calculations

Note: Consumption bands: DC: 2,500-5,000 kWh (households) and IE: 20,000 MWh-70,000 MWh (industry). Due to the unavailability of data, household price changes for France relate to the 2012–2013 period only, for Ireland to 2011–2013, for Cyprus to 2010–2013, and for Greece to the 2009-2013 period. Industrial price changes for France relate to the 2012–2013 period only, for Cyprus and Lithuania to 2010–2013, and for Ireland, Greece and Luxembourg to the 2009–2013 period. Price data for the 14 consumption band is presented for Lithuania.

- 30 Hungary was the only country in which household prices recorded negative growth in the period observed (CAGR of -2.6%). This was due to two government interventions that lowered the household regulated price by more than 20% in total. The regulated household price was initially reduced by 10% in January 2013. The system use, universal supply energy price and the renewable component²¹ were affected. The second reduction, of a further 11.1% of the total price, took place in November 2013. In this instance, in addition to a reduction in the system use and universal supply price, some of the taxes and levies (coal industry support, electric industry pensioners' support and district heating support) were reallocated to non-residential consumers, reducing the final price even further²².
- 31 Last year's report showed that the price of electricity for household consumers was highest in Cyprus (28.45 euro cents/kWh)²³. In 2013, the price dropped to 26.21 euro cents/kWh due to an intervention of the Cypriot National Regulatory Authority (CERA) that reduced electricity prices by approximately 8% by December 2013. In addition to this, the power plants which in were destroyed in June 2011 by an explosion at the Mari Naval Base became operational again in July 2013, increasing electricity generation and driving the average electricity price down²⁴.

21 The renewable charge was reallocated in a way that is subsequently only covered by consumers who are not entitled to universal supply (connection capacity exceeding 3 x 63 ampere).
 22 See the increase observed in the non-contestable part of the final electricity price for industrial consumers as a result of this in Figure 7.
 23 Prior to 2012, the Cypriot electricity household prices had grown fast i.e. with a compound average annual 2008–2012 growth rate of 10.5%.
 24 Source: CERA.

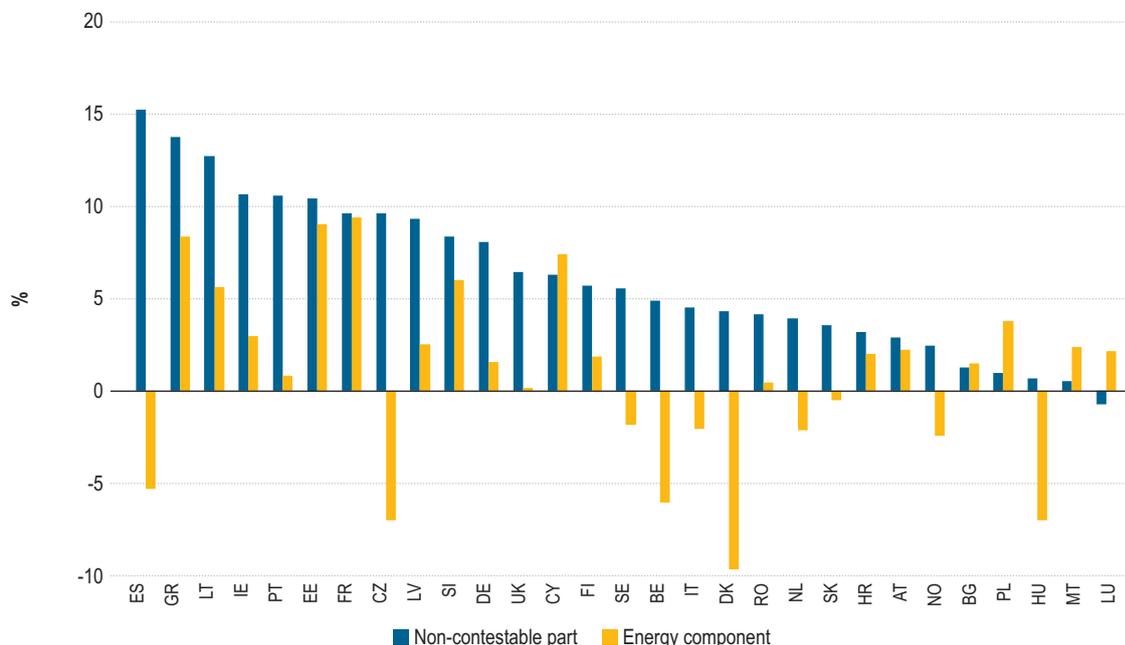
- 32 An analysis of the 2008–2013 POTP component growth in countries where final electricity household prices increased the most reveals that the final price growth was primarily driven by its non-contestable component (i.e. network charges, taxes and levies and VAT²⁵), as opposed to the energy component (see Figure 7)²⁶. The growth in the non-contestable component was most pronounced in Spain (15.3%), Greece (13.8%) and in Lithuania (12.7%). In Ireland, Portugal and Estonia, the non-contestable components grew by more than 10% in the period observed, pushing the final electricity price up more than in other countries (see Figure 7). These differences in the growth of non-contestable charges reflect the differences in national energy policies across the EU.
- 33 Estonia had the highest annual average 2008–2013 POTP growth in household prices. In addition to the increasing non-contestable charges, this is primarily due to the below-cost level of the energy component in the pre-2013 regulated price, which increased significantly after the removal of household price regulation in January 2013 (for more, see Case Study 5 in the Section 2.4.2 on End-user price regulation). Compared to 2012, the energy component of the incumbent's standard offer in Tallinn increased by 58% in 2013²⁷.
- 34 In Luxembourg, the Netherlands, Belgium, Italy, Denmark and Norway, among others, the relatively modest final electricity household price increases show energy component decreases and a low energy component price increase in the case of Luxembourg, as well as lower (i.e. less than 5%) increases in the non-contestable part (Figure 7).
- 35 Given the decline in wholesale electricity prices (see Section 3.2.1) in certain countries (for example, Germany, Ireland and the United Kingdom), some decrease in the retail energy component is to be expected (see Section 2.3.2). In these Member States in particular, the effect of the increasing non-contestable charges has been exacerbated by the failure of suppliers to pass on the savings resulting from reductions in wholesale prices to end consumers (see Section 2.3.2).

25 In countries in which the energy component price growth equals the non-contestable component growth, the growth in non-contestable components is most likely due to an increase in VAT as a variable tax on other components (energy, network and taxes and levies). However, in most countries, the VAT rate has not changed significantly during the period observed with some exceptions: Slovenia (from 20% to 22% in 2013), the Netherlands (19% to 21% in 2012), Spain (the first increase in 2010 from 16% to 18%, followed by another increase in 2012 from 18% to 21%), Ireland (from 21% to 23% in 2012) and Hungary (from 25% to 27% in 2012).

26 Estonia is an exception.

27 For 2013 data on offers, see Figure 9.

Figure 7: The compounded annual growth rate (CAGR) of the electricity energy component and the non-contestable part of POTPs for households – Europe – 2008–2013 (%)



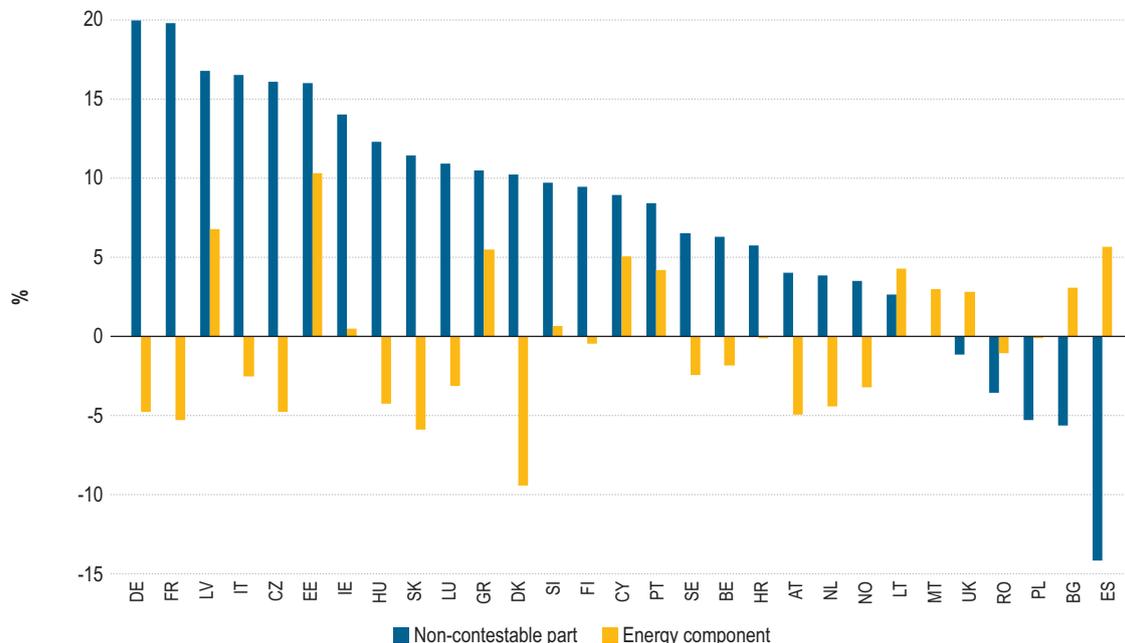
Source: Eurostat (21/7/2014) and ACER calculations

Note: Consumption band: DC: 2,500-5,000 kWh (households). Due to the unavailability of data, price changes for France relate to the 2012–2013 period only, for Ireland to 2011–2013, for Cyprus to 2010–2013, and for Greece to the 2009–2013 period. The energy component pricing data for Ireland, Italy, Lithuania, Portugal, Spain and the United Kingdom were corrected for some costs which are not purely energy-related (e.g. network losses, capacity payments, etc.) and which were originally included in the energy component.

- 36 The final 2008–2013 electricity price growth for industrial customers reveals the greatest diversity of all price changes (from a 2.7% decrease in average price growth in the Netherlands to a 12.7% increase in Estonia, due to the removal of price regulation in 2013, Figure 8). In those countries with the highest POTP growth in the period observed, namely Latvia and Greece, the price growth for industrial customers – as with household prices – was primarily driven by the growth in its non-contestable part (16.8% and 10.6% compared to the 6.8% and 5.5% growth in the energy component respectively)²⁸.
- 37 In Germany, the 20% increase in the non-contestable part of the POTP (compared to a 4.8% decrease in the energy component for industrial consumers) is most likely due to the RES charges. The same may be true of countries in which industrial consumers pay RES charges per kWh consumed, such as Greece, Croatia, Estonia and Portugal etc. (see Table A 3 in Annex 3), as opposed to countries in which large industrial consumers are at least partially exempted from covering RES charges (Norway, Poland and the United Kingdom).
- 38 In Austria, the Netherlands, Norway and Romania the energy component of the final price of electricity to industrial consumers decreased, and the non-contestable charges either decreased or remained broadly the same in 2013. These decreasing industrial electricity prices can be interpreted as a result of the trickle-down effect of a lowering in wholesale prices (see Section 3).

28 VAT and other recoverable taxes are included in non-contestable charges; however, being refundable, they are not incurred by the industry.

Figure 8: Compound annual growth rate (CAGR) of the electricity energy component and the non-contestable part of POTPs for industrial consumers – Europe – 2008–2013 (%)



Source: Eurostat (21/7/2014) and ACER calculations

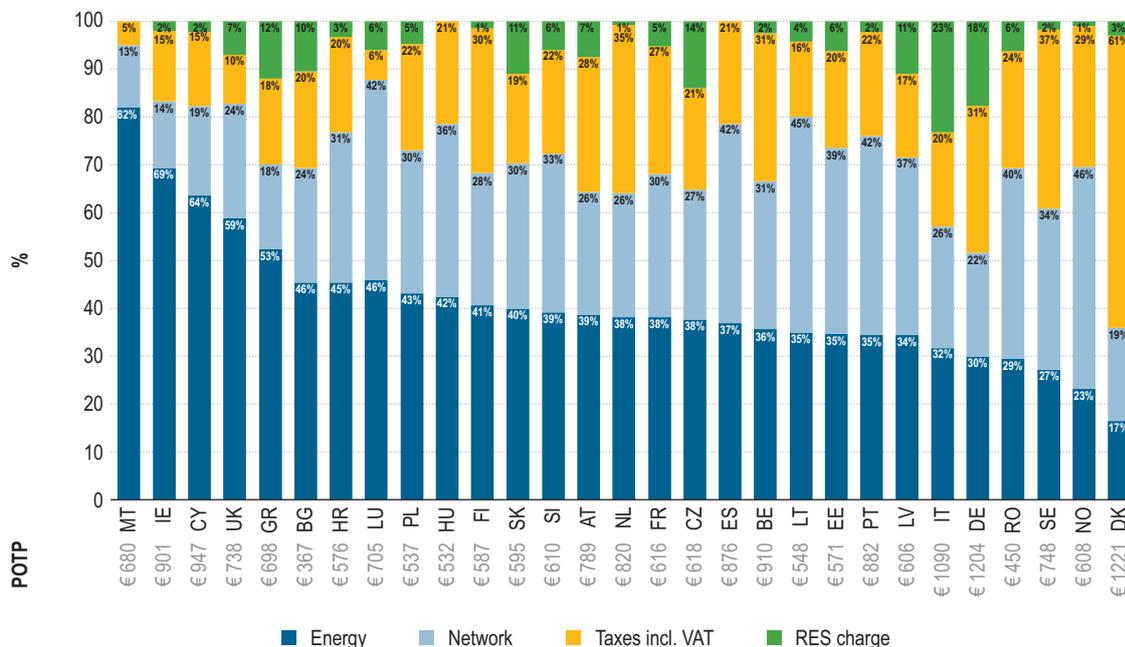
Note: Consumption band: IE: 20,000 MWh-70,000 MWh (industry). Due to the unavailability of data, price changes for France relate to the 2012–2013 period only, for Cyprus and Lithuania to 2010–2013, and for Ireland, Greece and Luxembourg to the 2009–2013 period. Price data for the I4 consumption band is presented for Lithuania.

39 In order to better understand price differences and the evolution of prices, the Agency continued to analyse the POTP break-down of standard electricity offers across the European capital cities as of December 2013.

40 Figure 9 shows that in all European countries except Cyprus, Greece, Ireland, Malta and the United Kingdom, non-contestable charges comprised most of the final price. Of these, network charges comprise the largest share in Norway²⁹ and Lithuania (46% and 45%), whilst in Denmark taxes and levies account for 61% of the final bill.

29 The incumbent standard offer in Oslo includes a network charge, which is a national weighted average network charge as opposed to the local distributor’s network charge. The reason for this is that Hafslund Nett AS (the distributor in Oslo) applies a much lower (non-representative) network charge of 159 euros for the specific consumption of 4,000 kWh annually. The Norwegian average in 2013 remained approximately the same as in 2012 at 282 euros.

Figure 9: POTP electricity break-down – incumbents’ standard offers for households in capital cities – November–December 2013 (%)



Source: ACER Retail Database³⁰ and information from NRAs (2013)

Notes: For some countries, the final price shown for the consumption of 4,000 kWh per household annually is not the most representative. For example, in Italy, the average consumption and the connection capacity are significantly lower (2,700 kWh annually and 3kW); in Romania, average consumption is approximately 1,500 kWh, in Lithuania 1,900 kWh annually. On the other hand, in Norway, Sweden and Finland, average demand is significantly higher than the average profile from the ACER Retail Database (over 16,000 kWh, 9,200 and 9,000 kWh, respectively). In the case of Denmark, the break-down refers to the average variable price in Copenhagen. In the case of the Swedish and Norwegian spot-based offers, the RES charge is estimated. In Malta, a charge for the support of the RES is not included in the electricity tariff, as the support for RES is financed through national taxes in the national budget. In Spain, RES support is included in the network tariff set by the government and has been estimated to amount to 18% of the final bill (The Spanish Ministry for Finance³¹); however, the cost allocation to the specific components for this item is not known to the NRA. In Romania, 2013 was the first full year for which the RES charge was explicitly recorded on the electricity bill. In the Netherlands, an explicit RES charge has only appeared on the electricity bill since 1 January 2013. For Portugal, RES includes a combined heat and power (CHP) charge.

41 The 2013 electricity break-down analysis shows that in those capital cities where the price of electricity increased the most compared to 2012, the increase was driven by the RES³² charges covering investments in renewable sources of energy³³: Romania (14% increase); Greece (10%); Lithuania (9%). Estonia is the exception, since it experienced an increase in the final bill of 22% due to an increase in the energy component of 58%³⁴. In Romania, the RES charge appeared separately on the bill during the whole year for the first time in 2013, accounting for 6% of the price paid by household consumers. In the capital cities of Greece and Lithuania, the RES charges increased by 119% and 44% compared to 2012.

30 ACER retail database is based on information from price comparison tools, NRAs and suppliers. It refers to offers for annual consumption of 4,000 kWh of electricity and 15,000 kWh of gas, which has been calculated as the average consumption for European household consumers based on Eurostat data. National consumption profiles might differ from the consumption pattern used. Fixed-, variable-, mixed-price and spot-based offers are included in the comparison.

31 Source: http://www.lamoncloa.gob.es/docs/refc/pdf/refc20130712e_1.pdf.

32 For more, please see the EC’s empirical evidence regarding the impact of RES penetration on retail prices (http://ec.europa.eu/economy_finance/publications/european_economy/2014/pdf/ee1_en.pdf).

33 RES charges, together with network charges and taxes and levies form part of the non-contestable components in the Eurostat data as presented in Figure 9.

34 Due to the already-mentioned removal of the regulated price, this was set beneath the market price in January 2013.

- 42 Although the 2013 RES charges increased significantly in the capital cities of Slovenia (by 72%)³⁵, Ireland (by 57%), Germany (by 47%) and Austria³⁶ (by 64%), their increase is offset by the decrease in the energy component (by -12%, -8%, -17% and by -3%, respectively), due to falling electricity wholesale prices (see Section 3 on the level of wholesale electricity prices).
- 43 Compared to 2012, the 2013 network charges for the distribution and transmission of electricity did not change significantly across the capital cities of Europe. The only exceptions were Denmark, Germany and Lithuania, where network charges increased by 22%, 18% and 15%, respectively.
- 44 In Germany, the total increase in the network charge in Berlin was based on a rise in the revenue cap for 2013 due to the grid-expansion on both the DSO and TSO levels. Similarly, the increase in the Copenhagen supplier's network charge was due to a shortfall in revenue from previous years³⁷.
- 45 Compared to 2012, the final price of electricity dropped the most for consumers in the capital cities of Cyprus (-17%), Hungary (-21%), Italy (-9%) and Belgium (-5%) (see Figure A 7 in Annex 4). As already mentioned, the price reduction in Cyprus and Hungary was the result of government intervention through household regulated prices; in Rome and Brussels, however, this was mainly due to the decrease in the energy component (-30% and -12% compared to the energy component of 2012). In Italy, RES charges comprising 23% of the final bill increased significantly (by 17% compared to 2012), reducing the net effect of the lower energy component on the final bill.
- 46 In Norway and Sweden, where offers tracking the wholesale price (i.e. the spot-based offers) are common, the change in the final bill was consistent with wholesale price trends and, consequently, the retail energy component change. In Norway, compared to December 2012, the final retail price based on offers from December 2013 decreased by 5% due to a 16% decrease in the energy component³⁸, whilst in Sweden the final price increased by 7% due to a 21% increase in the energy component. While it is true that for the months of November and December, the average wholesale price was lower in 2013 than in 2012, this was not true for the year as a whole.
- 47 From 2008 to 2013, gas prices for European household and industrial consumers grew on average by 4%.
- 48 Croatia experienced the highest price growth in gas for both household and industrial consumers (11.1% and 11.5%, respectively). In Hungary, which applies price regulation to household gas consumers, the annual year-on-year price growth was negative. This is due to government interventions in the pricing structure. Romania, too, exhibited a negative 2008–2013 compounded POTP annual growth rate. Prior to 2012, falling regulated gas prices were affected by falling consumption, generat-

35 This is the result of the increase in the RES tax (*prispevek za obnovljive vire energije [OVE]*) in February 2013. In addition to this, VAT was raised in July by two percentage points.

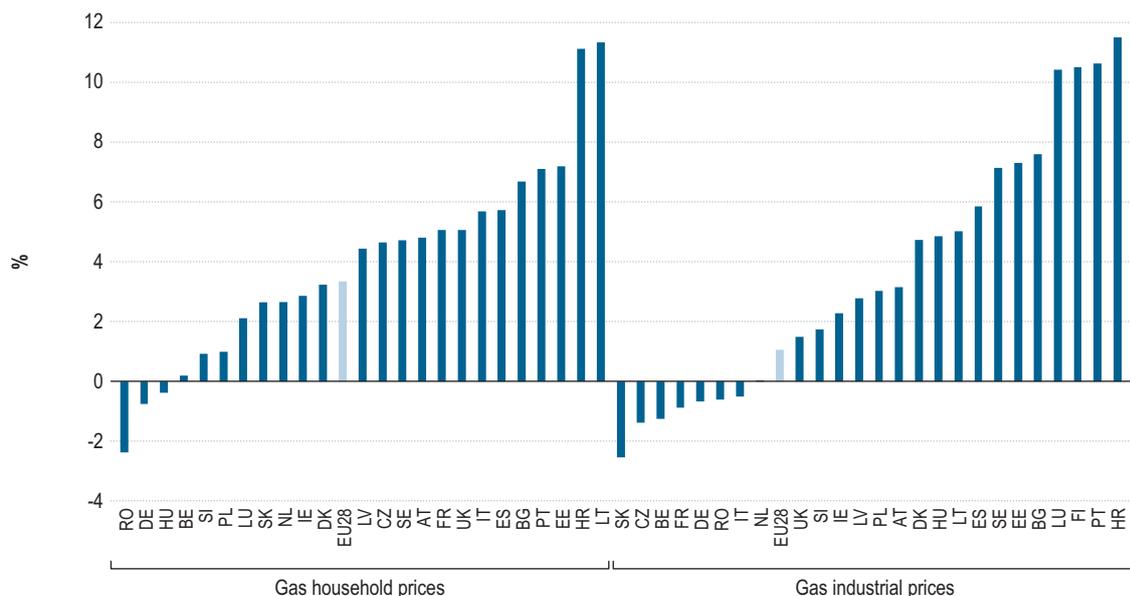
36 Since mid-2012, the RES charges have been covered through the network charge and are explicitly shown on the bill. Prior to that, however, suppliers passed on the RES-related charges to consumers i.e. included them in the energy component, which was not always explicitly shown.

37 Namely, companies are free to change tariffs every year; however, if an increase in the network charge is ten per cent or higher, it must be announced. The Danish regulator (DERA) manages the network charge regulation by revenue caps. The network charges can increase or decrease every year according to changes in the factors which affect the calculation of the revenue caps. A shortfall or cover from former years also plays a major part in the calculation of allowed revenue and thereby in the calculation of the network charge. Source: DERA.

38 This comparison is based on offers available to consumers at the end of the years 2013 and 2012 and may not be representative of the annual price changes. In Norway, for example, the December 2012 wholesale price was 42.56 euros/MWh compared to the December 2013 price of 32.46 euros/MWh. Norwegian average annual wholesale prices showed an opposite trend, with the average 2012 wholesale price of 29.56 euros/MWh increasing to 37.56 euros/MWh in 2013. See Section 3 on wholesale electricity prices. Source: Nord Pool Spot.

ing a reduction in (more expensive) gas imports and changing the ‘domestic-import’ gas mix. In 2013, however, gas prices for households and industrial consumers overall increased by 8.7% and 10.0%, respectively. This was an expected outcome of the roadmap for phasing out regulated prices, which began in 2012.

Figure 10: POTP compound annual growth rate (CAGR) of gas household and industrial prices – EU-28 – 2008–2013 (%)



Source: Eurostat (21/7/2014) and ACER calculations

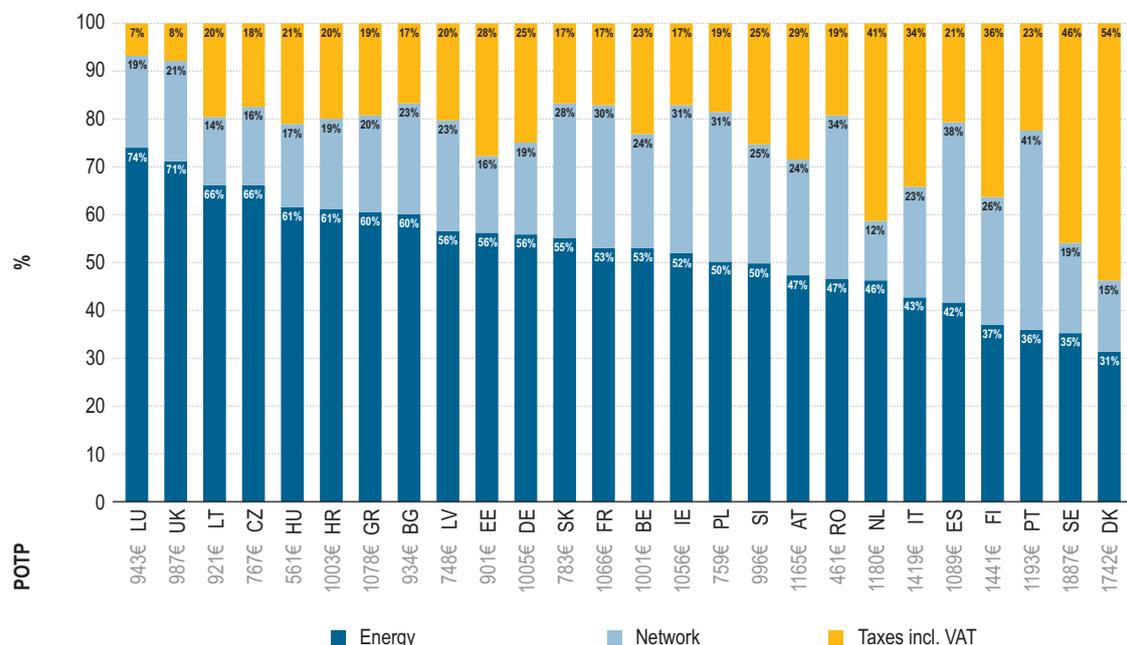
Note: Consumption bands: D2: 20 GJ-200 GJ (households) and I5: 1,000,000 GJ-4,000,000 GJ (industry). Within each group, MSs are ranked according to PTP. Household prices are not available for Greece and Finland. For Austria, due to the unavailability of the 2008 prices, 2009–2013 price growth is shown. In the case of Croatia, Denmark, Ireland, Lithuania and Slovenia, industrial gas prices for the lower band (I4: 100,000 GJ – 1,000,000 GJ) are shown.

- 49 Due to data limitations³⁹, a growth driver analysis similar to the one shown in Figure 7 and Figure 8 for electricity could not be performed. It is expected, however, that in countries where network charges, taxes and levies account for a significant share of the final price of the gas supplied (i.e. in Denmark, Sweden, Portugal, Finland, Spain etc. as shown in Figure 11), price growth can be attributed at least to some extent to the non-contestable part of final gas prices. In Denmark and Sweden, taxes and levies and network charges alone comprise 69% and 65% of the respective final prices. In Lisbon⁴⁰, network charges account for 41% of the final price, the highest in Europe.
- 50 In other 17 MSs (Figure 11), the energy component is still the most relevant component of the end-user price, accounting for more than 70% of the final price in Luxembourg and the United Kingdom.

39 The Eurostat prices do not provide a break-down of prices into the energy, network and taxes and levies components for the period observed.

40 This is due to the municipality-related taxes in Lisbon. As such, the remainder of Portugal differs.

Figure 11: POTP gas break-down – incumbents' standard offers for households in capital cities – November-December 2013 (%)



Source: ACER Retail Database and information from NRAs (2013)

Notes: The break-down refers to the average of all offers for the consumption of 15,000 kWh annually in the capital cities of the Netherlands and Germany. The natural gas prices for Sweden refer to a very limited area of the country. For some countries, the average consumption to which the offers refer is non-representative (for example, Portugal, where the typical consumer consumes from 220 to 500 m³ a year).

- 51 The analysis of the 2013 gas household offers compared to the year before shows that the final price decreased or remained the same in 15 out of 25⁴¹ MSs, in a majority of them due to a decrease in the energy component. The final price for gas supplied to households decreased most in Hungary (by -22%), due to government intervention in the regulated price (see paragraph 0, the re-negotiated wholesale price and the removal of the security stocking fee from the household bill since 1st January 2013, and in Belgium (-16%), following the decrease in the energy component by 25%. The energy reduction in the component was significant in Finland (-18%), Poland (-17%), Germany (-16%) and Luxembourg (-10%). It is to be noted that these decreases are assessed on the incumbent standard offers. These particular offers may have decreased due to competitive pressure from other market participants. The underlying reasons for some of these price decreases relate to re-negotiated import prices for natural gas (See section 4.3.2 for more detail).
- 52 The energy component also decreased in France (by -7%), Austria (by -3%) and in Slovenia (by -2%); however, this decrease was offset by increases in network charges by 15% in France and 9% in Austria. In Slovenia, the 10% increase in taxes and charges was due to the increase in VAT⁴².

41 Croatia was not reported on in 2012.

36 42 The RES charge which increased for electricity consumers in 2013 was newly introduced for gas consumers on 1 June 2014.

- 53 Compared to 2012, the final bill for natural gas consumption increased most in the capital cities of Portugal (by 5%), Romania (by 10%), the United Kingdom (by 8%) and Denmark (by 7%). While in Romania and Denmark the main driver of final price growth was network charges (by 12% and by 7%, respectively), the energy component increase of 10% pushed up the final price in the United Kingdom⁴³.
- 54 In Lisbon, the increase in the final price of gas supplied in 2013 compared to 2012 was primarily driven by an increase in the TOS⁴⁴ tax of 26% in the same period and by the increase in the energy component due to higher wholesale prices (6.5%)⁴⁵. Network charges also increased (by 3% compared to the year before), due to a decrease in gas consumption, which caused an increase in the distribution network cost per unit and, consequently, the increase in network charges.
- 55 In sum, retail prices in Europe have continued to increase overall, and for households more than for industrial consumers. The non-contestable charges tend to increase in particular in MSs, where this part of bills is already high. Increased network charges and subsidies for renewables are responsible for this.

2.2.2.2 Price differences between segments and consumption bands

- 56 On average, EU-28 prices across all bands for electricity and gas supplied to households (21.81 euro cents/kWh for electricity and 7.54 euro cents/kWh for gas) are higher than those supplied to industry (15.20 euro cents/kWh for electricity and 4.82 euro cents/kWh for gas) (see Figure A 5 and Figure A 6 in Annex 4 for specific price levels per band in MSs) due to the relatively larger volumes of electricity and gas supplied to industrial consumers compared to households. There are exceptions, however.
- 57 In Latvia, household electricity consumers pay 13.29 euro cents/kWh compared to 13.94 euro cents/kWh paid by industrial consumers. In Romania and Bulgaria, the difference between the average price of electricity supplied to households compared to a unit supplied to industrial consumers is less than one euro cent/kWh (9.09 and 12.98 euro cents/kWh for households compared to 8.61 and 12.31 euro cents/kWh for industrial consumers, respectively). As shown in Section 2.3.2, the respective countries' interventions in household regulated prices affect their mark-ups, which are negative.
- 58 Gas household consumers pay less per kWh of natural gas supplied than industrial consumers in Romania (2.94 compared to 3.06 euro cents/kWh)⁴⁶, Hungary (4.38 compared to 5.26 euro cents/kWh) and in Croatia (4.68 compared to 4.88 euro cents/kWh). In Estonia and Poland, the difference between the average price of gas supplied to households compared to a unit supplied to industrial consumers is relatively small (5.33 and 5.31 euro cents/kWh for households compared to 4.29 and 4.27 euro cents/kWh for industrial consumers, respectively).

43 The energy component increased in Bulgaria (by 5%), Sweden (by 4%) and Ireland (by 1%). In all countries the energy component of the final gas price decreased compared to 2012.

44 TOS – Taxa de ocupação de subsolo, charged by municipalities. The 2012-2013 increase in TOS refers to Lisbon only.

45 In addition to the increasing wholesale gas price, the retail energy component increases are due to the increases in transitory tariff. For historical reasons, transitory end-use tariffs are additive in global terms, but not by consumption level or by last-resort supplier. ERSE is progressively working on consumption level and last-resort supplier convergence, cautioning about significant tariff effects for consumers. As the standard consumer (4th consumption level in Lisbon) has a tariff below the additive tariff, ERSE applied higher increases than the national average in 2013, which is shown in the energy component.

46 In accordance with the roadmap for phasing out regulated prices, household prices are expected to increase by 2-3% per quarter by the end of 2014.

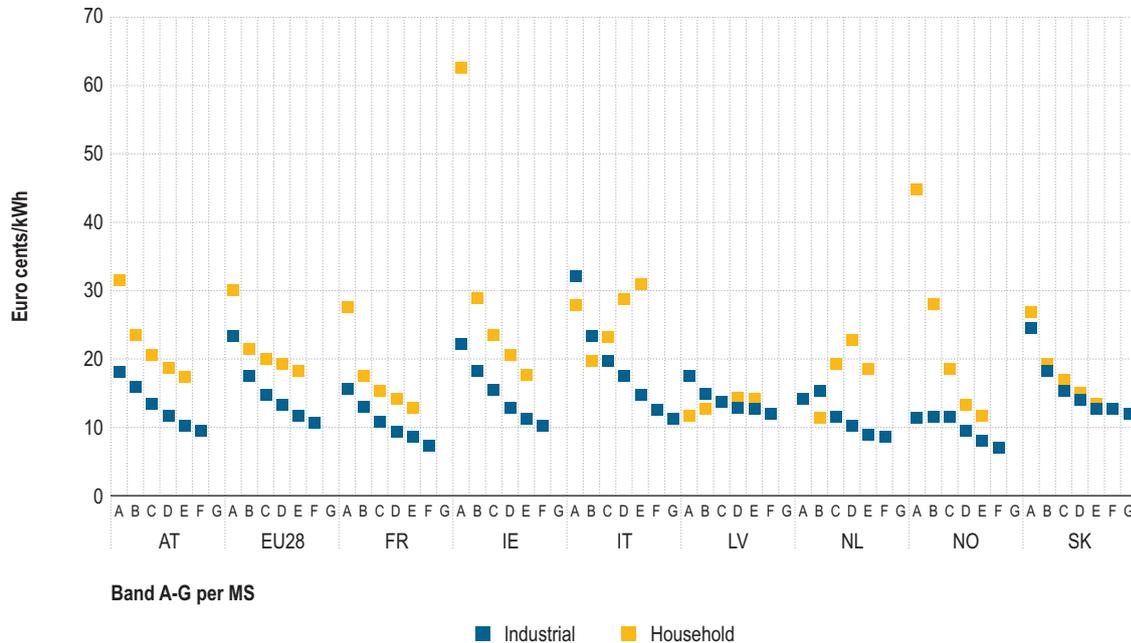
- 59 In addition to the observed differences in the average level of household prices compared to the level of industrial prices, lower consumption bands typically pay higher final POTP prices (Figure 12). Since the final price is affected by the price of energy and the capacity size of connection, which is expected to be progressive with increasing consumption, it can be argued that, in households too (as with industry), the level of electricity consumed (i.e. the 'volume' effect) plays a major role in determining the final price of energy across the EU. This effect is most pronounced in Ireland, where the end price per unit of electricity supplied (64.14 euro cents/kWh) to households consuming less than 1,000 kWh per year (DA) is more than double the price (29.87 euro cents/kWh) for households in the DB consumption band (consuming from 1,000 to 2,500 kWh annually).
- 60 Fixed standing charges are levied regardless of the amount of electricity consumed⁴⁷. As the consumption levels fall, these standing charges form a higher proportion of the costs, and result in higher average unit costs per kWh consumed within each band. In addition to the fixed standing charge, there is typically also a unit rate based on consumption⁴⁸ per kWh. In Ireland, there is a specific licence condition on electricity and gas suppliers prohibiting them from incentivising increased volume through tariffs⁴⁹.
- 61 A typical Norwegian household consuming on average 16,000 kWh annually (consumption band DE) pays 11.65 euro cents/kWh for the electricity supplied, i.e. significantly less than a household consuming on average 4,000 kWh annually (18.43 euro cents/kWh). Neither the fixed part of the household network charges, which is the same for all household consumers, nor the variable, consumption-dependent network charges, are generally capacity dependent, even though individual DSOs are allowed to differentiate the network charge based on capacity for household customers if they wish; however, not many do.

47 In Ireland for example, standing charges (and the PSO levy) are a flat rate per day/month and are the same for all consumption levels for domestic consumers, who all have a connection with a maximum import capacity of 29KVA. Band DA represents households that consume less than 1,000 kWh per annum, and accounts for just 1.3% of all electricity sold to households in Ireland. Typical consumers in this band in Ireland are possibly holiday homes that have consumption for a number of weeks per year, but incur full annual standing charges. Domestic distribution network charges are divided into two, urban and rural. A distinction is made to reflect the higher cost of installing and maintaining the distribution network in rural areas.

48 In France, these charges are also capacity-related.

49 Source CER: 'The licensee shall ensure that their tariffs for the supply of natural gas/electricity do not create incentives that may unnecessarily increase the volume of distributed or transmitted energy.'

Figure 12: Electricity prices for households and industry per band in a selection of countries – 2013 (euro cents/kWh)



Source: Eurostat (21/7/2014) and ACER calculations

Note: Electricity household consumers: DA: consumption < 1,000 kWh; DB: 1,000 kWh < consumption < 2,500 kWh; DC: 2,500 kWh < consumption < 5,000 kWh; DD: 5,000 kWh < consumption < 15,000 kWh; DE: consumption > 15,000 kWh. Electricity industrial consumers: IA: Consumption < 20 MWh; IB: 20MWh < consumption < 500 MWh; IC: 500 MWh < consumption < 2,000 MWh; ID: 2,000 MWh < consumption < 20,000 MWh; IE: 20,000 MWh < consumption < 70,000 MWh; IF: 70,000 MWh < consumption < 150,000 MWh; IG: consumption > 150,000 MWh. Results for other MSs and for gas are shown in Figure A 6 in Annex 4.

- 62 In Italy, Latvia and the Netherlands, however, connection capacity charges have a detrimental effect on the final electricity price formation: with the exception of some bands, electricity prices are lower for consumers with a lower connection, i.e. for those that consume less. Higher consumption, which necessitates a stronger connection capacity, is reflected in the network charges, increasing the price⁵⁰.
- 63 The ‘volume’ effect on the final gas price for household and industrial consumers appears to prevail across the EU-28, as final prices tend to drop considerably with increased consumption levels. Household price regulation appears to influence final price setting or the structure of the tariff in Bulgaria, Romania and Denmark, where no significant differences in the final gas prices can be observed for households consuming the least (i.e. less than 20 GJ annually; consumption band D1) and those within the highest household consumption band, D3 (i.e. consuming more than 200 GJ annually). In Hungary, Latvia, Luxembourg and Slovenia, the price of gas supplied to households in the middle- and high-consumption bands, D2 and D3, does not differ significantly, although their average level is lower than the price for gas supplied to small household consumers.

50 In reality, however, in both countries, higher consumption does not always mean a larger connection capacity and higher prices accompanying increased consumption. In the Netherlands, almost three million households supplied by Liander (the largest Dutch distribution system operator) have a small (3*25A) connection, while 17,000 have a larger (3*80A) connection. The average household consumption of Liander customers in 2012 was 3,331 kWh annually. Source: ACM.

2.2.3 Offers available to consumers

64 The data presented in this section⁵¹, which were collected from a range of price comparison tools across Europe, show a trend of existing suppliers diversifying their offers through competition parameters that are not exclusively price related⁵² to attract new customers and retain existing ones. To varying degrees, the price comparison tools systematically display the following characteristics of offers⁵³:

- the type of ‘fuel’ (electricity only, gas only, or dual-fuel offers);
- types of energy pricing (fixed, variable, spot-plus etc.);
- payment and billing possibilities⁵⁴ (direct debit, paper and e-billing);
- energy source (fossil versus renewable);
- the inclusion of additional services provided by the supplier to attract consumers, either against payment or gratis (meter reading, e-billing, insurance services, maintenance, supermarket points, gifts etc.); and
- other (customer post-switch satisfaction ratings).

65 Electricity and gas consumers in Amsterdam, Berlin, Copenhagen, Helsinki and Stockholm are free to choose from among the highest number of supplier offers, with on average 330 offers available from an average of 65 suppliers (see Table 1). Capital cities of countries applying regulated prices to almost all household consumers (Athens, Bucharest, Riga, Sofia, Vilnius) tend to show lower numbers of suppliers and offers⁵⁵, whilst countries in which regulated prices exist together with a relatively strong non-regulated market (Brussels, Madrid, etc.) tend to appear in the middle of the chart.

66 Although the number of offers available to energy consumers varies greatly from one capital to another, there are on average 70 electricity and 55 gas offers (from an average 23 and 15 suppliers, respectively) per capital city available to consumers through price comparison tools. In addition to this, significant (i.e. of more than 50 euros per year) price differences exist between the lowest and highest⁵⁶ electricity offers and between the lowest and highest gas offers in the majority of countries, especially in Brussels for electricity offers, and in the capital cities of Luxembourg, Germany, Sweden⁵⁷ and the UK for gas offers⁵⁸.

51 In total, almost 2,500 direct-debit, single-unit-rate offers for the selected electricity and gas consumption profiles of 4,000 kWh and 15,000 kW respectively in European capital cities were screened. Twenty European countries were analysed for electricity offers with regard to type of energy pricing, dual-fuel and green offers and free additional services (Bulgaria, Cyprus, Greece, Lithuania, Latvia, Malta and Romania are not included, as only one offer was obtained from their respective regulator, while in the case of the Czech Republic, Greece, Hungary and Slovakia, none of the categories was identifiable from the downloaded offers). In the case of gas offers, the analysis of all four categories was completed for 13 European countries (Estonia, Poland, Finland, Lithuania, Latvia, Bulgaria, Greece, Croatia and Romania are not included, as only one offer was obtained from the respective NRA or – in the case of Poland, from the supplier’s website – while in the case of Austria, Sweden, Slovenia and Slovakia, none of the categories was identifiable from the downloaded offers).

52 ‘Softer’ non-price elements (for example, a supplier’s brand name, location, type of ownership, whether foreign/home, private/public etc.) also affect consumer choice. However, these cannot be analysed in detail, since the screening of price comparison tools reveals limited results with regard to the ‘psychological’ aspects of the choice and popularity of the offer.

53 For an exhaustive list of the price comparison sites, see Annex 7.

54 Direct debit refers to a method of payment whereby a fixed or variable amount is taken from a bank account each month, quarter or year. Standard paper billing includes payment of the bill for the energy consumed or, if using a prepayment meter, for a set amount.

55 This is either due to the fact that no price comparison tools exist or because only a regulated price was provided by NRAs.

56 The highest and lowest 10% percentiles were excluded.

57 Offers downloaded for Sweden refer to a very limited area of Sweden – the Gothenburg area.

58 See Section 2.3.1 on price competition.

- 67 Table 1 presents the types of offer available and the number of suppliers providing them in each capital city. Product diversification varies among the European capitals, with the capitals of Denmark, France, Germany, Great Britain⁵⁹, the Netherlands, Spain and Sweden exhibiting several diversified products for electricity and/or gas consumers in addition to differently priced offers.

59 The United Kingdom in the case of gas offers.

Table 1: Electricity, gas and dual-fuel offers available to household consumers in capital cities – December 2013

Country	Electricity						Gas				
	Number of offers (suppliers)	Fixed offers (number of suppliers)	Spot-based offers (number of suppliers)	Dual fuel offers (number of suppliers)	Green offers (number of suppliers)	Free products or services (number of suppliers)	Number of offers (suppliers)	Fixed offers (number of suppliers)	Dual fuel offers (number of suppliers)	Green offers (number of suppliers)	Free products or services (number of suppliers)
AT	40 (25)	5(5)	0	0	23 (16)	5 (4)	15 (11)	0	0	0	0
BE	16 (6)	13 (5)	0	0	9 (4)	0	12 (5)	5 (2)	12 (5)	0	0
BG	1 (1)	0	0	0	0	0	1 (1)	1 (1)	0	0	0
HR	7 (5)	3 (1)	0	0	0	0	1 (1)	1 (1)	0	0	0
CY	1 (1)	0	0	0	0	0	0	0	0	0	0
CZ	61 (32)	4 (3)	0	0	0	0	24 (18)	9 (8)	2 (2)	0	0
DK	124 (23)	61 (17)	6 (4)	0	34 (9)	25 (23)	42 (10)	29 (10)	13 (9)	0	0
EE	14 (7)	0	0	0	4 (2)	0	1 (1)	0	1 (1)	0	0
FI	204 (43)	110 (35)	16 (14)	0	63 (20)	5 (2)	1 (1)	0	0	0	0
FR	29 (11)	10 (5)	0	7 (2)	10 (9)	1 (1)	19 (7)	13 (5)	0	0	1 (1)
DE	376 (146)	264 (103)	0	0	201 (107)	0	278 (97)	215 (91)	0	43 (15)	0
UK	59 (22)	32 (13)	0	39 (15)	8 (6)	15 (6)	88 (21)	48 (18)	61 (18)	0	29 (7)
GR	4 (4)	1 (1)	0	0	0	0	1 (1)	0	0	0	0
HU	4 (4)	4 (4)	0	0	0	0	4 (4)	2 (2)	0	0	0
IE	10 (3)	3 (1)	0	0	0	1 (1)	19 (4)	1 (1)	12 (3)	0	0
IT	30 (12)	23 (9)	0	1 (1)	6 (5)	6 (4)	27 (9)	22 (8)	5 (2)	0	1 (1)
LV	1 (1)	0	0	0	0	0	1 (1)	0	0	0	0
LT	1 (1)	0	0	0	0	0	1 (1)	1 (1)	1 (1)	0	0
LU	16 (5)	2 (1)	0	0	16 (5)	0	6 (3)	0	0	4 (2)	0
MT	1 (1)	0	0	0	0	0	0	0	0	0	0
NL	71 (25)	41 (13)	0	0	50 (20)	0	165 (22)	106 (20)	107 (22)	40 (9)	0
NI	22 (4)	12 (1)	0	0	0	0	0	0	0	0	0
NO	100 (35)	30 (22)	30 (21)	0	0	0	0	0	0	0	0
PL	77 (21)	29 (5)	0	0	0	1 (1)	1 (1)	0	0	0	0
PT	17 (5)	2(2)	0	6 (2)	1 (1)	7(1)	15 (4)	3 (2)	6 (2)	0	5 (1)
RO	1 (1)	0	0	0	0	0	1 (1)	0	0	0	0
SK	19 (19)	0	0	0	0	0	20 (13)	0	0	0	0
SI	36 (7)	22 (6)	0	0	5 (4)	5 (3)	27 (14)	0	0	0	0
ES	32 (19)	2 (1)	0	0	15 (7)	0	90 (6)	1(1)	45 (6)	0	7 (3)
SE	368 (91)	211(78)	89 (66)	0	206 (65)	0	16 (6)	0	0	0	0

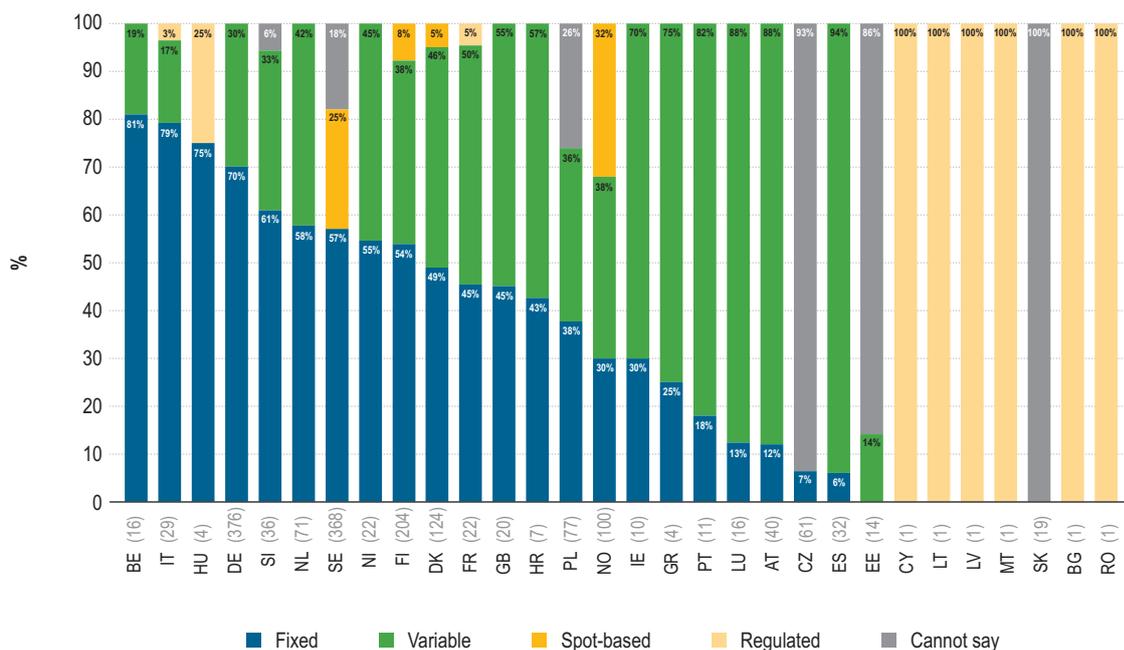
Source: ACER Database (November-December 2013) and ACER calculations

Notes: The data refer to capital cities, except for the Swedish natural gas offers, where the data refer to a very limited area of Sweden with an existing natural gas network – the Gothenburg area. The number in bracket refers to the number of suppliers offering electricity and/or gas of a certain type. Variable offers are not presented, as they tend to be offered as a default option. Fixed and spot-plus offers, however, exhibit signs of product differentiation from the supplier point of view. Only one electricity offer was obtained from the regulators of Bulgaria, Cyprus, Lithuania, Latvia, Malta and Romania. Although several electricity offers exist on the price comparison tools of the capital cities of the Czech Republic and Slovakia, none of the categories was identifiable from the downloaded offers. For Estonia, data concerning the type of offers is limited. For the gas offers of the Austrian, Swedish, Slovakian and Slovenian sites, none of the categories was identifiable. In the case of Sweden, the number of electricity offers included in the analysis reflect the offers of the most representative types on the price comparison tool offered by the Swedish suppliers, although the number of all offers is estimated to be higher than 600. The 16 gas offers from November-December 2013 included in the ACER database were collected through the suppliers' websites; however, as of September 2014, 24 gas offers were available to consumers in the same area. The number of dual-fuel offers in Amsterdam and Madrid offered to electricity consumers is estimated to be similar to the number of dual-fuel offers to gas consumers, i.e. higher than presented in the Table. For Athens, whilst four offers have been included in the analysis, there are five suppliers in total, offering six offers to electricity consumers. Loyalty cards and maintenance services are common in Madrid; however, offers containing these services do not appear in the Table, as they are usually offered against a fee. For Malta, Northern Ireland, Cyprus and Norway, information on gas offers was not collected. In Belgium, the United Kingdom and in Italy, dual-fuel offers to gas consumers labelled as green offer only green electricity. The numbers are highlighted in red for visibility. Dual-fuel offers do not appear in the price comparison tool included in this analysis; hence the number of dual-fuel offers shown is 0. According to E-Control, however, dual-fuel offers are offered by at least two suppliers.

2.2.3.1 Type of energy pricing as a differentiating element

68 One of the key, and the most consistently visible, aspects of offer diversification from the price comparison tools across Europe is the type of pricing of the commodity (i.e. fixed, spot-based, variable or regulated) in an analysed offer, hereinafter the ‘type of energy pricing’⁶⁰.

Figure 13: Type of energy pricing of electricity-only offers in capital cities as percentage of all offers – November-December 2013



Source: ACER Database (November-December 2013) and ACER calculations

Notes: The number next to the country code refers to the number of offers in the database. The above chart includes offers whose type of energy pricing could not be determined due to a lack of information on the price comparison tools (the capital cities of Slovakia, the Czech Republic, Estonia, Greece, Poland, Sweden and Slovenia). In Sweden, these types of offer relates to offers of suppliers of last resort, which are estimated to be mostly variable. The capital cities of Bulgaria, Cyprus, Hungary, Latvia, Lithuania, Malta and Romania show regulated prices only. The offer relating to the regulated price in Paris is variable. In Lisbon, some offers can be updated according to the changed network charges or according to the consumer price index. In Athens, the incumbent offer is fixed, whereas alternative suppliers include pool marginal price indexation, displaying variable offers therefore. One supplier offers a ‘package’ price i.e. a fixed price for consumption up to a certain level.

69 Fixed-price electricity offers prevail in Europe. In total, there are 851 electricity-only offers with a fixed-price contract and 666 variable-price offers, including spot-based offers. Fixed-priced offers are the most frequently listed on the price comparison tools for the capital cities of Portugal, Belgium, Italy, Hungary⁶¹ and Germany⁶².

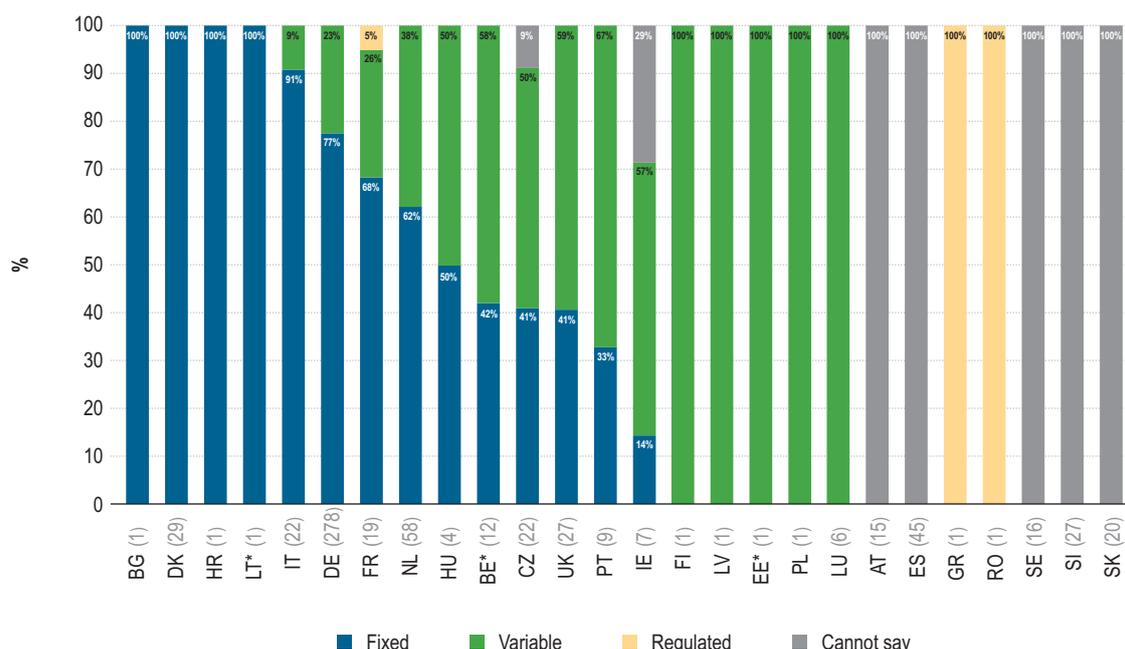
60 Fixed offers are offers that provide a fixed price of a commodity for a definite period of time, regardless of changes in the market price. Price comparison tools tend to show offers as fixed for a period longer than 12 months (the Nordic electricity market sometimes lists offers as fixed, even if the period is six months only). Variable offers are based on a commodity price that varies according to the market price for that commodity. In electricity, there exists a sub-type of variable-priced offers which is called ‘spot-based’ (or sometimes ‘spot-plus’). This sub-type of variable offers, which seems to appear only in the Nordic electricity market, is shown separately in our analysis as ‘spot-based offers’. The price of a spot-based offer is composed of the wholesale price of electricity plus a supplier margin.

61 Only 4 offers are included in the tool for Hungary.

62 Although the number of fixed offers is high in Germany, in reality the recently increasing charges (for example, the RES charge) are considered to be a unilaterally introduced change in the contractual arrangement by the supplier on the basis of which the consumer may terminate the contract. The legal basis for this is Section 41(3) of the Energy Industry Act: http://www.gesetze-im-internet.de/enwg_2005/_41.html.

70 Variable-price offers prevail in the capital cities of Croatia, Ireland, Luxembourg, Norway and Spain. Spot-based offers appear only in the capital cities of the Nordic countries⁶³. In Norway, approximately one third of all offers in the capital city are spot-based offers, and more than half of the customers in Norway have an electricity contract that follows the spot price directly. On 1 January 2013, there were 900 customers in the Oslo area with an incumbent fixed-price contract, whilst more than 91,000 customers took the incumbent spot-based offer.

Figure 14: Type of energy pricing of gas-only offers in capital cities – November–December 2013



Source: ACER Database (November-December 2013) and ACER calculations

Notes: The number next to the country code refers to the number of offers in the database. In Austria, Luxembourg, Slovakia, Slovenia, Spain and Sweden, the type of offer could not be determined from the price comparison tool, while this is partly true for the offers in Ireland and the Czech Republic. For Sweden, the distribution of 24 offers per type of energy pricing as of September 2014 shows the following gas offer types: 54% fixed, 25% variable and 21% unknown. The same distribution is assessed to have applied in 2013. One offer of an unknown type of pricing each relates to the regulated price in France, Greece and in Romania was obtained from the regulator. In Lisbon, one offer of an unknown type is a transitory price, which may vary quarterly. In the case of Belgium, Estonia and Lithuania, all offers obtained are gas dual-fuel offers (*).

71 Similarly to electricity offers, gas offers tend to be of a fixed-price character⁶⁴. Of the 468 gas-only offers, 339 were fixed-price contracts and 136 were variable-price contracts. Taking into account only those capital cities for which more than one gas offer was obtained, fixed gas-only contracts seem to prevail in the capital cities of Denmark, France, Germany, Italy and the Netherlands. In Brussels, Dublin and London, more variable- than fixed-price contracts are offered to gas consumers.

63 The reasons for this could be related to earlier liberalisation, a liquid day-ahead market and consumer trust in wholesale price formation.

64 Relates only to offers from the price comparison tools where the type of energy pricing of offers is available. It does not include regulated prices.

2.2.3.2 Other elements of offer diversification

72 Among the most frequently displayed differentiators of offers in price comparison tools are: (a) green sources of energy; (b) additional free services offered to consumers; and (c) the option to choose a dual-fuel offer.

a) Green sources of energy

73 The percentage of offers labelled as ‘green offers’⁶⁵ across the EU is high.

74 In a majority of capital cities where price comparison tools exist, electricity consumers can choose at least one green offer⁶⁶. In the capital cities of Austria, Belgium, Germany, Luxembourg, the Netherlands and Sweden, more than half of the electricity offers are green (see Table 1). In Luxembourg, all electricity offers are 100% sourced from green electricity production and four out of six gas offers are green, which is the highest percentage of all European countries with green gas offers.

75 Gas green offers are available in only three out of 17 countries where price comparison tools exist. In addition to Luxembourg, green gas offers are available only in Berlin and Amsterdam. Less than 1% of gas in the EU is produced from landfills, so green gas offers cannot be as common as in electricity. In Brussels, Rome and in London, gas dual-fuel offers are labelled as green; however, they offer only green electricity, not gas.

b) Additional free services offered to consumers

76 A large majority of offers provided through the price comparison tools of the different countries are commodity-only offers, either single- or dual-fuel. In several countries, however, in addition to the commodity, information exists on suppliers offering additional free tangible and intangible services that are substantial enough to attract consumers to a specific offer. Such services typically include:

- Electricity or gas offers with free intangible ‘teasers’ (i.e. supermarket points or similar, air miles, gifts in kind); and
- Electricity or gas offers with free tangible services such as insurance, boiler maintenance, home insulation, etc.

77 In the capital cities of Portugal, Denmark, Great Britain and Italy, more than 20% of all electricity offers include additional services, while in Vienna and Ljubljana offers with complimentary services represent more than 10% of all offers. The additional free services appear to be offered as teasers for consumers, in most countries, however, the offered price of energy through contracts including free services tends to be higher than the average price of energy offered through offers without free additional services⁶⁷.

65 Although several interpretations exist as to the percentage of energy sourced from renewable resources, an offer is defined as ‘green’ if 100% of the electricity production comes from green sources or – in the absence of information on the percentage of electricity production from green sources – if it is labelled as such by the price comparison tool. Against expectations, there is no significant correlation with the green offer and the so-called green energy price premium charged for green offers. Green electricity offers are significantly different only in Brussels, while in other capital cities where such an analysis could be performed, they not only appear to be only slightly more expensive than the non-green offers (Copenhagen, Paris, Rome, Ljubljana), but even cheaper (Berlin). For more details, see Section 2.3.2 on non-price competition.

66 Due to the limited information available for countries with regulated prices, and in some cases due to a lack of information on price comparison tools, it is impossible to draw conclusions on the number of green offers available in countries where RES charges are particularly high, such as Bulgaria, the Czech Republic, Greece, Portugal and others.

67 Therefore, it could be claimed that the ‘free’ additional services were not free. Based on ACER database of offers.

- 78 The type of free additional services offered to electricity consumers varies. In the capital cities of Great Britain, Ireland, Italy and Slovenia, additional supermarket loyalty-card points are granted to new customers. In Madrid, loyalty points are common, and maintenance is guaranteed to consumers on some offers, but at additional cost, while in Vienna and Copenhagen, free services include discounts on specific products or services for new consumers. In Helsinki, several offers provide a chance to win a product of a high monetary value. In Lisbon, additional free services relate to discounts offered to consumers shopping at selected retailers.
- 79 Compared to the electricity offers, gas offers less frequently include free additional services. In London, 29 out of 88 gas offers include free additional services such as supermarket loyalty cards, gift vouchers, charity donations and interest rewards on credit balances. In Madrid, 7 out of 90 gas offers include repair services, while various discounts are offered to consumers in Lisbon. One gas offer in Rome includes reward points as an additional free product to gas.

c) Dual-fuel offers⁶⁸

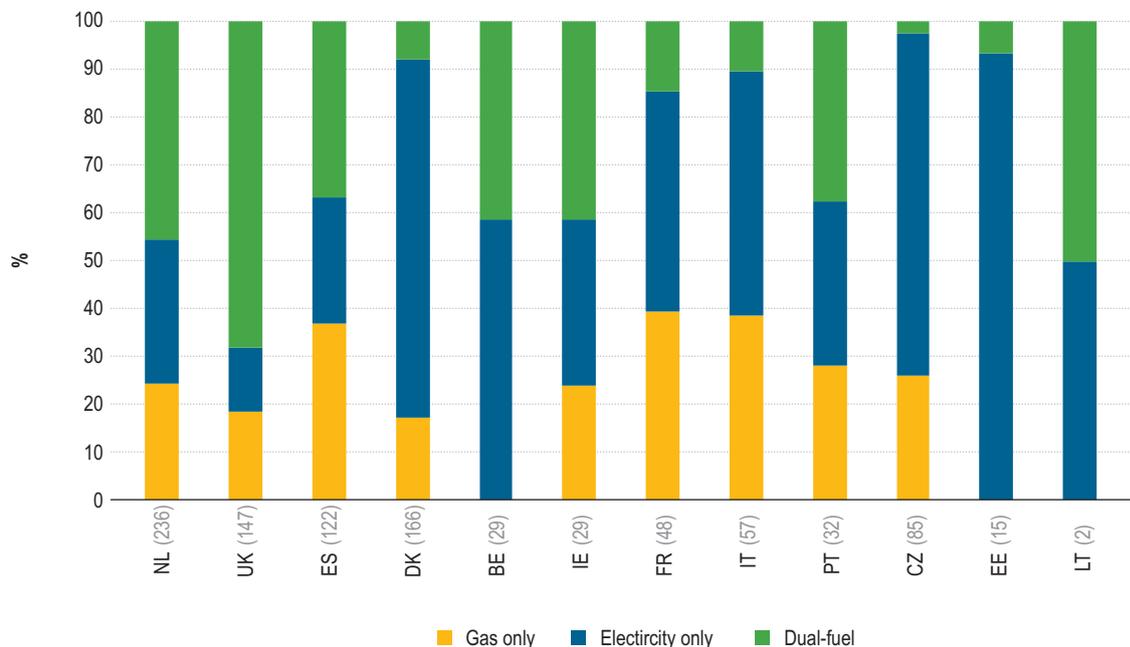
- 80 Dual-fuel offers prevail in countries with a traditionally higher consumption of gas⁶⁹. In London, more than 50% of all offers available to electricity and gas consumers are dual-fuel offers. In the capital cities of the Netherlands, Spain and Ireland, almost half⁷⁰ of all offers on the market are dual-fuel offers. In Brussels, all offers for the supply of gas are dual-fuel offers.
- 81 Gas dual-fuel offers are lower in price than single-fuel offers. While in London, for example, a dual-fuel offer for gas is on average 6% cheaper than the single gas offer, this is not the case for electricity dual-fuel offers, which seem to be slightly more expensive than single electricity offers in London. For further details on the price differences of single- vs. dual-fuel offers, see Section 2.3.2 on non-price elements.

68 Dual-fuel offers include offers for the supply of electricity and gas of a specific profile. A dual-fuel offer may be offered to a consumer of electricity for electricity and gas (an electricity dual-fuel offer), or to a gas consumer for the supply of gas and electricity (a gas dual-fuel offer).

69 The information is based on offers from price comparison tools which may sometimes not show dual-fuel offers.

70 In the Netherlands and Spain, the number of dual-fuel offers to electricity consumers is estimated to be higher than captured in the analysis shown. In the Netherlands, in particular, approximately 80% of all households are supplied through dual-fuel contracts. Although dual-fuel offers do not appear in the Austrian price comparison tool – according to E-Control – at least two suppliers offer them in Austria.

Figure 15: Share of dual-fuel offers in the total number of offers for a selection of countries where dual-fuel offers exist – 2013 (%)



Source: ACER Database (November-December 2013) and ACER calculations

Notes: The number of dual-fuel offers in the Netherlands and Spain offered to electricity consumers is estimated to be similar to the number of dual-fuel offers to gas consumers, i.e. higher than captured in the analysis.

82 The commodity price in an offer is only one element determining price. Other elements also tend to be widely apparent across the European price comparison tools. When it comes to displaying the differentiating elements of an offer that is designed to attract consumers to buy the commodity from a specific supplier, there seems to be a) more ‘offer diversification’ for electricity consumers and b) a difference in the level of this diversification for some countries compared to others. A large majority of capital cities including the capitals of the Netherlands, the UK, Denmark, Italy and Spain can overall claim to provide more diversified offers to consumers with regard to different types of energy pricing, type of fuel, source of energy or additional services. The capital cities of Ireland, France, Germany and Norway also show some diversity in terms of the price elements of offers that are not exclusively price related. In other markets, the diversity of offers is either limited, non-existent or cannot be assessed. The impact of consumer choice data on consumer switching and competition is assessed in what follows.

2.3 The level of competition in retail electricity and gas markets

- 83 This section provides a review of the level of retail competition across Europe. It first assesses supply side competition levels by analysing both price and non-price competition factors, and then turns to the demand side to evaluate consumer switching behaviour. The analysis aims to evaluate the impact of competition levels on retail price formation, and particularly why the energy component of the final consumer price still varies significantly from country to country.
- 84 To address these questions, the section explores the evolution of a range of market competition indicators between 2008 and 2013. The indicators assessed are: market concentration levels, market entry/exit levels, mark-ups, the relationship between wholesale and retail energy component prices, price dispersion, switching activity and consumer experiences. The interrelations of these indicators are also analysed.
- 85 The reasoning behind the selection of these indicators is that the higher the number of competing suppliers in a market (assessed from concentration and market entry indicators), the smaller retail margins should be (mark-up indicators). In the presence of competitive and liquid wholesale markets – and assuming no barriers to entering markets – retail prices are expected to have a closer relationship with wholesale market prices (assessed through the evolution of wholesale and retail price indicators). Price dispersion levels may provide a measure of the level of price competition among suppliers and on the maturity of the market. Additionally, switching rate indicators will serve to indicate which competitive phase a market is in and how consumers respond to competition⁷¹.

2.3.1 Market structure

- 86 Different types of competition may arise as a result of different market structures. This sub-section considers some of the issues related to the structure of electricity and gas retail markets by looking at how concentrated markets are at national level, entry and exit activity and at the degree of market consolidation at the European level.

Market concentration

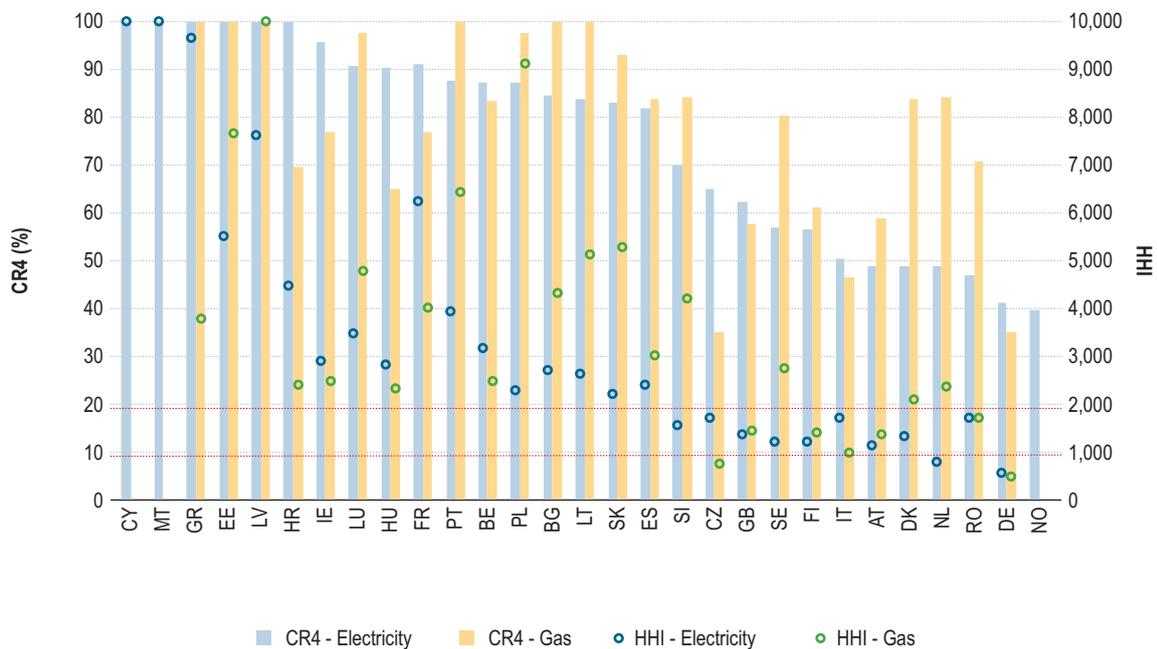
- 87 The level of concentration is an important indicator of a market structure. In general, a high number of suppliers and low market concentration indices are seen as indicators of competitive markets. Figure 16 illustrates the level of concentration of European retail markets at the national level⁷² in 2013, expressed both as the sum of the market shares of the four largest suppliers in a market (i.e. the CR4) and using the Herfindahl–Hirschman Index⁷³ (HHI). CR4 and HHI are the most commonly used measures of market concentration.

71 Higher values of entry and switching suggest a more competitive market phase; meanwhile more stabilised values may indicate that the competition is stable or that entry and that competition barriers may exist.

72 The multiple numbers of suppliers reported in this section at national level may disguise the fact that at the regional or at distribution level in an MS, consumers may have more, but also a very limited number of, suppliers to choose from, or in some cases have no choice at all. However, for the purpose of this report it is not necessary to define the relevant geographical and product market.

73 The HHI is calculated by adding the sum of the squares of the market shares of the firms in a particular market. The HHI can range from 0 to 10,000, where 0 indicates very low concentration and 10,000 indicates the presence of a complete monopoly. Horizontal red lines show HHI of 1,000 and 2,000 as per the European Commission's guidelines; a market can be regarded as concentrated if its HHI is above the 1,000 level, and highly concentrated if it is above 2,000.

Figure 16: Market concentration in retail electricity and gas markets – 2013 (% and HHI)



Source: Datamonitor's data (2014) and ACER calculations

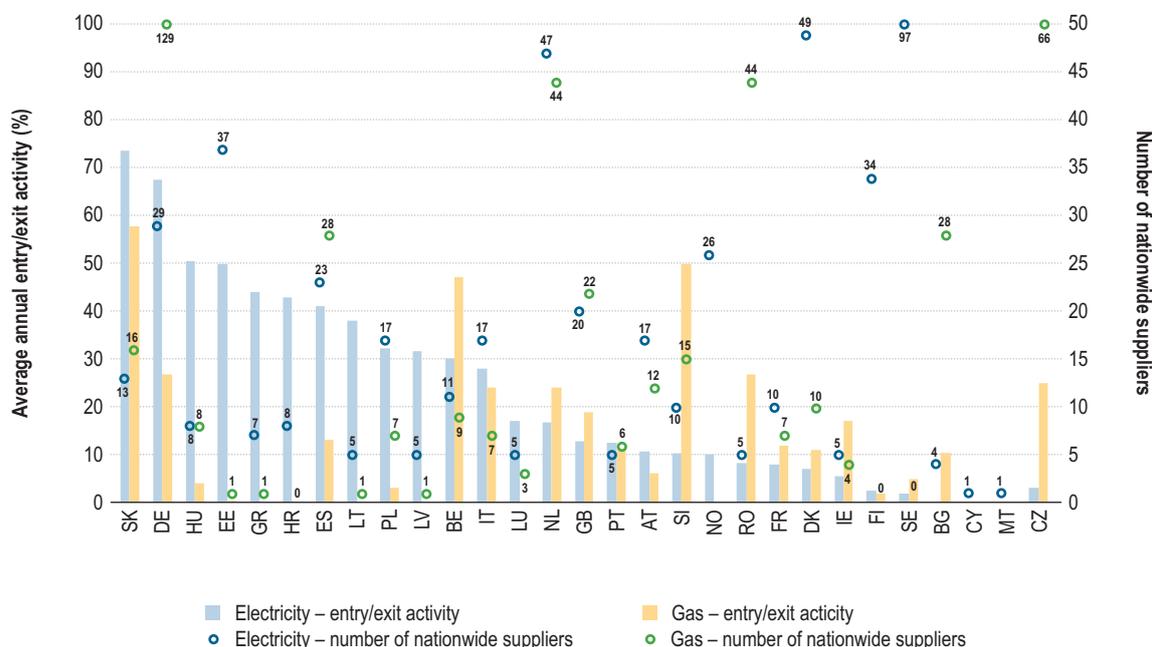
Note: According to the Dutch regulator ACM, CR4 data for the Netherlands is different: i.e. electricity: 85.8%, gas: 83.8%.

88 The figure clearly shows the persistence of very high concentration indices at the national level. The cumulative market shares of the four largest suppliers are more than 75%, and HHI is above the 2,000 level in many countries. The high level of concentration indicates that retail competition in many countries is still not well developed, a factor often used by national authorities to justify retail price regulation.

Entry and exit activity

89 Figure 17 shows the entry and exit activity and the number of nationwide electricity and gas suppliers in the various countries at the end of 2013, and therefore provides further insight into the structure of the market.

Figure 17: Entry/exit activity in the household retail market (5-year average – 2009–2013) and number of nationwide household suppliers in 2013 (% and number of suppliers)



Source: CEER National Indicators Database (2014)

Notes: Darker shades of blue and yellow bars indicate that the number of active nationwide suppliers is decreasing. To make the graph clearer, the right-hand scale (number of nationwide suppliers) is limited to 50.

- 90 Entry and exit activity has been assessed as the percentage of net new suppliers in the market in a given year in comparison with the total number of existing suppliers. For each year, absolute values⁷⁴ have been used to calculate the indicator on a five-year average basis.
- 91 The data show that over the last few years, several countries registered significant entry/exit activity into household markets (e.g. Slovakia, Germany, Hungary, Estonia and Greece in the electricity household market, and Slovakia, Slovenia, Belgium and the Czech Republic in the gas household market). In a number of MSs (e.g. Bulgaria, Cyprus, Estonia and Malta in the electricity household market, and Poland, Luxembourg, Lithuania, Latvia and Greece in the gas household market), no significant entry occurred. The existence of price regulation seems to be a cause of lower market entry and may be exacerbating rather than facilitating competition.
- 92 The entry and exit activity in the Greek electricity market appears very high, but this is mainly due to the fact that the number of suppliers halved in 2012 (from 12 to 6) due to the market suspension of four retail electricity suppliers for incurring overdue debts to the system and market operators, and the withdrawal of two suppliers from the retail market.
- 93 Sweden and Denmark have the most nationwide electricity suppliers (97 and 49 respectively), while Germany and the Czech Republic have the most nationwide gas suppliers (129 and 66 respectively).

74 Absolute values were used to avoid the smoothing (netting) effect that the use of the net entry variable could create. For example, if in one country the increase in the number of suppliers in two years was 50% a year and the decrease in the number of suppliers in the two following years was 50% a year, then the average change over a 4-year period would be 0%, which is an incorrect estimate. Averaging absolute variations reflects the entry/exit dynamics of the market much more closely (in this particular case, the average would be 50%). To highlight which countries saw their number of suppliers decrease in 2013, such countries are coloured in a darker shade of the same colour.

Case Study 1: The Swedish retail market with four bidding zones

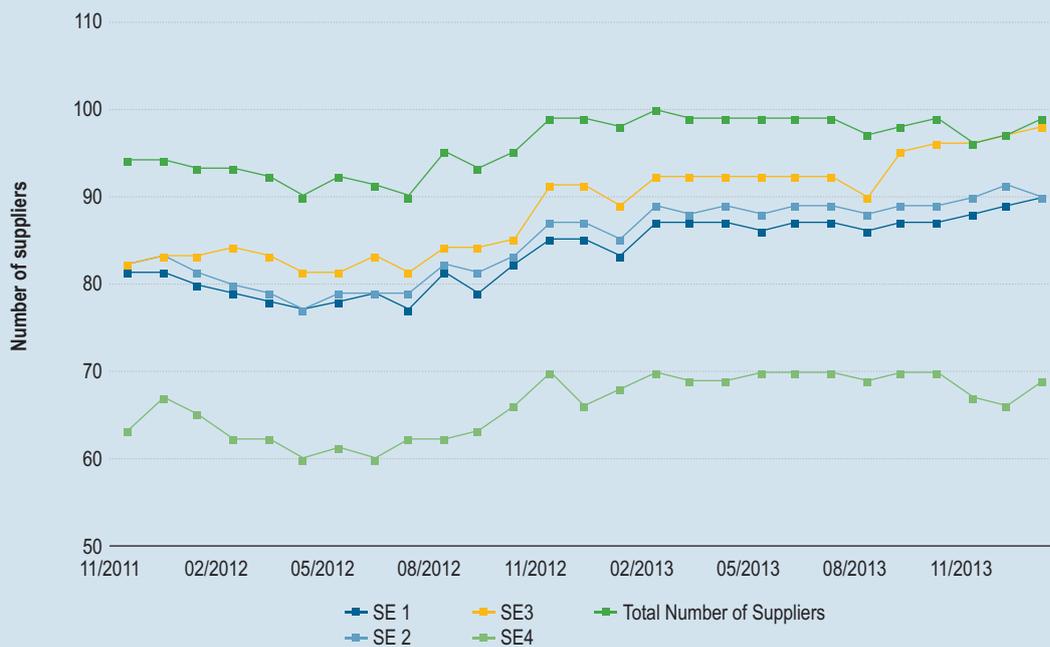
On 1 November 2011, the Swedish electricity market was subdivided into four bidding zones as the result of an assessment by the European Commission, which had raised competition concerns. Before the change, there was a discussion on whether or not this would affect the number of suppliers and thereby competition in the Swedish retail market⁷⁵.

Number of suppliers in the Swedish retail market

Before the introduction of bidding zones in Sweden, there were 120 active suppliers. Figure i shows that this number has not changed since the division of the Swedish wholesale market into four zones, with approximately the same number of suppliers reporting prices and contracts at least once on the price comparison tool 'Elpriskollen.se'.

It is worth mentioning that several of the small suppliers have a relatively small number of customers concentrated in their own distribution network. The Swedish NRA, Ei, estimates that several of these suppliers have a very large market share within their network.

Figure i: Number of suppliers per bidding area – November 2011–2013

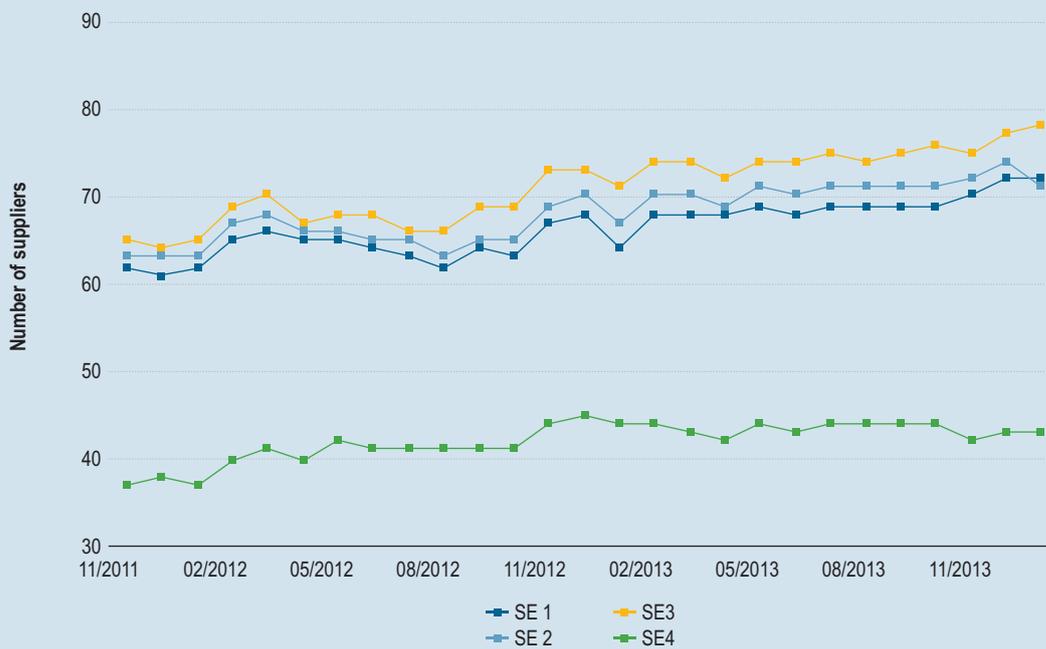


Source: Elpriskollen.se, a consumer website operated by Ei (2014)

Since November 2011, compared to the other three zones, zone SE4 (i.e. South Sweden) had relatively fewer suppliers (around 60). Among them, even fewer (approximately 65% of all suppliers) offer fixed-price annual contracts compared to suppliers in the other three zones (approximately 75-80%) (see Figure ii). Unlike fixed contracts, the number of suppliers offering spot-based contracts is fairly evenly distributed between the four bidding areas.

75 Case No COMP/M.39351 (14.04.2010). See: http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_39351.

Figure ii: Number of suppliers offering fixed 1-year contracts – November 2011– 2013



Source: Elpriskollen.se, a consumer website operated by Ei (2014)

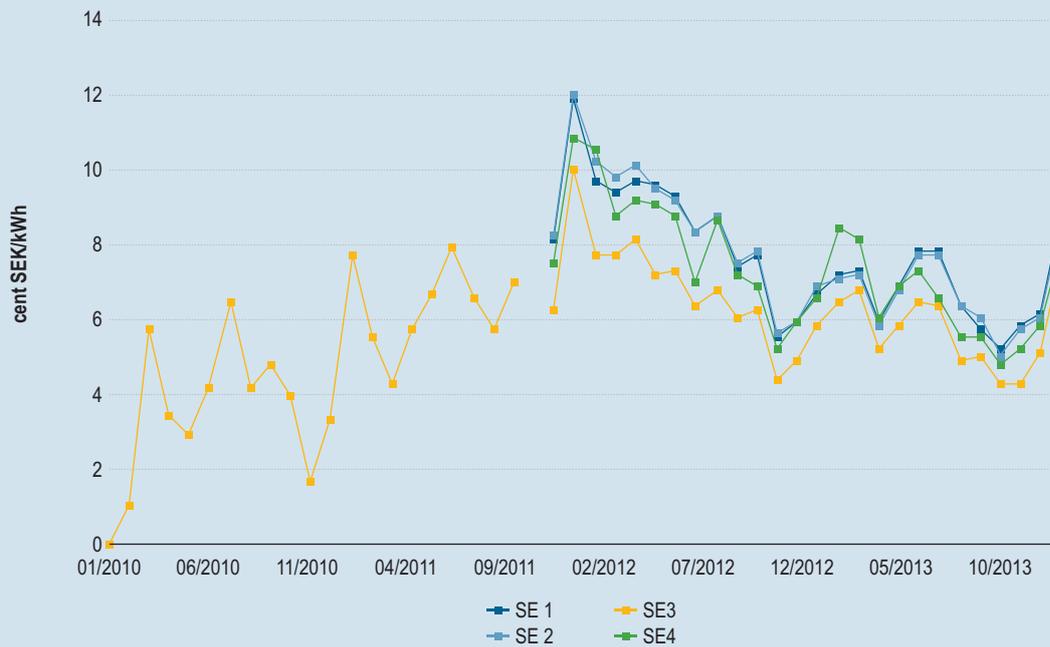
The key reason for fewer suppliers being active in bidding zone SE4 and for them offering fewer fixed contracts is that this zone is associated with greater hedging risk. The zonal prices that are charged to consumers in fixed-price contracts may deviate from the system price in the Nordic Market, and suppliers normally need to hedge these risks in the financial market. The costs of hedging are relatively higher in zone SE4 compared to other bidding areas due to congestion between SE4 and the neighbouring areas.

To further assess competition, for the years since 2010, a year before the market reform, Ei calculated the average margins for the four most common contracts. Electricity supply margins, or mark-ups as they sometimes are called, are defined as the difference between the supplier’s sale prices and purchase prices – the applied methodology is more detailed compared to the methodology applied in section 2.3.2. The remaining margin should cover the costs of administration, marketing and customer service. The profit is also included in the electric supply margin⁷⁶.

The average margins (with an annual consumption of 20,000 kWh) on one-year fixed-price contracts shown in Figure iii increased from 0.05 SEK/kWh to 0.07 SEK/kWh just after the reform was implemented. However, a gradual decrease towards pre-reform levels has occurred since the peak values of 2012.

76 The margins on fixed-price contracts are calculated with prices collected from Elpriskollen.se. From this price, Ei deducted the calculated cost of purchase of electricity futures (system price + relevant EPAD contract), tax, certificates, monthly profile, daily profile, hourly profile, power reserve fee, balance power fee, grid fee, financing costs, trade costs and volume risk. To estimate the margins on spot-based contracts, comparative prices from Elpriskollen.se were deducted with the reconciliation price in the specified bidding area, electricity tax, RECs cost, power reserve fee, balance power fee, basic charge and financing cost.

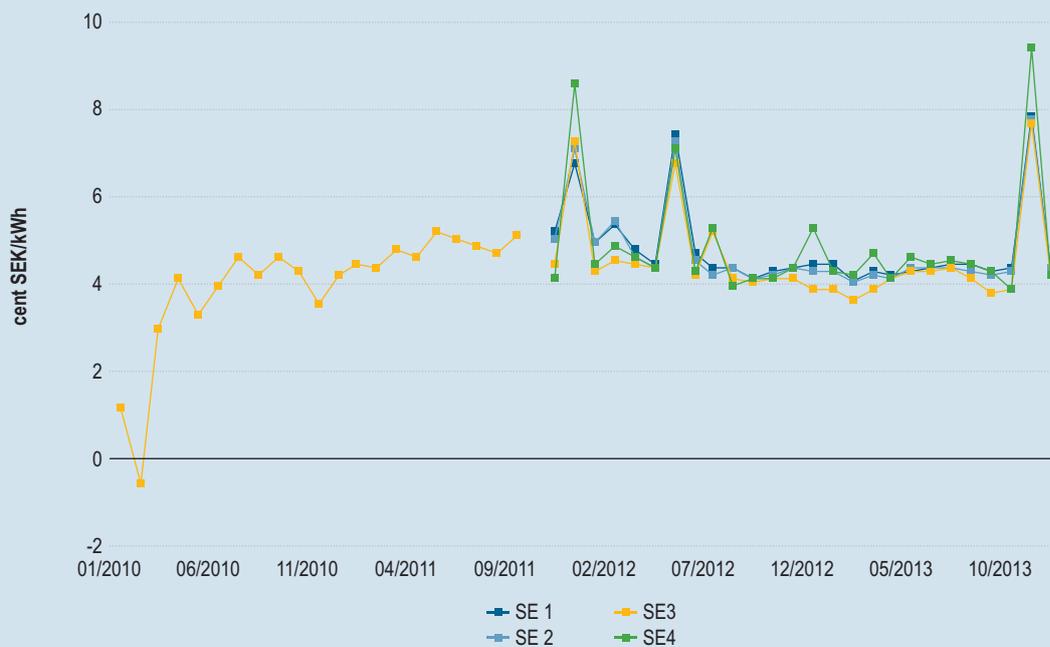
Figure iii: Average margins on fixed 1-year contracts – November 2011–2013



Source: Elpriskollen.se, a consumer website operated by Ei (2014)

The average margins on spot-based contracts shown in figure v increased slightly from 0.04 SEK/kWh to 0.05 SEK/kWh. As with other types of contracts, a tendency towards stabilisation and decreasing margins can be observed from 2012 onwards, although with another peak in late 2013.

Figure iv: Average margins on spot-based contracts – November 2011–2013



Source: Elpriskollen.se, a consumer website operated by Ei (2014)

Minor differences in margins between suppliers in different bidding areas

A caveat regarding the assessment is the limited data available prior to the introduction of the bidding zones, which was decided on May 24 2010. For the one-year contracts signed from October 2010, the market was already informed that the reform would start in November 2011 and that fixed-price contracts would be affected by the new bidding areas.

In conclusion, there is no clear evidence that retail competition in Sweden decreased following the introduction of bidding zones in 2011. Both the number of retailers and the margins are roughly the same as prior to the reform. Furthermore, all retailers that Ei interviewed emphasised that the reform had not hampered retail competition.

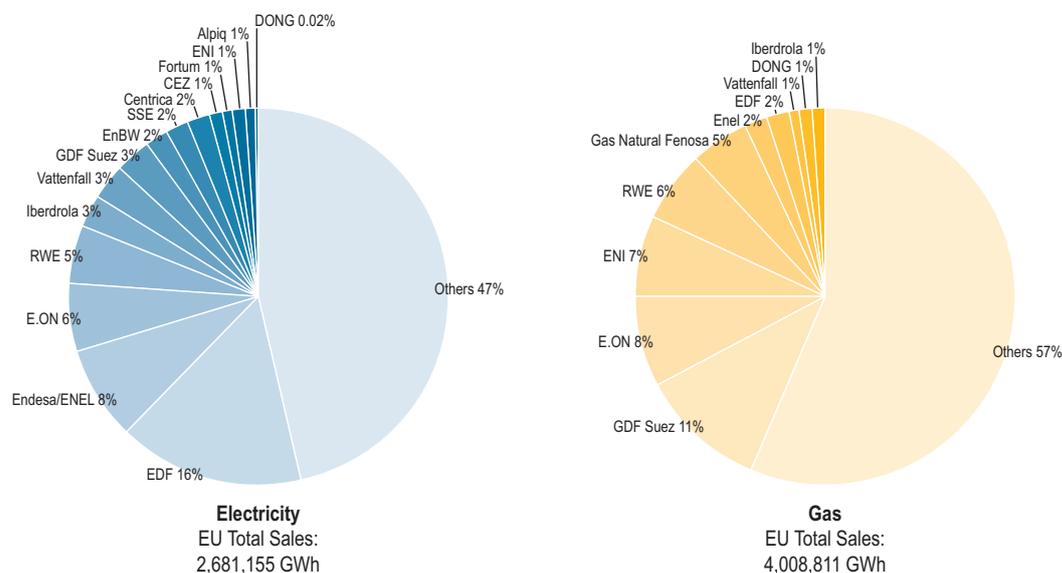
Market consolidation on European level⁷⁷

- 94 Energy market liberalisation initially led to a high level of mergers and acquisitions in the European electricity and gas markets. DG Competition's information on merger cases in electricity and gas markets⁷⁸ shows that these have involved companies in the same market (i.e. electricity/gas companies merging or acquiring other electricity/gas companies), but also companies in different markets (i.e. electricity companies merging with gas companies) and companies that are present at a different level of the supply chain (i.e. electricity/gas producers and suppliers).
- 95 This process has led to the emergence of 'major European suppliers' that are active in both electricity and gas markets (even if this may not always be the case for all countries in which they operate) and which have captured a considerable share of the overall European gas and/or electricity markets.
- 96 Figure 18 below shows the market shares of the largest European electricity/gas suppliers at the end of 2013 calculated by the volume of retail electricity and gas sales. The four largest electricity suppliers (EDF, ENEL/Endesa, E.ON and RWE) accounted for about 35% of all volumes of electricity sold in EU. In gas, the four largest suppliers (GDF Suez, E.ON, ENI and RWE) have a market share of 31%.

77 The scope of this sub-section is not to provide a detailed analysis of the effect of market consolidation on retail electricity and gas markets, but to point out the developments and the 'state of play' in 2013.

78 See: <http://ec.europa.eu/competition/elojade/isef/index.cfm>.

Figure 18 European share of the major electricity and gas suppliers (including national and local players) – 2013 (GWh/year and %)



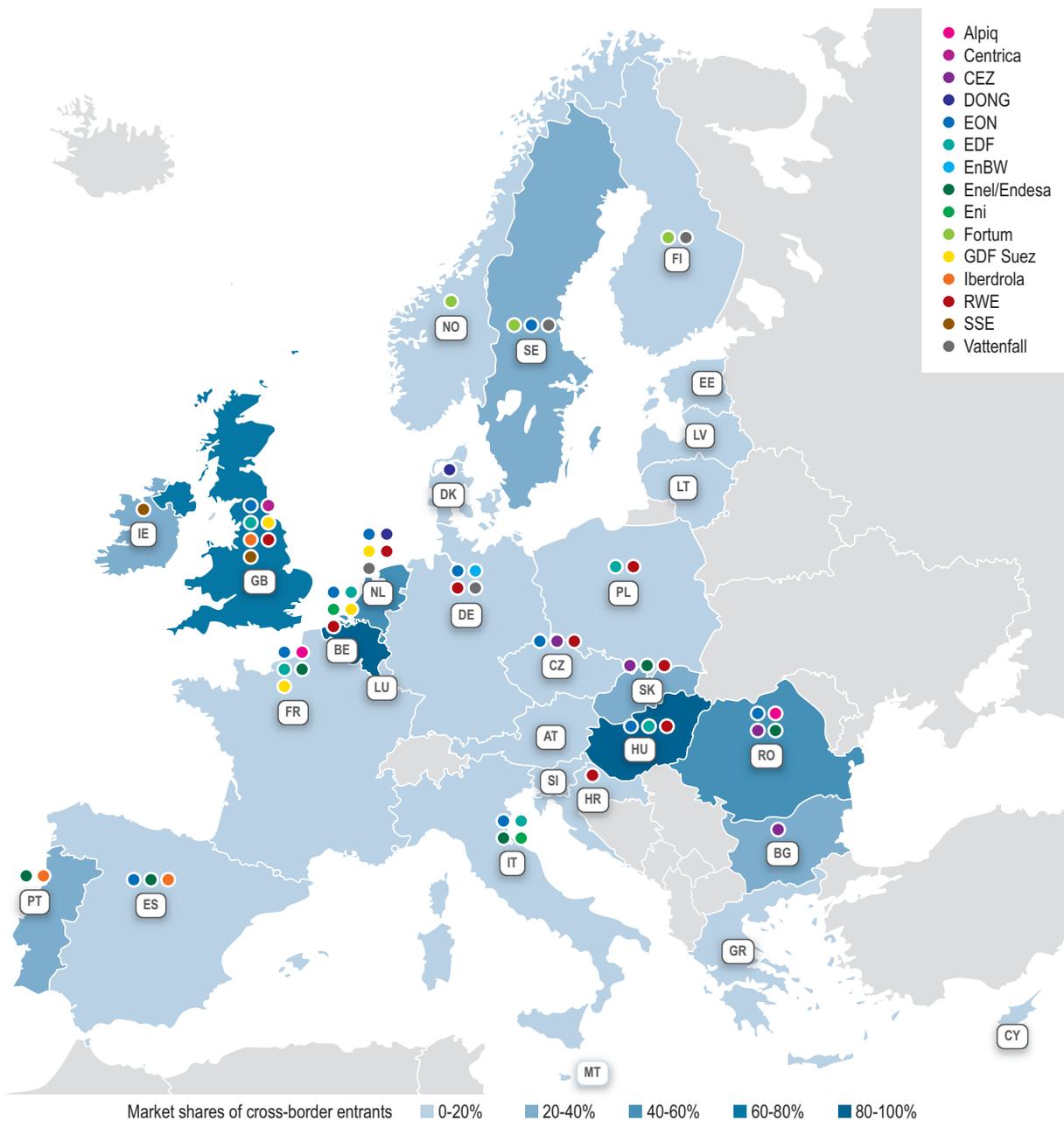
Source: Datamonitor's data (2014) ACER calculations

Notes: EU Total sales represent the total volumes of electricity and gas sold by retailers in the EU 28. These figures are slightly different from Eurostat's demand data, presented in Section 2.2.1, which is based on total consumption including energy purchased by consumers directly on the wholesale markets.

- 97 Figure 19 shows the presence of the major electricity suppliers (see Annex 3 for gas) and the approximate market shares of cross-border entrants in national markets in different countries in Europe in 2013. Suppliers in France, Germany and other Western European countries have participated in the privatisation of the energy sector in Central and Eastern Europe and are now heavily present in these markets. German energy companies were not only active in the privatisation process in the referred region, but also entered markets in other Western European countries (e.g. France, Great Britain, Italy, Spain etc.). The Belgian, Hungarian and British retail markets have been particularly attractive for major market players from other EU countries. Their market shares in the Belgian and Hungarian markets are above 80%, while four of the six largest suppliers in Great Britain are now owned by foreign companies.

- 98 These major players entered markets not only through the acquisition of existing companies, but also used the opportunities of market liberalisation to enter new markets and established their subsidiary firms in several European countries by expanding organically (e.g. EDF and RWE in Poland, E.On in Belgium and RWE in Croatia).

Figure 19: Presence of major European electricity suppliers in Europe and market shares of cross-border entrants in national markets – 2013



Source: Datamonitor's data (2014) and ACER calculations

99 Not surprisingly, countries with higher market concentration levels (i.e. countries on the left-hand side in Figure 16) show lower cross-border entry activity and fewer foreign players. Removing barriers to cross-border entry in these countries may be one way to increase the number of suppliers, which will in turn lead to lower market concentration.

2.3.2 Competition performance

100 This sub-section first explores price competition factors, such as suppliers' margins, wholesale-retail price relationships and price diversification levels, and later assesses other competition elements such as product differentiation.

Mark-up

101 Household electricity and gas suppliers' margins on final POTP prices are a good indicator of the level of retail price competition in a market. High margins tend to indicate low competition levels, as competition would be expected to drive prices down. Over time, high margins would be expected to attract new market entrants. Where this is not the case, barriers to entering the markets are likely to be found.

102 However, any comparison of the mark-up values across different countries should be cautious, as they are likely to differ for a number of reasons, such as:

- different operating costs of running retail electricity and gas companies in different countries (i.e. suppliers' operating costs include activities like marketing, billing customers, metering, staff salaries and bad debt costs);
- differences in volatility in wholesale prices and different hedging strategies employed to 'smooth' retail prices (e.g. forward and spot contracts of varying maturity to manage this market risk);
- long-term bilateral agreements between generation and supply companies, which are often part of the same vertically integrated group;
- various methods of allocating costs and profits across different business units held within the same energy group;
- different national levels of consumption; and
- different sizes of national retail markets.

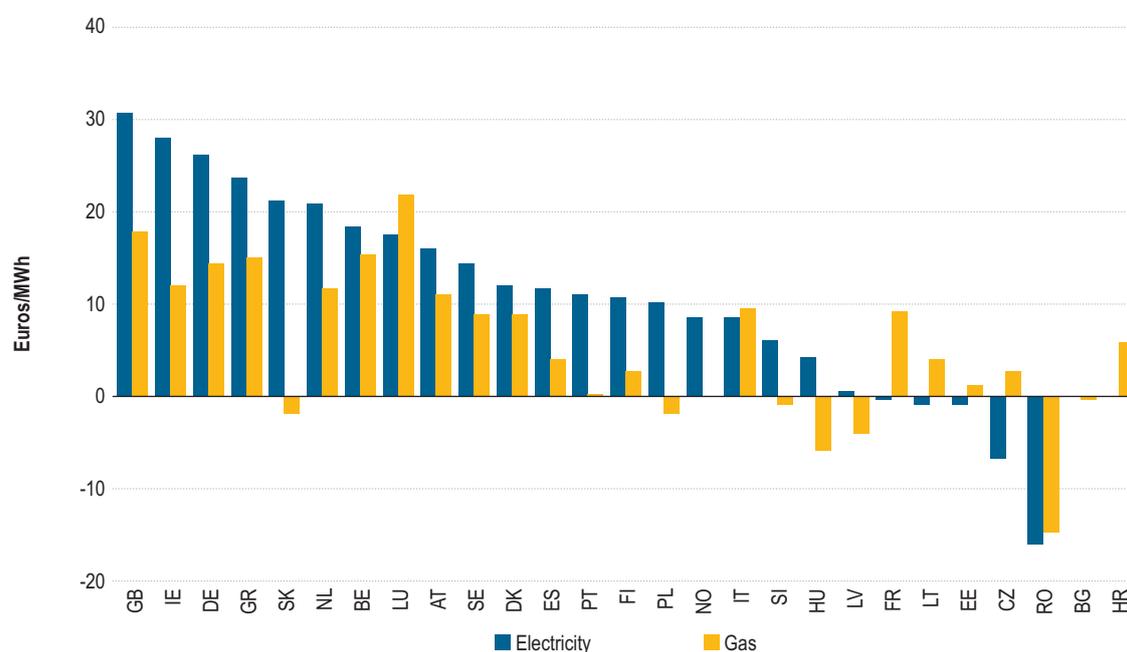
103 The analysis presented in this section uses the difference between the retail energy (commodity) component and the wholesale energy cost (i.e. the mark-up). This is a proxy for the gross margin from which suppliers need to pay, among other costs, operating costs and taxes.

104 When calculating mark-ups in individual countries, different approaches based on data availability have been taken to reflect the retail energy component for electricity and gas markets⁷⁹. Annex 1 details the methodology used for the calculation. The wholesale energy costs incurred by suppliers when buying energy were calculated by taking into consideration the wholesale market price and suppliers' procurement and hedging strategies, which may differ from country to country.

105 Figure 20 shows the estimated average electricity mark-ups over the 2008–2013 period and estimated average gas mark-ups over the period 2012–2013. Values seem to vary widely, even among countries within the same region where the wholesale price is similar or the same, as in the case of the Nordic Region, which has a single power exchange.

79 The electricity energy price component is taken from Eurostat's energy prices break-down data using nationwide data. In gas, due to the lack of Eurostat data, the energy component price has been assessed from ACER's database on retail offers. Only offers in capital cities are taken into account. The energy component used corresponds to the capital incumbent's most common offer.

Figure 20: Average annual electricity (2008–2013) and gas (2012–2013) mark-ups – (euros/MWh)



Source: ACER Database, Eurostat and European power exchanges data (2014) and ACER calculations

- 106 As indicated above, mark-up differences can be partially explained by suppliers' different operating costs and/or expenditures incurred in acquiring and retaining consumers. These may be higher in countries such as Great Britain, Ireland and the Netherlands, where switching rates are relatively high and where suppliers face significant competition and therefore spend additional money on sales, marketing and customer services. Arguably, due to the high proportion of consumers on dual-fuel offers in these countries, costs to serve them could be lower due to service synergies and economies of scale.
- 107 Furthermore, the level of mark-up will depend, *inter alia*, on the consumption level. For example, the electricity mark-up in Sweden measured in euros/consumer would be almost as high as the one in Great Britain, while in the above chart Swedish mark-ups measured in euros/MWh rank relatively lower. The fact that in Sweden the average annual consumption per household consumer is much higher than the European average (i.e. approximately 9,000 kWh versus 4,000 kWh) may explain this situation.
- 108 In some countries with regulated prices, mark-ups have been assessed as negative, as the retail prices energy components seem to be set at levels below wholesale energy costs. This seems to be the case in Latvia and Romania⁸⁰ in electricity, and in Slovakia, Hungary, Latvia, Romania and Bulgaria in the gas market⁸¹. This is potentially creating a dysfunctional market in these countries, not only because negative mark-ups mean that consumers are not facing the true cost of providing energy (and thus are not receiving price signals regarding consumption), but also because this makes these markets highly unattractive for competing energy suppliers, as negative mark-ups constitute

80 Retail electricity and gas mark-ups in Romania are calculated from official sources (i.e. Eurostat data on retail, OPCOM, the Romanian PX, on wholesale prices for electricity and long-term import contracts for gas). In electricity, regulated tariffs for non-households were removed, starting on 1 January 2014, and the energy component in the final price is based on wholesale market prices. If the gas wholesale price (which is regulated by ANRE) were used in the calculation, the gas mark-up in Romania would be positive.

58 81 Gas results correspond to the average mark-up values in 2012–2013. In 2013, Bulgaria shows a positive mark-up.

absolute barriers to entry. Such actions by regulators or governments significantly increase regulatory risks, eventually to the detriment of consumers.

- 109 France also shows a slightly negative mark-up in the electricity market. In France, since July 2011, suppliers can source their electricity by using a special mechanism, ARENH (*'Accès régulé à l'électricité nucléaire historique'* or 'Regulated Access to Incumbent Nuclear Electricity'), which is a right that entitles suppliers to purchase electricity from EDF at a regulated price in volumes determined by the French energy regulator, CRE⁸². Thus, part of their sourcing costs does not depend on the market price, but on the ARENH price if it is below the market price (this part of the sourcing costs may vary between 70 and 90%, depending on consumers' profiles). The ARENH price was 40 euros/MWh between July 2011 and December 2011, and increased to 42 euros/MWh thereafter (the price was the same at the end of 2013). This price is set in such a way as to be representative of the historical cost of a MWh produced by French nuclear power plants and fixed by the government independently of market price considerations. This explains the slightly negative value. If the wholesale sourcing cost of a supplier for a residential consumer is based on 85% ARENH sourcing and 15% of market day-ahead sourcing, this value would be different.
- 110 As previously mentioned, a high mark-up value should trigger price-competition. This is observed in Figure 30 which presents the annual savings that can be made by consumers by switching from the incumbent standard offer to the lowest price offer in the market. According to these data, the largest savings are available in countries which, according to Figure 20, feature higher mark-ups (e.g. Germany, Great Britain, Netherlands, Ireland or Belgium). This indicates that price-competition elements are active in those markets. Theory would predict that these two facts would lead to higher switching rates, but as will be analysed in the next section, it is not straightforward to demonstrate this based on the available data.
- 111 Market entry and exit activity is another factor that seems to be influenced by mark-up levels. MSs with persistently high mark-ups generally have higher entry/exit activity as well, as higher profits attract new market entrants (e.g. Germany, the Netherlands, Great Britain). This would be expected to lead to more competition, lower prices, and the less competitive players being forced to exit. Conversely, markets where the incumbent supplier consistently fails to earn high profits are generally consistent with lower entry/exit activity. These indicators are also affected by the level of maturity of competition, and as previously mentioned, by the presence of regulated tariffs, which in the case of negative mark-ups, would clearly reduce the attractiveness of the market to new entrants.
- 112 In mature markets, when the 'competition phase' has stabilised, a significant entry/exit activity may lead to lower levels of mark-up (e.g. the Czech Republic and Spain in gas household market). However, the situation in the electricity household market is slightly different from gas, as there is not much evidence to show a positive relationship between the level of entry/exit activity and the level of mark-up for electricity suppliers in following years.
- 113 In countries where no significant entry occurred (e.g. Bulgaria, Cyprus, Estonia, Malta in electricity household market and Poland, Luxembourg, Lithuania, Latvia and Greece in gas) regulated prices and the initial low or negative mark-up has led to low entry/exit activity in most cases. The exceptions are Luxembourg in the electricity market and Greece in the gas market. Luxembourg does not

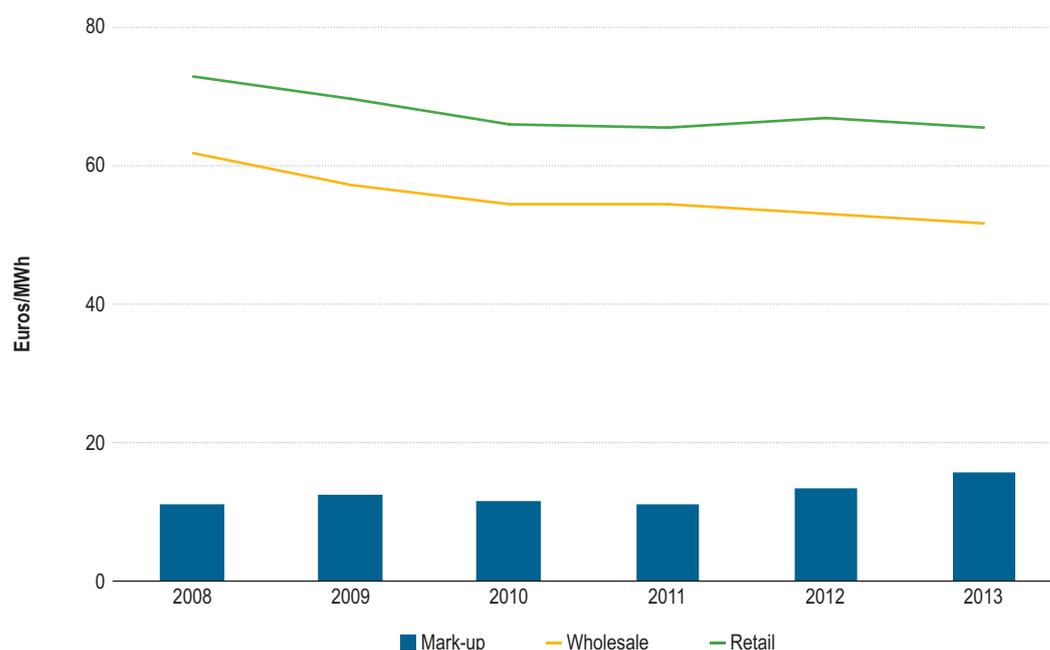
82 In order to exercise their ARENH rights, suppliers are required to sign a standard agreement with EDF to provide a contractual framework for the sales concerned. CRE is tasked with managing this system and calculating the rights, which it notifies to the contracting parties.

regulate retail prices and has high mark-ups, but the entry in the electricity market is still very low and no entry has occurred in the gas market. The small size of the market, in a business featuring economies of scale, is likely to influence entry/exit activity.

The relationship between retail and wholesale electricity⁸³ prices

- 114 The degree of alignment between retail and wholesale prices over time can be a proxy for the efficiency of retail suppliers⁸⁴. Figure 21 shows the responsiveness of the energy component of retail prices to changes in the wholesale price and the evolution of the mark-up over the 2008–2013 period at the European level⁸⁵.
- 115 The data shows that electricity wholesale prices decreased over the 2008–2010 period and remained relatively flat through the rest of the period (i.e. until the end 2013). This wholesale price reduction was followed by a decrease in the energy component of retail electricity prices over the same period. The trend changed in 2010, when retail prices started to increase while wholesale prices remained broadly unchanged. This, in turn, led to an increase in the mark-up over the 2011–2013 period.

Figure 21: Relationship between the energy component of retail electricity price and the wholesale electricity price and mark-up in Europe – 2008–2013 (euros/MWh)



Source: Eurostat, NRAs and European power exchanges data (2014) and ACER calculations

- 116 The degree of connection between the energy component of retail prices and the wholesale electricity prices differs widely among countries, as the data in Annex 2 confirms.

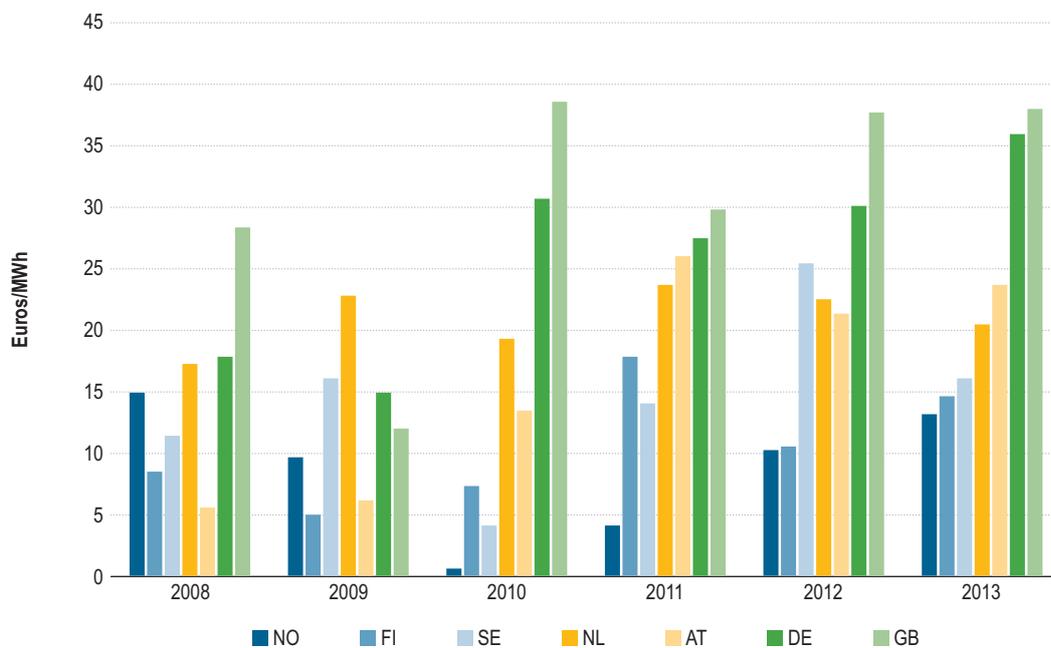
83 Due to the lack of data on gas, this analysis was performed only for electricity (i.e. the data on the energy component for gas over time is not available from Eurostat's energy prices breakdown data, while the Agency's database on retail offers provides this data for two years only).

84 In the electricity market, these overall costs will include a range of variables, including generation, transmission and distribution, as well as operating costs for the supply business (e.g. metering, meter reading, billing, customer service and marketing).

85 See Annex 1 for the methodology applied.

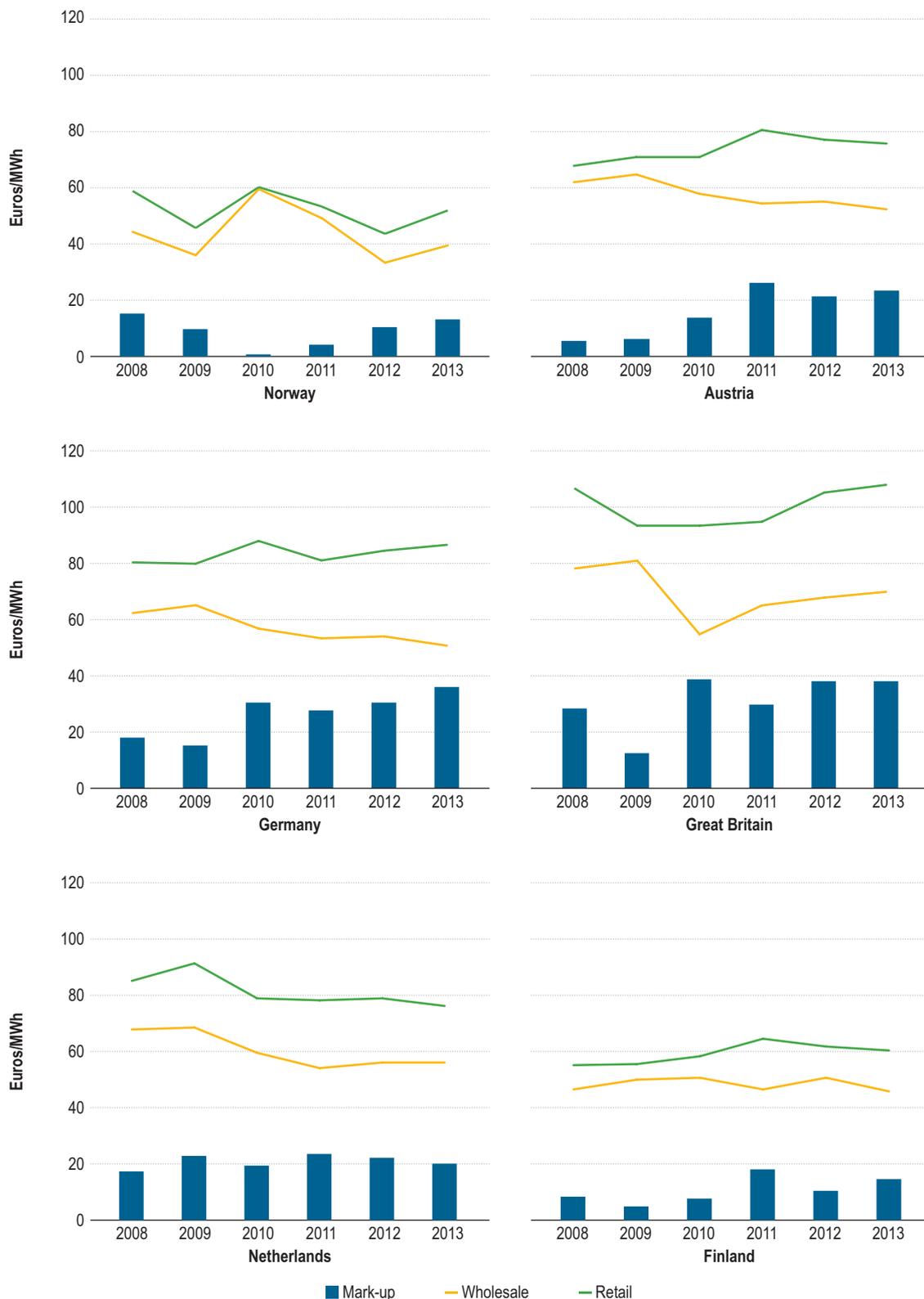
117 Figure 22 below also provides details for a selection of countries which do not apply price regulation, have relatively low market concentration, and perform relatively well based on other indicators presented in this report (i.e. choice of suppliers and offers, switching rates, entry/exit activity, consumer experience etc.). The data shows that even in those countries where the link between retail and wholesale prices was initially expected to be more solid, mark-ups have increased constantly over the observed period. In this respect, changes in retail prices have often not been responsive to changes in the wholesale electricity price. Norway, which has a dynamic retail market and also presents a relatively low mark-up, constitutes the best 'benchmark'. The retail electricity price in Norway is linked to the day-ahead wholesale market, and any changes in the wholesale price (i.e. upwards or downwards changes) are quickly passed on to consumers. Furthermore, it makes the price formation process more transparent.

Figure 22: Electricity mark-up in a selection of countries – 2008–2013 (euros/MWh)



Source: Eurostat, NRAs and European power exchanges data (2014) and ACER calculations

Figure 23: Relationship between the energy component of the retail electricity price and wholesale electricity price and mark-up in a selection of countries – 2008–2013 (euros/MWh)



Source: NRAs and European power exchanges data (2014) and ACER calculations

- 118 In general terms, the energy component of retail and wholesale prices seem to correlate better in two groups of countries, but for different reasons. On one side, prices correlate well in those more competitive countries where the final energy retail electricity price is closely reliant on the wholesale market spot price (e.g. Norway, Sweden and Finland). This good correlation trend is also observed in certain countries featuring retail regulated prices (e.g. Denmark, Lithuania and Poland) where the reason seems to be that the energy component of final consumer retail prices is significantly more reliant on long-term wholesale contracts, whose prices are usually more stable in time.
- 119 Conversely, other countries, such as Austria⁸⁶ and Germany, featured increasing mark-ups during the observed period. These countries presented relatively stable energy components in retail prices that did not reflect the observed decrease in wholesale prices⁸⁷. Great Britain also showed a weak relationship between retail and wholesale prices and an increasing mark-up; meanwhile, the Netherlands showed a better correlation between the two price components, but also a relatively high mark-up, albeit slightly decreasing from 2011.
- 120 In some of these countries, mark-ups seem to be higher than the values that could in principle be expected, posing questions about the extent of real price competition in these markets. Given the particularities of each country, the analysis of the relationship between wholesale and retail prices for electricity and gas markets merits further in-depth studies by NRAs. Variables that may impact the relationship with wholesale prices are the particular characteristics of the retail price contracts (i.e. duration, fixed or variable prices and price indexation mechanisms).

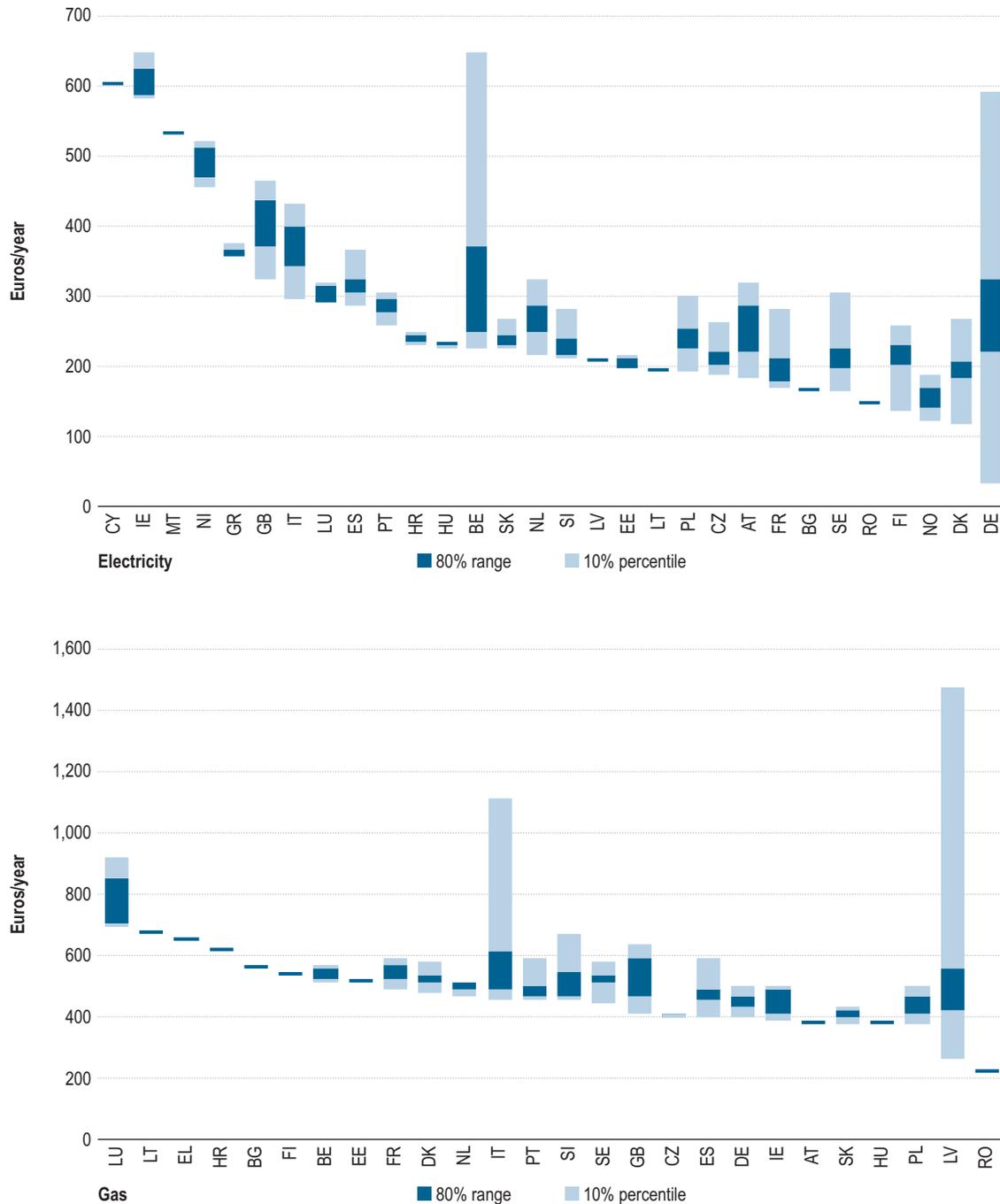
The price dispersion of the energy component of retail offers

- 121 As was the case last year, the Agency examined the price dispersion of the energy component of all retail offers in European capital cities in 2013. The comparison of this individual price component provides a valid representation of the actual level of price competition among the different suppliers, as the other retail price components – i.e. network charges and taxes – are generally equivalent/proportional for all similar retail offers.
- 122 Figure 24 shows in blue the range of the energy component price dispersion of 80% of offers in the capital city, and in grey the prices of the offers distributed to the remaining 10% and 90%.

86 Incoherencies between the development of electricity end-user prices and that of wholesale prices between 2008 and 2012 caused E-Control to instigate a market inquiry pursuant to section 21(2) Energie-Control-Gesetz (E-Control Act) in conjunction with section 34 E-Control Act and section 10 Elektrizitätswirtschafts- und -organisationengesetz (Electricity Act) 2010.

87 See the EC DG COMP Energy prices and costs report indicating this trend http://ec.europa.eu/energy/doc/2030/20140122_swd_prices.pdf.

Figure 24: Dispersion in the energy component of retail prices for households in capitals – December 2013 (euros/year, ranked)



Source: ACER Database (November–December 2013) and ACER calculations

123 The comparison of the dispersion of the energy components in the retail offers in Europe shows bigger differences in electricity than in gas. The individual demand/supply features of national electricity markets, mainly driven by their diverse generation portfolios and costs, sustain more significant wholesale price differences among countries, which are translated into more varying energy component price ranges.

- 124 In electricity, in the capital cities of those countries where liberalisation is more mature, and which therefore maintain more offers available and with more varying characteristics (e.g. Belgium, Germany, Great Britain, or Sweden), price diversification is greater, albeit with a very different value for the energy component (e.g. much higher in capital cities of Belgium and Great Britain than in Sweden). In countries applying regulated prices and countries with a share of the market where regulated and liberalised prices co-exist, price dispersion is lower and clustered around the regulated price. While price dispersion may indicate the extent of competitive activity in the market, countries' individual data must be carefully interpreted and not viewed in isolation from other indicators. Large price divergences may also reflect inefficiencies in price formation mechanisms, e.g. lack of information or difficulties comparing prices by consumers and consumer inertia.
- 125 In gas, a comparison of energy component prices primarily shows that their levels are relatively similar, as matching price ranges can be found in several EU MSs, with the more notable exceptions of certain regulated MSs whose prices rank below the EU average, arguably triggered by the fact that they feature negative mark-ups. These findings are aligned with the conclusions of the wholesale price chapter (see Section 4.2.1), showing the increasing gas wholesale price convergence that was registered among EU MSs.
- 126 An individual MSs analysis indicates that in the majority of countries, the energy component of retail offers in gas is not widely dispersed. In the large majority of EU MSs, the energy component of 80% of capital city available offers seems not to vary by more than 50 euros/year. The more notable exceptions would be Austria, Germany, Great Britain and Italy, where price diversification seems to be stronger, but also with a different value for the energy component. This fact is possibly supported by the greater number of offers available in those MSs' capital cities, and on the more extended offer of additional services or varying characteristics that may affect final prices.
- 127 On the contrary, in those MSs applying only regulated gas prices – or in those others offering them and also with a certain share of the market under liberalised market prices (e.g. France, Spain and Belgium) – the price dispersion of the energy component is reduced. In those MSs, the energy component of the regulated tariff seems to set a focal point on which the large majority of offers converge, and price-competition seems more reduced.

Product differentiation

- 128 Levels of competition in retail markets are not exclusively related to price elements. As the maturity of the market increases, the scope of pure price competition is arguably reduced. In those more mature markets, suppliers develop product diversification strategies and utilise other competition elements to attract and retain consumers or increase their margins. This sub-section discusses the main topics regarding suppliers' product differentiation and non-price competition elements in retail energy markets. These findings are closely connected with the data presented in Section 2.3.3.
- 129 In a market of undifferentiated products, consumers will be unwilling to pay more for the products of different firms compared to the cheapest offer. However, if differentiated products are offered, firms may be able to charge a higher price. In a fully liberalised energy retail market, the more successful a supplier is in differentiating its products, the more insulated its demand will be from the actions of other suppliers. In this way, an innovative supplier which differentiates its product can carve out its own market and exert market power and thus increase profits.

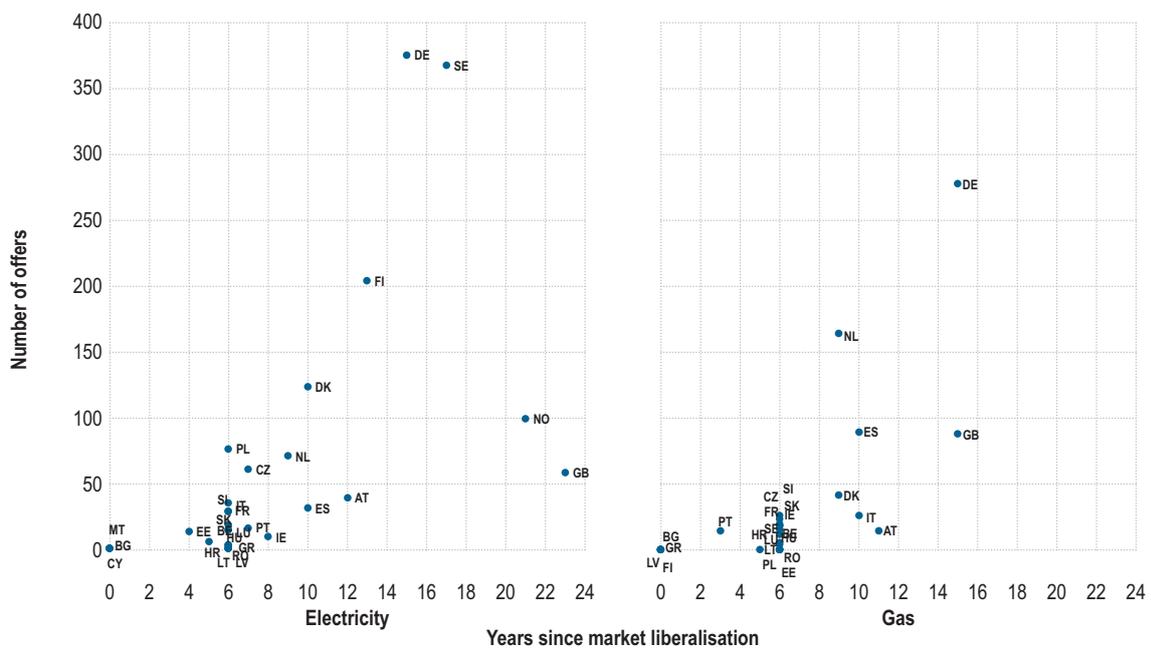
- 130 The scope for substantive product differentiation in the energy retail market is debatable. However, over the last few years, retail energy markets have witnessed increased evidence of product innovation offered by both well-established suppliers and by smaller niche players. As discussed, the innovation in retail products may include characteristics such as contract duration, price preservation periods, dual-fuel offers, additional service provision or renewable/green features. These innovative products offer more choice to consumers in an industry that was once considered to be completely homogeneous.
- 131 Overall product diversification strategies are increasing not only for new entrants, but also for incumbent suppliers, who are adjusting their schemes in order to enhance consumer loyalty, market shares and margins.
- 132 As the findings in Section 2.2.3 indicated, fixed-price offers prevail in the majority of European countries. These offers give consumers the advantage of protecting themselves from price increases, which allows for easier budgeting. The availability of forward wholesale products allows suppliers to hedge their supply costs and support the offering of fixed retail-prices⁸⁸. Other consumers prefer variable price offers, as these usually present a slightly lower initial price than fixed ones.
- 133 Many suppliers also recognise the importance for some consumers of ‘green issues’, and design their products accordingly. Some suppliers even distinguish between different categories of green consumer, and offer them products with different levels of greenness. These products are usually more expensive, as in some cases suppliers need to compensate for the higher supply costs of only sourcing renewable energy. But in certain cases, where green supply costs are competitive, they can result in higher net margins. Entirely green products may be requested by consumers who are happy to pay a premium for such products, while other less green products may appeal to consumers who are environmentally aware, but not ready to pay a (higher) price for energy.
- 134 Another product diversification strategy is linked to the presence of dual-fuel products (i.e. bundled products combining the supply of electricity and gas with an overall discount). Dual-fuel products usually represent additional savings for consumers, as well as lower costs for suppliers as a result of lower marketing and billing costs. Dual-fuel products also enhance the ability of electricity companies to enter gas markets and vice versa, possibly at the expense of new entrants, who will face increased operational complexity and may feel forced to enter both the electricity and gas markets simultaneously in order to be able to propose attractive commercial offers.
- 135 In addition, suppliers are also offering free or price-competitive merchandise and/or services associated with the contracting of electricity or gas products. As suppliers are conceivably capable of negotiating better prices than individual consumers, as a result of economies of scale, the offer of these products/services may attract price-responsive consumers who would pay higher prices if independently contracting the associated products. In other cases, and following good marketing strategies, these plans can attract certain consumers willing to obtain products or services that perhaps they did not initially consider they needed. In order to make an informed choice, it is very important that customers receive clear and accurate information on the cost of all associated product or services when buying an energy package. The contracting of these plans may result in higher overall margins for suppliers once the cost of the provided product/service is discounted⁸⁹.

88 Where liquid wholesale markets are not available, suppliers are more dependent on their individual long-term supply contract prices, which arguably translate into more stable retail prices.

89 See: BEUC (2013), Consumer rights in electricity and gas markets – BEUC position paper, December 2013: https://www.beuc.eu/publications/x2013_083_mst_consumer_rights_in_electricity_and_gas_markets.pdf.

- 136 Despite the general proliferation of product diversification, it is also evident that suppliers in the capital cities of some countries are innovating very little, if at all (e.g. electricity and gas suppliers in the capitals of Bulgaria, Greece, Latvia and Romania; electricity suppliers in capital cities of Cyprus and Malta; and gas suppliers in capital cities of Croatia, Finland and Poland). This is arguably linked to the dominance of the incumbent electricity or gas supplier which, in the absence of competitive pressure, has no incentive to innovate.
- 137 Figure 25 provides further evidence that market liberalisation encourages innovation. For electricity, it shows that in countries where market liberalisation occurred earlier, the number of offers is greater, although the capitals of Norway and Great Britain seem outliers. A similar, though less convincing pattern was observed for gas, with Italy and Austria being outliers.

Figure 25: Number of offers in capital cities in 2013 and years since market liberalisation



Source: ACER retail database and ERGEG (2014) and ACER calculations

- 138 In some countries (e.g. Great Britain and Ireland⁹⁰), electricity and gas suppliers are also expanding their business areas and moving towards becoming ‘energy service providers’. Most suppliers offer home insulation, boiler insurance and smart metering products and services. Another emerging market is that of micro-generation. Most suppliers offer products and services in this area, including installations of technologies such as Photovoltaics (PV), wind, solar thermal, biomass and heat pumps.
- 139 Boiler installation and other types of home improvement, such as insulation and boiler maintenance, are also offered by many suppliers. Some suppliers also offer plumbing, drainage and electrical insurance, and in some cases, in Great Britain, a ‘landlord service’, which includes inspections and the completion of Gas Safety Records. A limited number of suppliers also offer phone and/or broadband services. In this respect, innovation may result in the bundling of offered products and/or services.

90 Information on the additional non-free product and services provided by suppliers is not available from the ACER’s Database; the only way to obtain this information is to search suppliers’ websites in all MSs. The Agency did not have the time/resources to do this for all countries and therefore provided this information only for Great Britain. The initial research shows that situation in the Republic of Ireland is similar.

140 Research⁹¹ from the telecom sector suggests that consumers who have a package are less likely to switch supplier than consumers who buy stand-alone products, as consumers may be able to benefit from savings when choosing the same supplier for several services. Furthermore, as bundling strategies seem to reduce the comparability of services offered, consumers seem to be less keen to consider switching supplier, because they think it will be too difficult to compare services offered by different suppliers. Similarly, consumers who have packages appear to be less likely to consider switching, because they think it will be relatively time consuming.

2.3.3 Consumer behaviour

141 This subsection aims to assess how price and non-price competition performance – appraised with the indicators presented above – affect consumer behaviour. To do so, the section assesses: (i) electricity and gas market switching rates; (ii) whether consumers are active in the market; (iii) the reasons consumers choose to switch or not; (iv) whether consumers are satisfied with electricity and gas services; and (v) whether consumers are able to compare suppliers' prices easily. These factors affect the scope and mechanisms that suppliers can use when competing in a given market.

Switching activity

142 The ability to choose between alternative suppliers and the ability to negotiate products' conditions are key features of any competitive market. Household consumers are generally offered standard contractual terms and conditions by suppliers. Therefore, they are unable to negotiate on an individual basis as industrial consumers may be able to do.

143 In previous MMRs, the Agency expressed concerns about the low switching rates registered in many countries. The rate at which consumers switch⁹² indicates customer participation in the market, making it an important variable to understand in assessing market functioning.

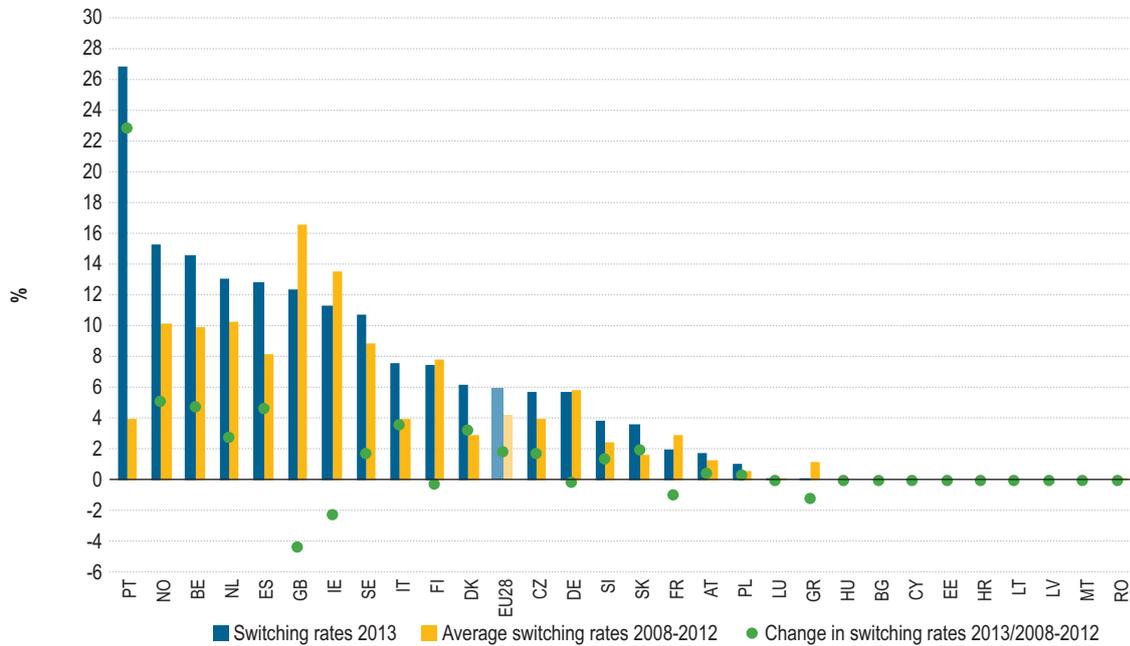
144 In 2013, Great Britain, Ireland, Norway and the Netherlands continued to have higher switching rates than the majority of other countries in the electricity market, all situated above 10% (Figure 26). In 2013 Portugal and Spain recorded a high increase in their switching rates compared to the average values over the 2008–2013 period (an increase of 22.9% and 4%, respectively) and joined the group of countries with switching rates above 10%⁹³. Although electricity switching rates remain low in many countries, the overall trend is upward.

91 See: Ofcom (2010), The Communications Report 2010: UK, August 2010: <http://www.ofcom.org.uk/static/cmr-10/UKCM-1.52.html>.

92 Unless stated otherwise, throughout this report a consumer switch refers to the action whereby a consumer acts and changes his/her supplier and where the meter point associated with a household consumer is re-registered with a different supplier.

93 Switching rates for Spain and Portugal also include switching values within the same group, but different company suppliers (i.e. switching from the regulated tariff offered by an independent company to liberalised market tariff offered by a different company within the same group).

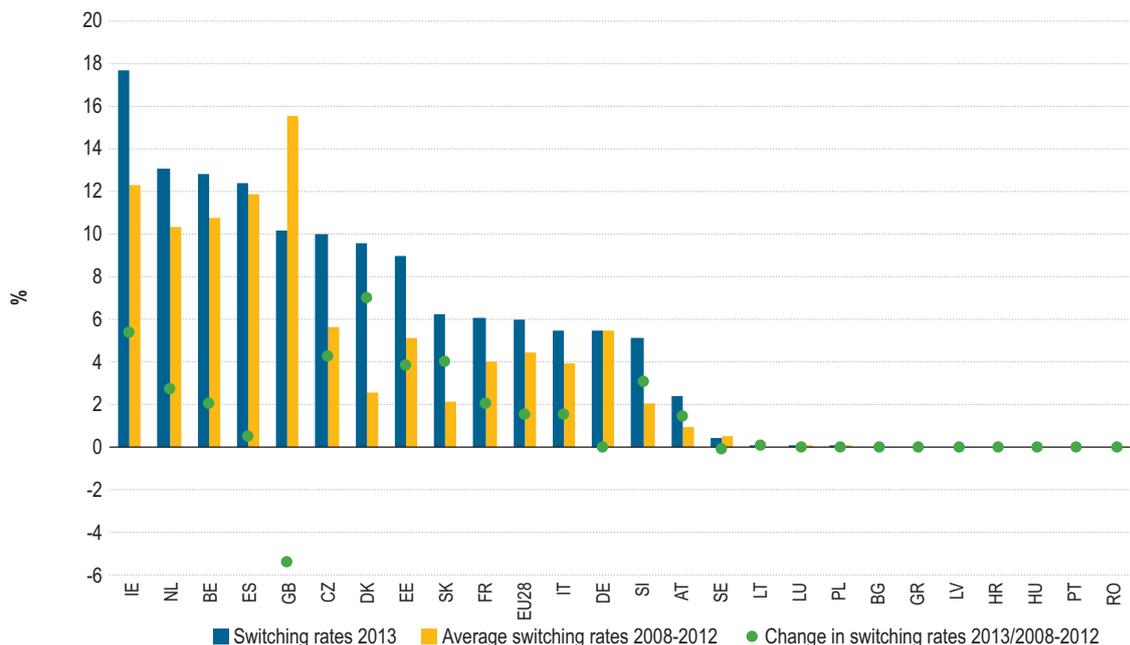
Figure 26: Switching rates for electricity household consumers in Europe – 2008–2012 and 2013 (% and ranked according to switching rates in 2013)



Source: CEER National Indicators Database (2014) and ACER calculations

145 The overall picture regarding gas switching rates (see Figure 27) is similar to that for electricity: switching rates are increasing, but few countries have switching rates above 10%. Nevertheless, the average switching rates across Europe are slightly higher for gas than electricity. The highest increase in gas switching rates in 2013 was recorded (again) in Spain, Slovakia and Slovenia.

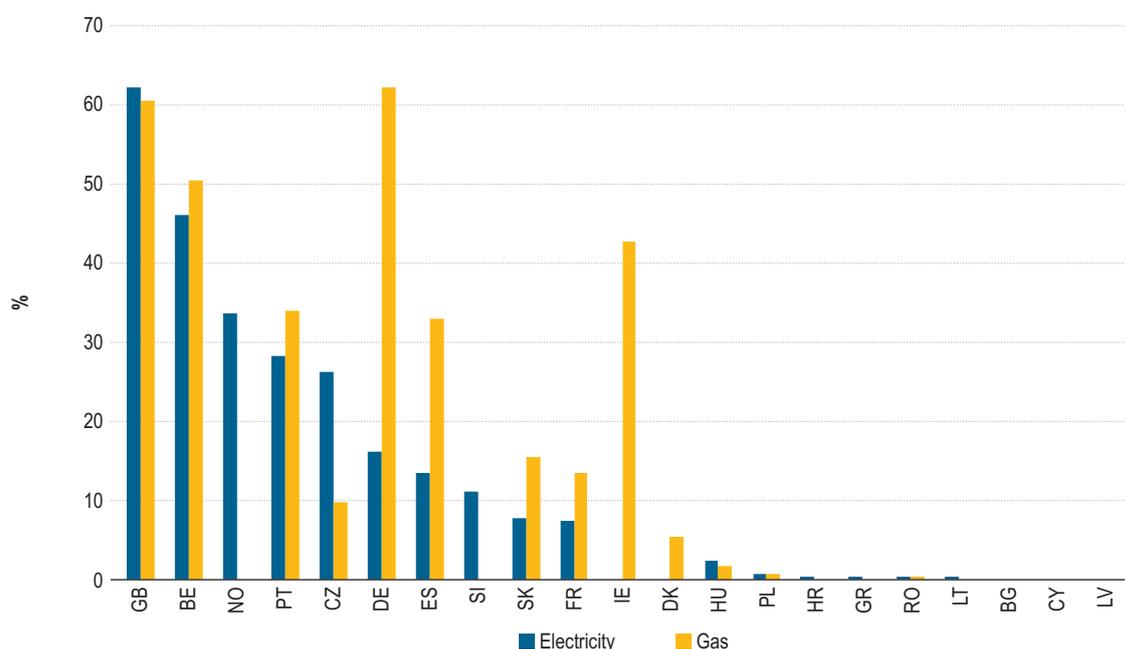
Figure 27: Switching rates for gas household consumers in Europe – 2008–2012 and 2013 (% and ranked according to switching rates in 2013)



Source: CEER National Indicators Database (2014) and ACER calculations

146 Although the overall European switching trend is upward in both gas and electricity markets, Figure 28 shows that the proportion of consumers who have a contract with an alternative supplier to the incumbent is still very low in the majority of countries (the exceptions being Great Britain, Belgium and Portugal in both markets, Norway and the Czech Republic in electricity and Germany, Spain and Ireland in gas markets). This indicator is relevant, as the proportion of consumers with an alternative supplier to the incumbent is indicative of the fraction of consumers who have switched at least once⁹⁴.

Figure 28: Proportion of electricity and gas consumers with a different supplier than their incumbent supplier – December 2013 (%)



Source: CEER National Indicators Database (2014) and ACER calculations

Notes: For Belgium, the electricity figure is based on data for Flanders only (representing around 58% of the overall electricity market – based on the number of access points), while the gas figure is based on data for Flanders and Wallonia (representing 86% of the overall gas market – based on the number of access points).

Switching behaviour

147 While the switching rates data presented above may indicate the extent of competitive activity in the market, countries' individual data must be carefully interpreted and not viewed in isolation from other indicators. This sub-section aims to explore the reasons and the interactions triggering switching behaviour in different countries.

Market liberalisation

148 Switching rates are usually higher during the early stages of market opening, largely triggered by more significant price-competition (e.g. the Slovenian gas market in 2012⁹⁵). They are also high in competitive markets, where consumers are both price and non-price responsive (e.g. Great Britain

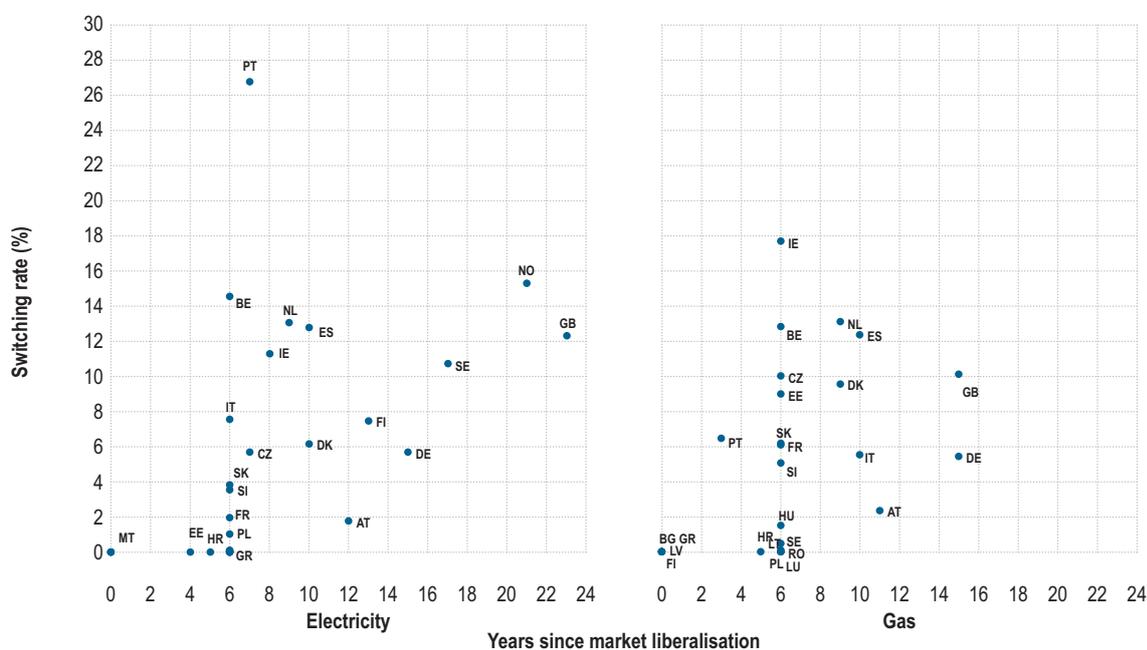
94 Conversely, figures on the proportion of consumers still with their incumbent supplier are indicative of the proportion of consumers who have never switched, although they may also include those consumers who may have switched away from the incumbent and subsequently switched back to it (i.e. switched more than once).

95 See: MMR 2012 case study 7 on gas switching rates in Slovenia: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Market%20Monitoring%20Report%202013.pdf.

and Ireland). However, once the price-competition phase of the market is more stabilised, and/or consumers are satisfied with their current suppliers, switching rates may be lower, even in competitive markets (e.g. Austria and Germany⁹⁶).

- 149 Figure 29 illustrates a weak but positive relationship between switching rates and time since market liberalisation, showing that switching tends to be higher in those countries where the market has been liberalised longer. However, in some countries which introduced full retail competition later, consumer activity has gathered momentum, and they recorded a very high switching rate relative to the number of years since market liberalisation (e.g. Belgium and Portugal in electricity and Belgium and Ireland in gas).

Figure 29: Relationship between switching rates and years since market liberalisation – (%)



Source: CEER National Indicators Database (2014) and ACER calculations

- 150 A factor that may impact the above relationship is that, although liberalisation may have taken place in a given market, there is usually a delay between liberalisation and the observed switching effect. This is because certain elements required for switching need time to develop (e.g. consumer awareness of competition and choice and the switching process). Nevertheless, there are other reasons which explain why consumers may choose to switch or not, as referred to below.

Price responsiveness

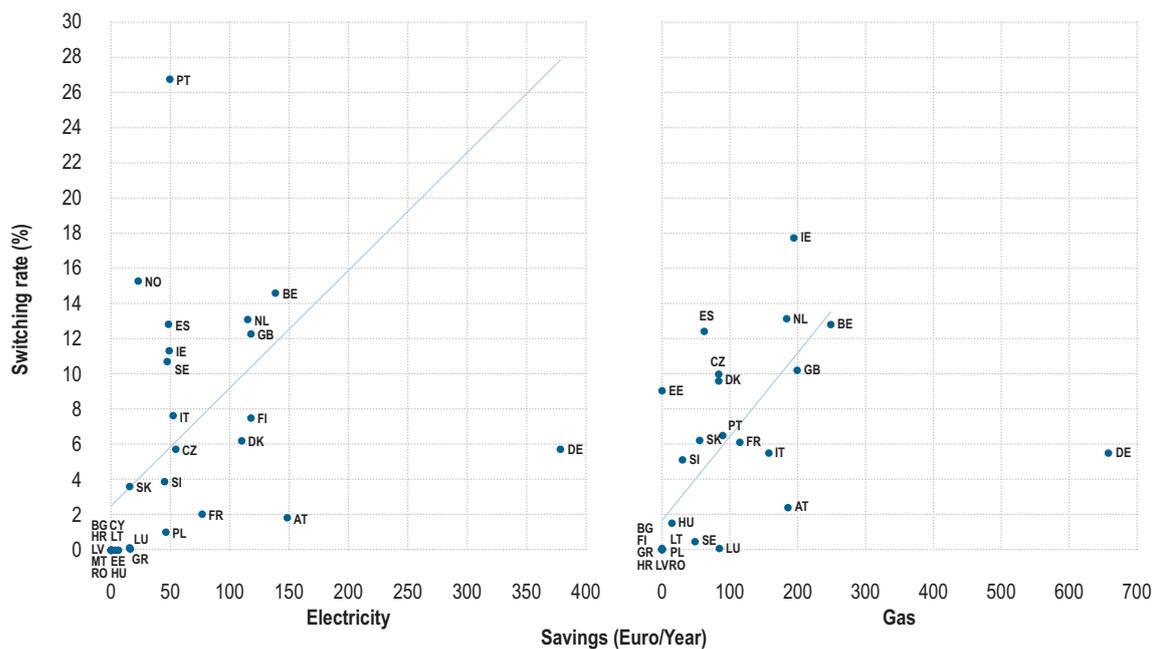
- 151 It is generally assumed that if consumers are price responsive, in a situation where price differences exist, they will tend to switch to the supplier offering a cheaper supply contract. To assess this, pricing data obtained from price comparison websites and switching data have been compared.
- 152 Figure 30 shows that notable savings might be achieved by switching from the incumbent standard offer to the best offer in the market. The analysis shows that the alternative offers were cheaper than the incumbent supplier offers in a majority of MSs. For household electricity consumers, the average

96 In these two markets, the strong presence of segmented and trusted regional suppliers reduces switching rates.

annual saving available (compared to the incumbent standard offer) ranges from over 16 euros in Greece to 378 euros in Germany. In gas, annual saving opportunities are much higher and range from 38 euros in Romania to 355 euros in Germany.

- 153 Figure 30 also shows that, in some capitals, switching rates seem to be positively related to price differentials, more so in gas than in electricity as consumer switching is influenced by other factors. This is consistent with the findings of last year’s report.
- 154 Differences may be explained, among other reasons, by the phase of competition in the market. It is important to observe that data may be affected by the regional segmentation of competitors in the market (in the figure, switching data are national, whereas price data correspond to the capital). Savings assessed in the exercise were calculated based on the retail price of the most usual incumbent offer in the capital city. The particular features of the incumbent’s standard offer in comparison to other competitors’ prices (and particularly the features of the lowest price offer) may affect the correlation values presented below.

Figure 30: Relationship between countries’ overall switching rates and annual savings available in capital cities – 2013 (%)



Other factors

- 156 It is evident that, apart from potential savings (i.e. price responsiveness), other determinants can influence consumers' switching decisions. For the preparation of this MMR, the Agency benefited from the support from BEUC, the European consumer organisation, in assessing these determinants⁹⁷.
- 157 The reasons for consumers not switching to the lowest price suppliers include:
- lack of awareness of the significant savings that can be made – in some countries, this may even be exacerbated by the high number of retail competitors, which increases search costs;
 - complex tariff structures, thus making it difficult to identify potential savings;
 - loyalty to their incumbent supplier – this is most likely to be relevant in countries with municipal suppliers;
 - perceived complexity of the switching process (i.e. consumers are 'afraid' of switching suppliers because they fear being cut off during the switching process) – as they are not aware of the obligations of local distributors to guarantee uninterrupted supply; and
 - lack of understanding of the unbundling of retail and distribution grid operations – consumers believe that they have to remain with local incumbent suppliers to have access to technical assistance and service in the case of a disruption.
- 158 While none of these issues alone may be responsible for low switching rates, in combination they deter consumers from switching. Therefore, targeting single issues rather than a range of deterrents may not be effective. Rather, a combination of transparent and reliable price comparison tools, better information on unbundling and simple efficient processes for switching supplier will contribute to improving switching rates.
- 159 In some countries, authorities and politicians have not been very active in promoting switching opportunities (or even consumer awareness of competition and the option to switch). However, other countries (e.g. Great Britain, Austria, Belgium, and Italy) show that public information campaigns and/or tariff calculation tools offered by or encouraged and supervised by regulatory authorities can be useful.
- 160 In other countries, switching has been triggered by fiercer competition in the media among suppliers (e.g. in the Czech Republic suppliers' led strategies via increased marketing activities, which led to higher switching rates).

97 Further exchanges of knowledge with BEUC on this topic are envisaged in the future.

Case study 2: Satisfaction with the existing supplier as a positive deterrent to switching in the Netherlands

The Netherlands Authority for Consumers and Markets (ACM) considers active consumers to be the prime beneficiaries of a well-functioning market. They put pressure on suppliers to lower their prices, to improve the quality of services and to innovate their products. Moreover, consumers that are not active in the energy market are those most likely to pay higher prices (see also: Case study 3 on tariff surveillance). Thus, identifying switching barriers and removing them has a dual effect, helping to improve the functioning of the market.

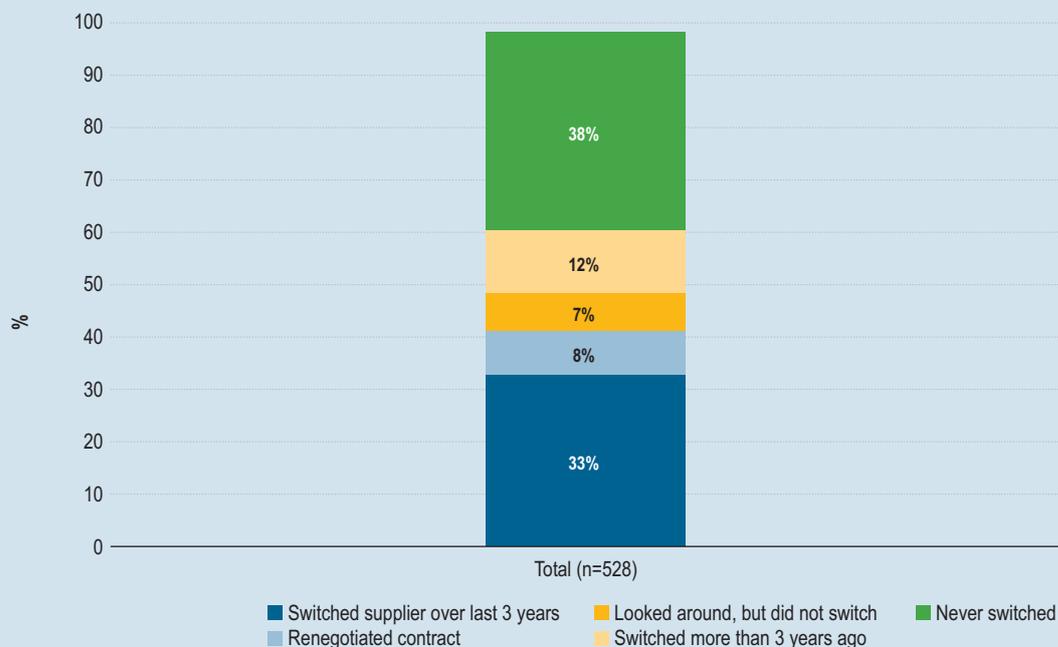
Dutch household consumers⁹⁸ who do not switch claim to be very satisfied with their current supplier. ACM conducted a study to find out if this is true, and with a view to tackling switching barriers for consumers in the energy market.

The Dutch energy market for household consumers

Since the full liberalisation of the energy market in 2004, 45% of household consumers have switched supplier⁹⁹, most of them in the past three years. In addition, 8% of consumers renegotiated their contract with their current supplier and 7% sought a better offer, although they did not switch (Figure i).

The annual household switching rate has seen a steady increase since market liberalisation, and rose to 13.1% in 2013, which is the highest switching activity since market opening in 2004.

Figure i: Consumer switching behaviour in the Netherlands



Source: ACM, July 2014

98 Only household consumers are considered in this study.

99 Data is based on an online consumer survey undertaken for ACM in the first half of 2014.

Consumers who switched supplier saved an average of up to 300 euros per year¹⁰⁰. The switching procedure, although perceived as troublesome in the early years after the market opening, is now perceived as straightforward: 95% of consumers who switched supplier are satisfied or very satisfied with the process. Despite the financial benefits, 45% of all consumers, excluding those who renegotiated their contract, have not switched supplier, and 38% have not been active at all in the energy market.

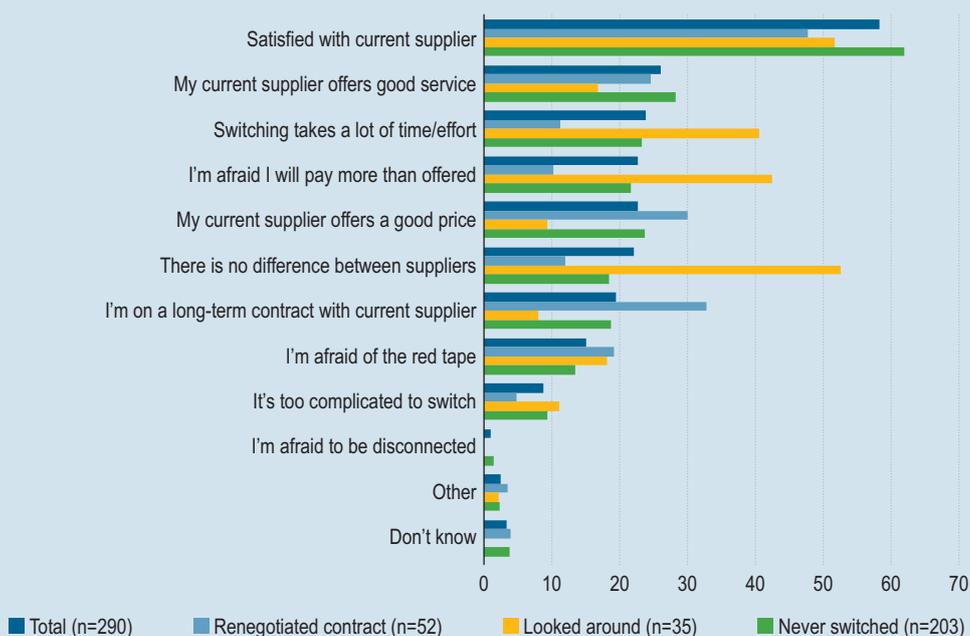
Reasons for switching

The majority of consumers switch to save money. A group of consumers who switched supplier more than three years ago and have not switched since, chose to do so consciously for green electricity. Interestingly, consumers who renegotiated the contract with their own supplier found their current supplier very trustworthy.

Satisfaction with current suppliers

Dutch consumers say they are very satisfied with their current supplier. When asked about the level of service provided by their current supplier, 80% of all household consumers say that they are satisfied or very satisfied, while 19% are indifferent. Only 1% of consumers are unsatisfied. Satisfaction with their current supplier is also the main reason 62% of consumers who have never switched supplier did not do so (figure ii). Further reasons for staying with their current supplier include good-quality service and the price of their current supplier. The group of consumers who sought better deals but did not ultimately switch mention other reasons for not switching: no perceived difference between suppliers (53%); fear of ending up paying more than promised (43%); and a time-consuming and bothersome switching procedure (41%).

Figure ii: Reasons for remaining with the current supplier



Source: ACM, July 2014

100 Based on a snapshot analysis of offers for dual-fuel on price comparison websites in March 2014.

The question is whether this apparent satisfaction is, in fact, contentment with the current supplier, or whether consumers are content with the situation as it is now. A small group of consumers may be satisfied with their current supplier, but the majority generally do not have much to do with their supplier. One could argue that the satisfaction (or a part thereof) expressed by these consumers is in fact more a reluctance to change things as they are now, or a matter of their familiarity with something they have known (or think they have known) for a long time. This is where the effect of cognitive biases may play a role.

The perceived price gap trigger

Misconceptions about the savings that can be achieved when switching supplier also play a large role. On average, household consumers claim they would switch if they could save at least 175 euros annually; however, on average, they think that they can only save up to 82 euros annually. This perceived price gap is a significant switching barrier and could be reduced by informing consumers of the actual savings which could be made (as high as 300 euros). Nevertheless, consumers do not base their decisions solely on rational choices.

Cognitive biases

When consumers feel insecure about what they can do, about what choices are available, they will rely on heuristics, or simple shortcuts, which enables them to deal with complex issues, or things that they perceive as complex, such as the energy market. This can lead to cognitive biases. It is not easy to detect cognitive biases and measure their influence on consumers' inertia. Based on previous studies and scientific literature, ACM is currently focusing on addressing three cognitive biases in its external communication and awareness campaigns for consumers in an attempt to prompt consumers to choose consciously: social proof, the status quo bias and the loss-aversion bias.

Social proof

Social proof is an important bias. One could argue that, while most consumers do not switch, the social standard is not to switch. Indeed, when asked, only 10% of consumers say that they would probably switch supplier within the next two years. However, when switching is recommended by family members or friends, 31% of all consumers say that they would probably switch.

Status quo and loss-aversion bias

Another bias that causes inertia is the status quo bias. Consumers tend to stick with what they know and are less likely to trust new energy suppliers. Only 21% of all consumers trust new and unknown energy suppliers. The status-quo bias is probably also the most important reason for consumers to renegotiate their contract with their own supplier. Closely related to the status quo bias is the loss-aversion bias. Consumers are, on average, risk-averse and try to minimise losses. Figure ii shows that 23% of all consumers do not switch because they are afraid they will ultimately pay more than the alternative price being offered.

Figure iii: Reasons mentioned by consumers for not switching suppliers



Source: ACM, July 2014

Cognitive biases may change over time. If the current trend in switching continues, the social preference bias will most likely shift towards a situation in which the social norm is to switch. Assuming that consumers start to share their positive experiences, the status quo bias will subsequently also change. And, consequently, the loss aversion bias will indeed also lose its grip on inertia. However, ACM decided not to wait for this slow and uncertain process to happen.

Switching campaign 'You snooze, you lose'

ACM made it a priority in 2014 to address switching barriers for consumers, recognising that consumer-oriented interventions affecting their switching decisions are not the only option. Energy suppliers themselves can and will have to improve their offers, contracts and bills with regards to clarity, comparability and simplicity. ACM has already taken a number of measures to achieve this goal.

By using its national point of contact Consuwijzer.nl as the main communication channel, ACM provided consumers with the information and tools to start comparing offers from energy suppliers. In November 2013, Consuwijzer launched its switching campaign and used some of the insights into cognitive biases. The campaign employed so-called 'nudges'¹⁰¹ to influence consumer switching behaviour. The campaign video (<http://youtu.be/VmP8sYUqN1s>) entitled 'If you snooze, you lose' prompts consumers to participate actively by pointing out that, by doing nothing, they will certainly lose money. ACM recognises that the effect of 'nudging' is difficult to measure or verify, so the campaign is considered part of an ongoing experiment and a learning process towards effectively influencing consumer behaviour.

101 Nudges are subtle messages or incentives to influence consumer behaviour, without interfering with the consumer's free choice. See also: Nudge: Improving Decisions about Health, Wealth, and Happiness, Richard H. Thaler, Cass R. Sunstein.

Consumers' experiences

- 161 This sub-section considers the four key areas of consumers' experience of the retail electricity and gas household markets and their relation to consumer engagement, i.e. switching:
- satisfaction with electricity and gas services;
 - views on the choice of products available to them;
 - ability to compare suppliers' prices easily; and
 - experience and perception of the switching process.
- 162 Information about consumers' experiences is a key aspect for assessing the overall performance of the electricity and gas markets for households.
- 163 Consumers' perception of choice can be understood as a prerequisite for consumer engagement while consumers' perception about the ease of switching influences their engagement. Consumers' views are important indicators of whether suppliers are responding adequately to changing consumer preferences. If consumers are not satisfied with their current supplier, they are more likely to switch and thereby drive competition in the market.
- 164 As pointed out earlier in this section, consumers' switching behaviour depends to a great extent on whether they are able to make informed choices (i.e. compare various offers easily) and their experience and perception of the switching process. Without appropriate information, consumers are unable to make an informed choice and this, in turn, may lead to less optimal market outcomes (i.e. suppliers will be better able to exercise some degree of market power). Data on consumers' experiences, therefore, provide further evidence of how competition works when combined with data on other indicators (e.g. prices, mark-up, product differentiation, market concentration, switching, etc.).
- 165 In order to assess consumers' experiences, the Agency obtained data from a customer survey undertaken for the European Commission's Directorate-General Health and Consumers¹⁰² and analysed it to understand how competition works at the level of the individual household consumer, in particular with the expectation that markets exhibiting a high level of offer activity and good competition (as presented in previous chapters) a) serve consumers who acknowledge a good choice on the market; and b) serve engaged consumers (exhibiting higher switching rates). On the other hand, markets that are not functioning well may adversely affect consumer satisfaction and their perception of choice, i.e. exhibiting, on average, lower consumer satisfaction scores.
- 166 Table 2 below summarises the findings in the four key areas of consumers' experiences with respect to the electricity and gas household markets.

102 The EC DG Health and Consumers regularly compiles a Consumer Market Scoreboard, which provides at the EU-wide level a quantitative assessment of how different markets work for consumers. The 2013 edition of the Market Monitoring Survey, which has been used as the main statistical source for the 10th edition of the Consumer Markets Scoreboard (published in June 2014) can be found at the following address: http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/market_monitoring/index_en.htm. It should be noted that it was not possible to conduct interviews for both electricity and gas markets in every country as: (i) gas markets do not exist in some countries; and (ii) in some countries, these markets are monopoly markets and therefore the questions of the switching component and the choice component were not asked for these specific markets.

Table 2: Consumer perception of selected elements of the retail electricity and gas household markets and switching rates – 2013 (ratings)

	Expectations		Choice		Comparability		Ease of switching		Switching rates (%)	
	E	G	E	G	E	G	E	G	E	G
AT	8.3	7.8	7	6	6	5.9	6.4	6	1.8	2.4
BE	7.7	7.6	7.8	7.4	6.8	6.7	7.4	7.1	14.6	12.8
BG	4.5	7	1.6	5.2	4.6	6.9	2.1	5.9	0	0
HR	6.5	6.6	2.2	3.5	4.9	5.9	3.2	4.1	0	0
CY	6	-	-	-	6	-	-	-	0	-
CZ	7.2	7.1	7.1	7	6.5	6.4	7.4	7.1	5.7	10
DK	8.2	8.1	6.8	6	5.1	5.2	6.8	6.6	6.2	9.6
EE	6.7	7.8	6.8	3.4	5.4	6.9	5.8	4.7	0	9
FI	8.3	-	8.1	-	6.3	-	7.2	-	7.5	-
FR	7.4	7.3	7.5	7.3	7.2	6.9	7.2	6.9	2	6.1
DE	7.9	7.4	8.1	7.4	7.6	7.1	7.6	7.1	5.7	5.5
UK	6.8	7	7.4	7.5	6	6.2	6.5	6.8	12.3	10.2
GR	5.8	7.4	-	5.7	5.7	7	-	6.2	0.1	0
HU	6.7	6	5.5	5.4	6.3	5.7	4.3	4.6	0	1.5
IE	7.5	7.2	6.3	5.7	6.3	6.4	7.4	7.1	11.3	17.7
IT	6.8	6.9	6	5.9	5.6	6.4	6.4	6.3	7.6	5.5
LV	7.4	7.5	2.1	3.4	4	5.7	2.5	3.4	0	0
LT	7.5	8.2	4.6	-	8.1	8.7	3.8	-	0	0.1
LU	8	7.5	7.5	7.4	7.2	7.6	7.4	7.5	0.1	0
MT	6.9	-	-	-	6.7	-	-	-	0	-
NL	8	7.6	8.3	7.6	6.6	6.6	7.2	6.8	13.1	13.1
NO	7.1	-	8.3	-	6.2	-	8.1	-	15.3	-
PL	6.9	7.2	4.8	5	6	6.8	5.3	5.6	1	0
PT	6.8	7.5	5.6	5.4	6	6.6	6.1	6.2	26.8	6.5
RO	6.6	6.9	4.6	3.5	7	6.9	4.5	4.1	0	-
SK	7.8	7.9	7	6.5	7.1	7.9	6.8	6.8	3.6	6.2
SI	8.4	8.4	7.5	7.4	7.4	7.9	7.6	7.6	3.9	5.1
ES	5.8	6.9	4.7	4.9	5	5.9	5.8	6.3	12.8	12.4
SE	8	-	8.6	-	5.7	-	7	-	10.7	0.5
Average	7.2	7.4	6.2	5.9	6.2	6.7	6.1	6.1	5.6	5.6

Source: DG SANCO (2014) and ACER calculations

Notes:

'Expectations' is a dimension that measures the extent to which the market generally lives up to what consumers want, assessed with the question: "On a scale from 0 to 10, to what extent did the products/services on offer from different retailers/providers live up to what you wanted within the past year?"

'Choice' measures if consumers are satisfied with the choice of different suppliers/retailers in a given market and is assessed with the question: "On a scale from 0 to 10, would you say there are enough different retailers/providers from which you can choose?"

'Comparability' reflects the ability of consumers to compare between products or services as they are offered by different suppliers or providers in the market, and implicitly includes a price and quality comparison. This topic was assessed with one question: "On a scale from 0 to 10, how difficult or easy was it to compare the products/services sold by different retailers/offered by different service providers?"

'Switching' is evaluated through actual switching behaviour and the perceived ease of switching (both for consumers who have actually switched and for consumers who have not). This component was assessed with the question: "On a scale from 0 to 10, how difficult or easy do you think it would have been/was it to switch provider in the past year?"

- 167 The above results show that markets in Belgium, the Czech Republic, the Netherlands, Norway and Sweden are markets with engaged electricity household consumers (relatively high switching rates) who perceive their markets to be functioning well¹⁰³. The same is true for Belgian, Dutch, French, German, Slovakian and Slovenian gas household consumers, showing higher switching rates and good consumer perception of the market.
- 168 Consumers in Finland, Luxembourg, Slovakia and Slovenia also show a positive experience and view of the electricity and gas markets according to the four categories analysed in their respective countries (i.e. they are the highest scoring countries over all elements). This, however, may not always affect their actions (for example, lower switching rates for electricity household consumers in Luxembourg, Slovakia and Slovenia, despite the high overall consumer perception scores).
- 169 British, Portuguese and Spanish electricity and gas consumers could be perceived as the most critical consumers in Europe, having switched the most despite their relatively low ratings of the perceived choice and/or comparability of offers on the market.
- 170 Bulgaria, Croatia, Hungary and Romania are clearly at the bottom of the ranking. The large difference between the scores for different elements is a clear indication that the performance in these markets is highly country-dependent, and thus that it is possible, through actions on a national basis, to improve.
- 171 Consumers in Bulgaria, Croatia, Latvia and Romania are particularly dissatisfied with the choice of suppliers¹⁰⁴. These findings are in line with the analysis presented in Section 2.2.3, which also shows that consumers in these countries have no choice at all or very little.
- 172 The results of the consumer survey also suggest that consumers in many MSs do not find the price comparisons and switching process easy. It is important that pricing information be transparent, relevant and accurate for the consumers who use it, particularly where it underpins the decision to switch supplier.

103 Average scores higher than 7.

104 Consumers in countries where consumers have no choice of supplier (i.e. where only one supplier exists) are not asked this question.

2.4 Barriers to efficient retail market functioning

173 This section analyses the barriers that still hinder retail market integration and some of the possible improvements that could facilitate their better functioning. In this regard, the section analyses, first, the different barriers that suppliers may face when entering new EU MS retail markets (Section 2.4.1), then provides an update of the situation of regulated retail prices across EU (Section 2.4.2) and finally provides insights into the potential of demand response solutions (Section 2.4.3).

2.4.1 Barriers to cross-border entry into retail energy markets

174 The 2nd edition¹⁰⁵ of the MMR analysed the level of foreign presence in national retail markets and pointed out the lack of cross-border entry into EU MSs retail energy markets in general. Since cross-border entry into retail energy markets has the potential to improve competitiveness, it is important to identify and assess barriers and obstacles to cross-border entry and expansion.

175 In view of this, the Agency commissioned a study to perform a range of in-depth interviews based on a questionnaire of 43 questions with 30 carefully selected EU suppliers that have entered adjacent cross-border retail markets. In the interviews, they expressed their experience with cross-border market entry barriers in electricity and gas¹⁰⁶. It is worth mentioning that the reported findings are based on the perceptions identified from the mentioned suppliers' opinions and that further research is needed to validate the legitimacy of the individual barriers mentioned in each MS. However, all of the reported barriers were mentioned by more than one interviewee.

Customer behaviour

176 One problem perceived by suppliers is the difficult access to market information for customers, especially for profiled¹⁰⁷ customers. This is based on the fact that reliable price comparison tools do not exist in some of the MSs¹⁰⁸ (e.g. Croatia, France and Romania). Other interviewees expressed concern about missing communication between NRAs and customers (e.g. announcements of market liberalisation and its consequences for market participants). Hence, according to these suppliers, in some countries, customers are not aware that they can change their energy provider, e.g. in Croatia and Poland.

177 In other cases, interviewees claim that there are unjustified fears, e.g. in terms of security of supply, which are even reinforced by NRAs due to the lack of transparent unbundling/branding rules (for example, the same name of former state-owned producer/distributor and retailer in Croatia – HEP Group; or similar names in France – EDF and ERDF). Even if customers intend to change the suppliers, there may be additional barriers, such as difficult and non-transparent switching procedures, e.g. in France, Italy, Slovakia and Slovenia, long termination periods (e.g. in Germany, Poland and Hungary) or cease charges for customers (Poland).

105 See: MMR 2012, pages 29 and 142.

106 E-Bridge (2014), Barriers to cross-border entry into retail energy markets, October: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/References/Barriers_to_cross_border_entry_Final_Report.pdf.

107 Profiled customers: customers with standard load profiles (i.e. households and small business units).
Non-profile customers: intensive energy customers with an individual demand forecast (industrial plants and generation).

108 In some MSs, price comparison tools exist, but according to the suppliers interviewed, these instruments are not sufficiently reliable to give customers adequate information.

Regulatory framework

- 178 A key concern often expressed by interviewees is the lack of access to relevant information for new entrants. In some countries, there is a perception that relevant data are lacking, e.g. customer databases in Bulgaria and France or price information/statistics in Croatia, the Czech Republic, Hungary, Poland and Slovakia. In this context, it was additionally pointed out that in most MSs important information and documents are available only in the respective local language, and not in English. This problem seems to be particularly relevant for Eastern and Southern European markets.
- 179 Retail price regulation is another key barrier, which, according to most of the interviewees, results in very low or negative retail margins. This means that regulated prices are too low and often even below wholesale price levels. This is especially perceived in Croatia, Hungary, Poland, Latvia, Lithuania, Italy and France. Regulatory periods are sometimes too long and, in some countries the price calculation for regulated retail is perceived as non-transparent and more influenced by political decisions than by market-based and economically rational considerations (especially in Eastern Europe).
- 180 In addition to the application of price regulation, interviewees mentioned a second reason for (too) low margins, which is intense competition (e.g. in Austria, Belgium, Germany and the Netherlands). This cannot be perceived as a barrier to entry in a classic economic point of view, but it may hinder further market entries nevertheless.
- 181 Another issue observed is the difficult and time-consuming licensing procedure for entrants based on the requirements of NRAs. Along with the significant bureaucracy and the quantity of documents that have to be provided, detailed reporting obligations and various licenses are requested (e.g. Bulgaria, Croatia, the Czech Republic, Spain, Hungary, Italy, Poland, Romania and Slovakia). For example, in some countries, it is mandatory to provide an official translation of legal documents (Poland), or a resident lawyer is required (the Czech Republic and Spain; in Croatia, a local taxable subsidiary is even required). Additional issues for smaller entrants are requirements concerning high bank guarantees in order to obtain a license (e.g. in Hungary).
- 182 In addition, in some countries there is a perceived high degree of uncertainty about future regulatory developments. The interviewees mentioned the non-transparent decision-making process, which is often influenced by politicians (especially in Eastern Europe). But, also for Western Europe, regulatory changes are often alleged as short-term and characterised by ex-post de facto amendments (France, Italy or the Netherlands), resulting in high and unpredictable financial consequences for suppliers.
- 183 High environmental obligations are not regarded as a high entry barrier. However, some of the interviewees lament the lack of harmonisation of environmental rules/obligations across the EU, as they perceive these obligations in several countries to be yet another tax imposed on them (Germany was cited in particular). It was also mentioned that the impossibility of cross-border trading in environmental certificates (for electricity) is a potential barrier to entry. In summary, the stability of the regulatory framework and fear of political influence are the main factors hindering further cross-border market entries.

Wholesale markets

- 184 In general, wholesale regulation is perceived as a significant barrier to entry. This includes, for example, obligations/quotas regarding the country of origin of traded natural gas in Poland, or political influence (by the incumbent e.g. EDF on wholesale price regulation in France (ARENH)).

- 185 As some important documents are not available in English, language issues are also a crucial point for grid access. Some interviewees also mentioned complex and difficult access to the grid due to high reporting obligations, especially in Eastern Europe. Other problems are complex network codes and high IT requirements.
- 186 to cross-border capacities and associated regulation also play a relevant role for potential entries. Such barriers were explicitly mentioned for France, Hungary and Eastern Europe in general.
- 187 Another important issue is the liquidity of energy markets. In particular, it was frequently stated that dominant incumbents and lack of diversification in power production are responsible for illiquid markets (Bulgaria, Croatia, Hungary, Romania and Slovenia). Furthermore, disrupted exchanges are barriers to entry and expansion (especially in Eastern Europe). In Croatia, for example, no OTC market exists, while the OTC market in Romania is dominated by a state-owned incumbent. In Slovenia, future trading products do not exist and, Croatia has no power exchange at all.
- 188 Moreover, barriers to entry due to balancing regimes were stated by interviewees. In particular, balancing is still underdeveloped (poor quality and complex access to requested data in Romania and Poland) and, often, very expensive for retailers (Austria, Bulgaria, Croatia and France), especially in gas markets. Due to portfolio effects, these barriers are even higher for smaller suppliers (and hence for potential new entrants). Additionally, high storage obligations (for gas) are mentioned as an issue for many interviewees, and were especially mentioned for Bulgaria, France and Poland.
- 189 The existence of a transparent and functioning wholesale market – especially exchanges and access to cross-border capacities – significantly influences the decision to enter a new market.

Additional challenges

- 190 In the last section of the questionnaire, the interviewees had the opportunity to state other relevant problems which may prevent (cross-border) entries into the retail energy markets of the EU. In essence, most of the issues mentioned above were confirmed by the answers. In addition, the lack of standardisation of contracts (e.g. between supplier and DSOs), processes and reporting obligations concerning market entries in the various MSs appear to be significant barriers to market entry.
- 191 This is especially relevant for relatively small market players, as their playing field is even more restricted. They generally do not have the required national expert knowledge and external expertise is costly for them.
- 192 Moreover, it has become apparent that uncertainty about future regulatory developments is often greater for foreign than for local entrants. Foreign retailers have fewer contacts with NRAs than local retailers, which increases their information disadvantage. They need local native speakers as contacts to be updated on developments in the regulatory framework. The process is sometimes too complex to follow for foreign potential market entries (the United Kingdom is mentioned here). The fear of unexpected political influence on the regulatory framework also plays a major role in the low entry level of foreign retailers.

Overcoming the barriers

- 193 Most interviewees identified as very important the need for market designs of EU retail energy markets to be harmonised in order to reduce barriers to entry and expansion. It was frequently mentioned that it would be a powerful simplification if market entries and exits and the involved legal frameworks, licensing procedures, reporting obligations and supplier processes were harmonised throughout the EU (see Case study 3 on retail market integration in the Nordic area).
- 194 It was accepted by the interviewees that the MSs need an opportunity for particular arrangements to handle local specifics. However, it was stressed that, for this purpose, it is very important to define general principles (e.g. licensing procedures).
- 195 It is also perceived as important that all relevant documents be available in English and data exchange standardised. In addition, common requirements for the switching procedure for customers should be defined in a simple and transparent way.
- 196 Another important issue is a strong commitment to full privatisation and price liberalisation in order to prevent political influence on retail energy markets, which often run counter to sound economic principles. Various interviewees desire stricter monitoring of NRAs and the transparency of their decisions by the Agency.
- 197 Regarding gas, it was mentioned that larger bidding zones and virtual balancing zones as well as a reduction in storage obligations may help to overcome barriers to entry. However, for electricity, more market coupling and a specific harmonisation of RES support schemes seems to be promising.
- 198 Overall, the most important perceived barriers to entering retail energy markets at the EU level seem to be the lack of harmonisation of MSs regulatory frameworks, the persistence of retail price regulation, high uncertainty concerning future regulatory developments and the low liquidity of wholesale markets, particularly in the less-developed markets. The interviewees also identified low margins and stiff competition as issues in specific, more developed markets.

Case study 3: Retail market integration in the Nordic area

The energy regulators of the Nordic area¹⁰⁹ have decided to harmonise the Nordic retail markets with a view to increase and diversify product choice, enhance opportunities from switching, to achieve greater efficiency deriving from automated and simple switching procedures and to achieve greater cohesion of the wholesale and retail market.

In 2006, a non-legal entity for improving cooperation was established: the Nordic Energy Regulators (NordREG). It is based on voluntary agreements between the regulators and is supported by the Nordic ministers for energy. NordREG works towards a common harmonised retail market in the Nordic region through its working programme covering the following four areas: retail markets, wholesale and transmission, network regulation and market surveillance.

As part of its work, NordREG reviews the conditions for the establishment of the most economically beneficial common end-user market for Nordic customers. Through harmonised solutions, the main goal is to eliminate the key entry barriers for stakeholders in the electricity market, with the aim of enhancing customer involvement and choice. NordREG's view is that a harmonised Nordic retail market should be based on a supplier centric model¹¹⁰, as it is considered a model with significant advantages for the Nordic customers, electricity companies and the Nordic society generally.

Outcomes of NordREG work – A Nordic supplier centric model

Between 2006 and 2007 NordREG mainly worked on issues related to system operators handling of emergency situations, congestion management and the beginning of the development of a common Nordic balance settlement. There was also a need to establish a solid foundation for the wholesale market so that the next steps could be taken towards a Nordic retail market.

In 2008 NordREG made a study on the costs and benefits of a Nordic retail market which demonstrated net benefits, and this led to a greater emphasis on considering measures which would enable the development of a common market. NordREG developed a market design for the harmonised Nordic retail market in 2009. In line with European developments, NordREG made in 2010 an implementation plan for a Nordic retail market, a report on grid investments in a Nordic perspective and finding common ground for the implementation of the 3rd energy package.

Since 2011 NordREG has analysed different retail market models, commissioned several studies and held several public consultations that have led to the publication of several recommendations in five areas according to detected harmonisation needs. These five areas are: (i) Customers billing mechanism; (ii) Supplier switching conditions; (iii) Market players information exchange and metering reading settings; (iv) Customers / market players interface; and (v) Information exchange – a national point of information. The next steps involve the members implementing these recommendations.

In the spring of 2014 NordREG made a study into how far the members have come in the implementation towards a supplier centric model. The table below summarises the results.

109 The Nordic area – comprising of Denmark, Finland, Norway and Sweden – consist of almost 15 million electricity customers consuming about 360 TWh per year. They are provided by as much as 400 different – predominantly national – electricity suppliers, with larger companies, such as Fortum, EON and Vattenfall and a few exceptions i.e. smaller companies with customers in more than their own country.

110 A supplier centric model means that the supplier will be the stakeholder that interacts with the customer with regards to for example switching, moving and billing.

Table i. Overview of implementation progress of the supplier centric model in the Nordic countries-2014

	Information exchange	Combined Billing	Moving	Switching
DK	Data hub was introduced 2013. New version will be launched Oct. 2015.	Combined billing is planned to be introduced Oct. 2015.	The supplier has taken care of the moving processes since 1 March 2013.	Supplier centric with the implementation of the wholesale model Oct. 2015
FI	Project to investigate future information exchange model will be finished by the end of 2014. Decision on the future model will be done after that.	No legislation done or planned	Will be initiated after investigation regarding future information exchange model has been chosen.	Will be initiated after investigation regarding future information exchange model has been chosen.
NO	Establishment of data hub is underway and will be operational from Oct. 2016.	Currently being reviewed. Proposal will be delivered within 2014.	Will be changed when the data hub is operational.	Will be changed when the data hub is operational.
SE	Ei has proposed a centralized information exchange model to the Government 19 June 2014.	Ei has proposed combined billing to the Government.	Ei has proposed that the supplier should take care of the move out and move in process to the Government.	Supplier centric switching process is implemented.

Source: NordREG's work towards a harmonised Nordic retail market – Roadmap update and national implementation monitoring. NordREG, 2014

Challenges Ahead

The harmonisation towards a common Nordic retail market is scheduled to be carried out in three phases:

1. NordREG proposing recommendations after extensive consultations;
2. Nordic MSs political commitments and national decisions on their implementation; and
3. National Nordic market adaption of the recommendations.

In order to better coordinate the different recommendations, NordREG has developed a target model framework for different areas, such as, for example, billing and information exchange provisions.

When Nordic recommendations are issued by NordREG, it has been agreed that each national regulator must take them into account for developing the provisions in their individual national retail electricity market. Since the work is supported by the ministries, the policy makers will also take full account of NordREG's opinions. There is however, no common Nordic energy legislation so the implementation must be carried out in national laws which in turn demands a high level of commitment by the ministries. This makes it more challenging to set a final deadline for a fully harmonised Nordic electricity market.

NordREG's vision is that, following implementation of a harmonised Nordic retail market, all Nordic electricity customers will benefit from a free choice of suppliers and energy service companies along with competitive prices, and reliable supply and energy services through the Nordic and European electricity market.

2.4.2 End-user price regulation¹¹¹

- 199 As expressed by the surveyed suppliers in the previous section (2.4.1), regulated prices can impact the development of competition in retail markets. Price regulation may reduce suppliers' margins (even without pushing them to negative levels), as these may be set at a different level than the resulting supply and demand forces would produce. It may also dampen entry incentives, increase investor uncertainty and/or prompt consumers to disengage from the switching process. Regulated prices act as a focal point around which competing suppliers are able to cluster and – at least in markets with strong consumer inertia – this situation might considerably dilute price competition.
- 200 Regulated prices should be set at levels which avoid stifling the development of a competitive retail market. They must be consistent with the provisions of the 3rd Package, and should be removed where a sufficient level of retail competition is achieved.
- 201 This section provides: (i) an update on the status of regulated end-user prices for households; (ii) a case study 'Tariff oversight in a fully liberalised market – the Dutch experience'; and (iii) a selection of case studies with factual examples of how regulated end-user prices for households were removed in the Czech Republic, Estonia and Ireland.

Progress in 2013

- 202 According to the information received from NRAs, during 2013, end-user price regulation for electricity households was removed in two MSs (Estonia and Greece). Moreover, according to the Italian NRA, household end-user prices for electricity and gas in Italy should no longer be considered as regulated. Therefore, as of 31 December 2013, household end-user price regulation existed in 15 countries (out of 29) for electricity and in 15 countries (out of 26) for gas.
- 203 As pointed out in last year's report, the full opening of the Estonian electricity market with no price regulation for all customers was achieved from 1 January 2013.
- 204 In Greece, from 30 June 2013 electricity low voltage end-user prices (households and small enterprises) are no longer regulated¹¹². The only exceptions to this rule are end-user prices for vulnerable customers.
- 205 In Italy, a single buyer (Acquirente Unico) is responsible for procuring electricity to cover the requirements of the standard offer market (*'mercato di maggior tutela'*), i.e. to supply domestic and small business consumers who did not switch away from the standard offer (about 72% of all consumers and 25% of final energy volumes). This electricity is procured on the market and resold to standard offer retailers in accordance with directions from the NRA at prices which reflect the single buyer's recognised costs, including procurement costs. The profit margin of standard offer prices equals the cost of entry of a new entrant into the market and is based on estimates provided by the single buyer and the Italian NRA. According to the latter, Italian standard offer prices (i.e. reference prices) are based entirely on market conditions and do not distort competition among suppliers. However, the standard offer prices may still be a focal point for suppliers and be considered by consumers as a "safer" option than competing offers, including by new entrants. In this respect, standard offer prices,

111 In this report, a regulated end-user price is considered as a price subject to regulation or control by a public authority (e.g. government or NRA) as opposed to a price determined exclusively by supply and demand. This definition includes many different forms of price regulation, such as the setting or approval of prices by an authority, the standardisation of prices or combinations of these.

112 This is based on law 4038/2012. Prior to this change, electricity retail prices were regulated by a decision of the Ministry of Environment, Energy and Climate Change, after the Regulatory Authority for Energy's recommendation, according to law 4001/2011.

while not necessarily distorting competition between suppliers, may still reduce the propensity of consumers to switch towards better offers. A similar approach was introduced in Spain in December 2013 (see paragraph (214) below).

- 206 In 2013, the liberalisation of the electricity market in Portugal entered its final stage with the phasing out of regulated tariffs for household consumers, with a view to creating conditions for effective competition. However, there is a transition period until the end of 2015 for low-voltage customers with contracted power not exceeding 10.35 kVA, i.e. mainly households. During the transitional period, customers who have not yet chosen a supplier in the market will continue to be supplied by the energy supplier of last resort at a transient rate fixed by ERSE, the Portuguese NRA. On this period, ERSE will publish, transitory tariffs every quarter. Economically vulnerable customers retain the right to be supplied at regulated prices.
- 207 In most MSs where price regulation still exists, the regulator sets the level or methodology of the regulated price, but in Belgium, France, Greece, Hungary and Spain, these are set by the government, while the regulator only gives an opinion.
- 208 Most EU MSs maintain a dual market structure where regulated and non-regulated markets are present: in these countries, household consumers have the choice of being supplied at regulated prices or the liberalised market price. However, the option to switch to market prices is still not possible for gas households in Bulgaria, Greece and Latvia.
- 209 Despite the fact that, in the majority of MSs, switching to unregulated price is possible, most household consumers continue to stay on regulated prices. The relative level of prices determines consumers' incentives to switch between the regulated and non-regulated segment of the market. If the regulated price is lower than the liberalised market price, consumers have no incentive to switch to unregulated prices and vice versa. In a number of European countries, particularly in Eastern Europe, regulated end-consumer prices have historically been below cost; therefore, little scope has existed for an unregulated competitive market to emerge.
- 210 Special regulated prices for vulnerable consumers aimed at protecting low-income consumers who spend a large proportion of their incomes on energy exist in several countries (i.e. ten in electricity and three in gas), but the percentages of consumers paying these special tariffs are relatively low.
- 211 Latvia, Lithuania, Poland and Slovakia have adopted roadmaps for the removal of price regulation in electricity. In Romania, under the power price deregulation calendar, the share of electricity delivered at liberalised market prices was introduced in six stages for industrial consumers from September 2012 to 2013 and in ten stages for households between July 2013 and the end of 2017. A number of other countries (e.g. France and Romania) are also working towards the removal of price regulation. In Spain, on 27 December 2013, the new Electricity Act modified the last resort tariffs for electricity and introduced the PVCP (Precio Voluntario Pequeño Consumidor or Voluntary price for small consumers) for electricity households. This price includes the energy cost (price resulting in the spot market during the period), access tariffs and other charges. In Denmark, according to the proposal¹¹³ deregulation in 30 of the 39 default supplier areas will take place by 1 October 2015 in conjunction with the termination of the new tendered obligations of supply. For the remaining 9 areas, the regulation will end in May 2017, when the old obligations to supply the default supplier product expire.

- 212 Roadmaps for the removal of retail price regulation in the gas household market are also in place in several MSs. Ireland has set clear dates for price deregulation (the latest competition review from the CER indicates that deregulation of the sector could take place in July 2014), while Romania proposed a calendar for phasing out regulated prices from mid-2014 (for industrial consumers) and end 2018 (for households). These roadmaps show that their removal at the European level will be achieved sooner in electricity than in gas, as MSs are showing more commitment to removing regulated electricity prices. In 2013, the liberalisation of the gas market in Portugal entered its final phase with the phasing out of regulated tariffs for household consumers, with a view to creating conditions for effective competition. However, there is a transitional period until the end of 2015 for low-pressure customers with an annual consumption below 500 m³, essentially households. During this transitional period, customers who have not yet chosen a supplier market will continue to be supplied by the energy supplier of last resort at a rate fixed by the ERSE transient. In this period, ERSE will publish transitory tariffs every quarter. Economically vulnerable customers will retain the right to be supplied at regulated prices.
- 213 In a minority of MSs (e.g. Great Britain, Germany, the Netherlands, the Czech Republic, Slovenia and the Nordic countries) retail prices are fully liberalised, and there is no government intervention apart from social security policies.

Case study 4: Tariff oversight in a fully liberalised market – the Dutch experience

Introduction

'Tariff Surveillance' was introduced with the liberalisation of the Dutch retail energy market in July 2004¹¹⁴ because of the concern that a sizeable group of consumers might not take advantage of the opportunity to change supplier, and could therefore be vulnerable to unreasonably high tariffs once the market opened. Still today, ACM observes that, even with potential savings as high as 314 euros, 56% of consumers have not changed supplier. Tariff Surveillance requires all (new) tariffs to be submitted to ACM, which may assess them. If ACM deems a specific tariff unreasonably high, it may set a maximum tariff. The combination of opening up the retail market for competition and arranging some sort of safety net to prevent unreasonably high tariffs required a balanced approach to the implementation of the legislation.

Principles

In implementing the legislation, ACM defined several principles that must be applied to Tariff Surveillance in a liberalised retail market. The basic principle is that Tariff Surveillance should be implemented with as little effect as possible on the development and functioning of the market. This means that suppliers should be able to set their tariffs freely, within the range of what is reasonable.

Moreover, price differences are necessary in order to motivate consumers to choose different suppliers or contracts. Additionally, the implementation minimises the impact on suppliers' product definition and innovation.

114 The Dutch Electricity Act (Section 95b) and the Dutch Gas Act (Section 44) provide the legal basis for this scheme.

With these principles in mind, Tariff Surveillance is designed as a safety net that shaves off the edges of the price spectrum, thus preventing unreasonably high tariffs where competition does not already do so.

Implementation

To mitigate the effect on the suppliers' price-setting, ACM initially assesses the reasonableness of tariffs based on an undisclosed benchmark model which incorporates wholesale prices, operational and capital expenses, and a reasonable margin. The model is undisclosed to avoid the risk of becoming a 'focal' point in price-setting behaviour for certain groups of customers. This applies especially to customers not active in the market.

Suppliers are free to set any tariff they wish, and to offer them on the market. However, they have to submit all tariffs to ACM for assessment. Tariffs are initially assessed with the general benchmark model. Modelling a reasonable tariff in a dynamic and complex environment, such as the energy sector with continuous product innovation, requires extensive investigation after the initial assessment. This investigation may be completed by ACM concluding that the specific tariff is not unreasonable. Alternatively, the retailer may decide to change the initial tariff. In 2013, this happened in only two cases (out of thousands of individual tariffs). ACM has never needed to use its ultimate power to set a specific maximum tariff. ACM highlights tariffs only if they seem unusually high, and does not approve tariffs that are not. In practice, this procedure means that the conclusion that a tariff is unreasonably high is always drawn ex post.

ACM recognises that Tariff Surveillance can have a potential impact on market initiatives. However, the Dutch market shows that, in practice, Tariff Surveillance offers enough room for tariff differentiation. For instance, ACM's energy report for the second half of 2013 reveals that, for all types of contracts (permanent or fixed-term contracts), price differences are substantial¹¹⁵. Also, the existence of Tariff Surveillance does not cause a barrier for new suppliers to enter the market. As of 31 December 2013, there are 43 suppliers for gas and electricity on the Dutch market. Serving just over 7 million household connections, this number can be considered high. Furthermore, Tariff Surveillance has little effect on the room for developing new and innovative products, since ACM updates the benchmark model continuously because of changing market circumstances, and ACM seeks practical ways to facilitate the introduction of innovative price concepts, such as prices based on daily spot market prices or competitor's prices.

Recent developments

In 2004, the Dutch legislature considered that a group of consumers would not take advantage of the opportunity to change supplier once the market had opened. Even today, 56% of consumers have not changed supplier. Therefore, this group of consumers is potentially vulnerable to unreasonably high tariffs. Besides getting the basics right (billing and switching procedures), it is very important that these consumers become active in order to stimulate competition. ACM focuses on what is needed to enable these consumers (and other consumers) to make a well-informed and conscious choice. Based on ACM's research, consumers lack simple, clear, easily comprehensible and comparable offers, contracts and bills in order to make a well-informed and conscious choice¹¹⁶. Empowered consumers enhance competitive pressure on suppliers, who risk consumers switching away if prices are too high.

¹¹⁵ In the case of electricity and natural gas (dual-fuel), the price difference between the costliest and the cheapest permanent contract (measured in March 2014) was 169 euros per year. In the case of fixed-term contracts, price differences varied between 69 and 314 euros, depending on term lengths.

¹¹⁶ See also the Dutch case study on switching (Case study 2).

Path to deregulation

- 214 This section provides a selection of case studies with factual examples of how regulated end-user prices for households were removed in the Czech Republic, Estonia and Ireland. These case studies were drafted by NRA experts from these countries.

Case study 5: The path to deregulation in the Czech electricity market

The liberalisation of the Czech electricity market is governed by Act No 458/2000 on the conditions of business and state administration in the energy industries, which is based on Directive 2003/54/EC. Opening the electricity market means in practice that the originally protected consumers whose electricity prices were set by the NRA (the Energy Regulatory Office) every year, have turned into eligible consumers with the right to select their electricity supplier. For these customers, only the network component of the resulting electricity price is still subject to regulation.

Directive 2003/54/EC, which was transposed into the Energy Act, required the ownership or at least strong legal unbundling of the regulated activities of electricity transmission and distribution from electricity generation and sales, which are not subject to regulation. This requirement was imposed on the incumbent integrated power companies in the Czech Republic.

Full market opening and removal of price controls

The opening of the electricity market in the Czech Republic started on 1 January 2002. Since then, the various categories of what had originally been protected customers have gradually become eligible consumers with the right to select their electricity supplier. The electricity market, offering supplier switching opportunities, was opened for customer categories as follows:

- From 1 January 2002, consumers with an annual consumption of over 40 GWh;
- From 1 January 2003, consumers with an annual consumption of over 9 GWh;
- From 1 January 2004, all consumers with continuous metering of consumption, except for households;
- From 1 January 2005, all final consumers except for households; and
- From 1 January 2006, all final consumers including households.

The full opening of the electricity market created the need to inform final customers about the opportunity to switch their supplier and also, and above all, about the process of migrating to a different supplier. The Energy Regulatory Office therefore posted on its website easy-to-follow guidance for final household consumers in case they decided to switch their electricity supplier. The Office also posted a list of electricity traders from which consumers could select their supplier.

In connection with the completed process of opening the electricity market and the Energy Regulatory Office's effort to provide consumers with the most comprehensive information for their decisions on supplier selection, the Office also posted an interactive ready-reckoner of electricity supply tariffs. Using this application, low-demand consumers connected to the low-voltage level can compare, on the basis of the details entered (the distribution rate, the annual consumption), the costs of electricity supply from various suppliers, and find the best supplier in relation to the nature and size of their demand.

Customer protection measures

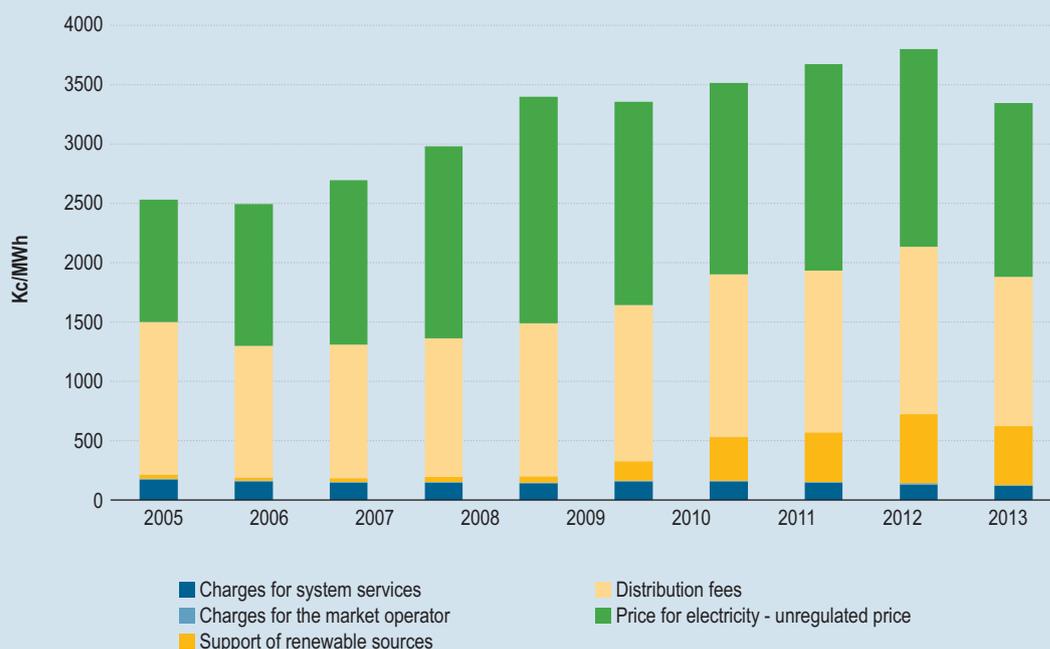
In the wake of increasing competition in the market, electricity traders initially used relatively aggressive methods to acquire customers by way of peddling (i.e. door-to-door selling) and fixed-term contracts, which had not been used until then. For many customers who were not knowledgeable about the energy sector, when pressured by multiple peddlers and having terminated an already executed fixed-term contract, this meant having to pay penalties to the original trader.

Therefore, the Energy Act was amended to include a provision reflecting the above developments and establishing certain rights for consumers to protect them, and imposing certain matching obligations on traders. Under this provision, traders must publish, in a way enabling remote access, their terms and conditions of gas and electricity supply and their gas and electricity supply prices no later than 30 days before the effective date of any changes thereto. The provision also requires traders to allow consumers a non-discriminatory choice of the method of payment for their gas or electricity supply. When billing advance payments for gas or electricity supply, traders must set advance payments proportionately to consumption in the preceding comparable billing period, but not exceeding the gas or electricity consumption reasonably expected in the next billing period.

Main developments

Figure i below shows the trend in prices from 2005, when there was a gradual opening of the electricity market for businesses and then, from 2006, for all consumers. The chart shows the evolution of the unregulated price of energy and regulated components of the final retail price – i.e. distribution feeds, charges for system services and market operator and support of renewables sources. These values imply a gradual price increase for consumers in this category (i.e. consumers on low voltage – households and small businesses). In 2014, some regulated components, especially distribution prices, but also prices to support renewables, were reduced.

Figure i: Development of prices for retail consumers – 2005–2014 (Kc/MWh)



Source: Energy Regulatory Office (2014)

Competition has evolved in the retail market, with more and more businesses seeking to supply electricity to customers. In the wake of the market’s opening, suppliers mainly relied on door-to-door sales; however, they currently resort to advertising campaigns, participation in mass-scale electronic auctions for groups of consumers and the acquisition of weaker competitors in order to expand.

In 2013, the number of consumers switching suppliers (see Figure i) dropped by approximately 100,000 on a year-on-year basis, following a few years of increasing supplier switching rates. This situation can be attributed to the fact that consumers cannot terminate fixed-term contracts, such terminations being liable to high penalties, and also the saturation of the market, where many customers have already selected the energy supplier that is best for them.

Figure ii: Switching activity – 2005–2013 (total number of switches and %)



Source: Energy Regulatory Office (2014)

The Energy Regulatory Office currently registers some 380 licences awarded for trading in electricity, but only 50 of these traders supply electricity to more than 100 supply points. Therefore, these traders can be regarded as active electricity suppliers focused on low-demand customers. The largest number of consumers are supplied by the dominant electricity suppliers, who are legally unbundled, but still vertically integrated with distributors in terms of ownership. Since 2006, especially two “new” traders, Bohemia Energy entity, s.r.o. and Centropol Energy, a.s. increased the number of consumers significantly. These companies supply electricity to approximately 300,000 supply points.

Summary

The Czech electricity market was fully liberalised on 1 January 2006. On the supply side, the market shows active suppliers who apply different selling strategies and engage in take-overs, while two new suppliers entered the market. In 2013, the demand side saw a gradual stabilisation of consumer switching compared to 2012. The end price for customers did not decrease, primarily due to the high level of support for renewable energy sources, which is part of the non-contestable component of the final price.

Case study 6: Path to deregulation – Estonia (electricity market)

Prior to the full opening of the electricity market in 2013, a campaign to raise consumer awareness was organised and run by the Government. This campaign, from November 2011 to January 2013, included advertising, direct mailing, brochures, publications webpage, regular public opinion surveys, event marketing (i.e. a promotional strategy that involves face-to-face contact between companies and their customers at special events like concerts, fairs, and sporting events) and a telephone information service. The campaign provided consumers with practical information and was targeted to all residential consumers, including consumers in rural areas, elderly people, the Russian-speaking population, young people and business consumers.

The phases of the campaign were:

- Phase 1: presenting the opening of the electricity market – energy security, obligations arising from European Union membership, competition;
- Phase 2: how to be prepared: monitoring energy consumption, consider ways to save energy, what the electricity bill consists of;
- Phase 3: practical information for consumers: what to keep in mind when choosing a supplier, switching supplier; and
- Phase 4: follow-up: actual process of opening the market; how to respond when consumers took no steps before market opening.

A logo for the opening was branded. More than 20 suppliers signed a good-will agreement. A public webpage (www.avatud2013.ee) was created and a banner campaign launched. Quarterly studies were done on the risks and awareness of consumers; booklets and special edition hand-outs added to national and local newspapers; cooperation with Estonian National Broadcasting and articles, interviews; continuous press releases were developed.

The subsequent removal of regulated retail prices

In connection with the market opening in 2013, an information exchange platform (data warehouse) was created in 2012, which was an important precondition for enabling Estonian electricity consumers to switch electricity suppliers. The data warehouse is a digital environment administered by a system operator. Through the data warehouse, information exchange on the electricity market takes place in order to change the supplier and transmit the metering data. The data warehouse ensures that switching is effective and takes into account the principles of equal treatment.

The Electricity Market Act was amended to protect consumers and introduced a universal service regulation. The aim of this service was to avoid household consumers (i.e. those with a low voltage connection and a main circuit breaker of up to 63A) being left without an electricity supply if they did not choose a supplier.

Universal service is the selling of electricity to household or small consumers by the network operator or by a seller designated by the network operator on the basis of the standard conditions for universal service approved by the Competition Authority. The price for universal service is formed according to the market or power exchange price, to which justified cost and reasonable profit are added by the network operator/seller. The Competition Authority is obliged to verify justification of the latter. The seller is required to disclose the basis for price formation every month, by the 9th day of the subsequent month.

The main developments in the market since (full) price deregulation

The opening of the electricity market brought along many new electricity suppliers, which has made the market more competitive, and consumers have freedom of choice. In 2012, there were five independent suppliers and, in 2013, 15, and 34 network operators licensed to sell electricity.

Since the opening of the market, the market share of the biggest electricity market supplier, Eesti Energia AS, has decreased, from 79.4% in 2012. In 2013, the balance portfolio of Eesti Energia AS was on average 71.9%, and in January 2014, approximately 60%. The rate of consumer switching was 5% in 2013 for the household and small business market.

In 2012, the average regulated electricity price in Estonia was 3.15 cents/kWh, but in 2013, there was a remarkable increase in the price. In 2013, on the open market (Nord Pool Spot Estonia area), the average price was 4.31 cents/kWh. Thus, the electricity price increased by approximately 37% in 2013 compared to 2012. In the first half of 2014, the average electricity price was 35.27 cents/kWh. The decrease in price was mainly affected by the launching of EstLink2 undersea cable between Estonia and Finland.

EstLink2, which became operational at the beginning of 2014, increased the electricity transmission capacity between Estonia and Finland by nearly 1,000 MW. Opening a second undersea cable will not necessarily mean a more favourable price for electricity in Estonia, but will result in the price equalisation of the Estonian and Finnish stock exchanges on the Nord Pool Spot market. According to data from the Nord Pool Spot, power exchange prices in Estonia and Finland were the same on the day-ahead market for 97.8% of the time in May; the same indicator in April showed an equivalence for 96.8% of the month.

Summary

In the assessment by the Competition Authority, the opening of the electricity market in Estonia began successfully. The open electricity market along with the stronger connections with Nordic countries enable stronger competition between producers, more transparent and lower prices for consumers and ensures the fulfilment of the preconditions for a well-functioning electricity market.

Case study 7: Path to deregulation – Ireland (electricity and gas markets)

Background

Historically, in Ireland, electricity and gas were supplied to all customers connected to the electricity and gas distribution network by the state-owned incumbents, ESB and Bord Gáis Eireann, respectively.

In the mid 1990s, the EU set out requirements for MSs gradually to open up their electricity and gas markets¹¹⁷. In February 2000, as a first step in this process, the Irish electricity market was opened to allow customers using 4GWh or more of power per year to choose their own supplier. With resulting positive developments and increased levels of competition, market opening gradually increased and

117 EU Directives 96/92/EC, 2003/54/EC and 2009/72/EC.

all segments of the market were opened to full retail competition in 2005.

During this period, the Commission for Energy Regulation (CER) continued to regulate each of the incumbent supplier's electricity and gas tariffs through the setting of annual allowable fixed revenue, which was largely based on numbers of consumers.

Recognising the increased level of competition in the Irish retail electricity market, changing market dynamics and the progressive transition to a fully deregulated market, CER set out proposals on changes to the form of regulation to apply until such time as all markets had been deregulated. A key consideration in this process was the CER's commitment to retaining appropriate regulatory controls to support competition and protect domestic consumers. Tariffs continued to be set on a cost-reflective basis, in a transparent framework, with continued regulatory oversight.

This process, along with transposition of the 3rd Package, which underpinned the transition of the regulatory system from an ex-ante to an ex-post one, with the CER having expanded market monitoring, ultimately led to full deregulation of the electricity market and gas market in April 2011 and July 2014, respectively.

The roadmap to deregulation

In 2009, CER consulted on proposals for a roadmap for deregulation¹¹⁸. Subsequently, in April 2010 and June 2011, CER published its decision on the deregulation of the Irish retail electricity and gas markets, respectively¹¹⁹. The Roadmap set out the competitive milestones for the deregulation of business and domestic energy sectors, ending the obligations of price control, with regulated tariffs, on the incumbent energy suppliers^{120,121}.

With the key considerations of supporting competition and protecting consumers to the fore, CER set out the following criteria to decide on the deregulation of the specific markets in both electricity and gas:

- (i) A market must have at least active three suppliers active; and
- (ii) A market must have a minimum of 2 independent suppliers, each of which has at least a 10% share¹²²; and
- (iii) For electricity, for each of the business markets, ESB supply companies must have a percentage market share of 50% or less; in the domestic market, the percentage market share is 60% or less, conditional on the removal of the ESB brand from the retail market. For gas, BG Energy's non-domestic sector share by volume must be less than 50%; in the domestic market, this share is 60%, or 55%, conditional on the rebranding of BG Energy.

118 See: <http://www.cer.ie/docs/000818/cer09189.pdf>.

119 In the gas Roadmap, while they are the same as electricity, the criteria were indicative. This was finalised in April 13, See: CER/13/096.

120 For gas, this is a discretionary power conferred on the CER in Section 6 of the Gas Act 2002.

121 The unbundled entities of ESB Customer Supply, ESB Primary Energy Supply and Bord Gáis Energy.

122 In electricity, the independent supplier must have at least a 10% share of the load (GWh) in the relevant market. In gas, each must have at least a 10% share of volume consumption for the Fuel Variation Tariff and Non-Daily Metered Industrial & Commercial markets or a 10% share by consumer numbers in the Residential market.

(iv) Switching rates must be greater than 10% in the domestic market for both electricity and gas.

In conjunction with the Roadmaps, CER published detailed competition reviews. These reviews set the criteria against the various markets to determine if the threshold as set out in the Roadmap to Deregulation had been met. This review concluded that: (a) the electricity and gas business markets had met the criteria and, therefore, were deregulated in October 2010 and Oct 2011, respectively and; (b) the retail domestic markets had not yet met the threshold and therefore CER would continue to monitor competition in this regard until the threshold for deregulation had been met.

Next steps for the roadmap to deregulation

CER recognised the need to convey to stakeholders the specific steps and work involved to deliver and sustain market deregulation, specifically by providing them with the relevant information about the regulatory environment and the coming changes in order to avoid regulatory uncertainty. In June 2010 and in May 2013, for the electricity and gas markets, respectively, CER published the 'Next Step for the Roadmap to Deregulation' which set out the work programme to be followed by CER and the associated timelines. Specifically, the work programme covered the following key areas: legislation and licence changes, a consumer communications plan, domestic tariff regulation, competition reviews, consumer protection consultation, supplier rebranding, market monitoring and global aggregation¹²³.

CER considered that the ultimate aim of deregulation is to benefit consumers, so the work programme places particular emphasis on consumer protection issues and associated suppliers' obligations. CER consulted specifically on this topic, so that decisions in this regard could be incorporated in parallel with the deregulation process¹²⁴.

Full deregulation and consumer protection

In its decision paper Domestic Market Deregulation, published in March 2011, CER confirmed that all deregulation criteria had been met and the final phase of the deregulation of the retail electricity market would occur on 4 April 2011. It was noted that in the previous competition review it had expected that the incumbent electricity supplier (now known as Electric Ireland after successfully being rebranded) would have met the 60% threshold for the domestic market by April.

Similarly, based on the latest competition review from CER, the criteria for the deregulation of the domestic gas market had recently been fulfilled. As a result, deregulation of the sector took place on 1 July 2014 (BGE met the 55% threshold for domestic market share).

Further to the outcome of the customer protection consultation process, CER decided to implement a number of additional measures to ensure customer protection in the deregulated market. The measures are designed to provide customers with the information they require to actively engage with the market and benefit from competition. The decisions that placed obligations on suppliers are collated and prescribed in the Electricity & Natural Gas Suppliers Handbook published by CER¹²⁵.

123 See: <http://www.cer.ie/docs/000207/cer10083.pdf> and <http://www.cer.ie/docs/000002/cer13123a.pdf>.

124 See: <http://www.cer.ie/docs/000004/cer11057.pdf>.

125 Specifically, the Handbook sets out requirements under Condition 18 of the Electricity supply licence and Condition 21 of the Natural Gas Supply Licence when preparing terms and conditions of supply (for household consumers), their Codes of Practice and Customer Charters.

Conclusion and future arrangements

All business market segments in electricity and gas have been fully deregulated for the past number of years. The domestic electricity sector has been fully deregulated in Ireland since April 2011 and, most recently, the domestic gas market in July 2014. Since the full deregulation of the electricity market, there has been a significant increase in the levels of consumer switching between suppliers, which were some of the highest in Europe¹²⁶. To ensure that consumers benefit fully from the deregulation of the electricity and gas markets, it is important that CER adequately monitor competition on an on-going basis (as provided for in legislation)¹²⁷.

In December 2013, CER published a consultation paper which proposed an enhanced market monitoring framework¹²⁸. This paper outlines CER's proposals with regard to the indicators that it proposes to collect from suppliers and networks to form a new market monitoring framework. Best practice guidelines were used as building blocks for the framework (ERGEG guidelines). In addition to these best practice guidelines, CER took into account the specifics of the Irish retail markets, leading to a tailored framework for this jurisdiction. The subsequent decision paper in this regard was published in July 2014, and CER plans to implement the additional market monitoring requirements over the next year.

Consumer protection is a key obligation of CER's remit in a deregulated market place. Therefore, alongside market monitoring, CER has: (a) set up regular consumer stakeholder meetings to inform stakeholders of CER's upcoming work streams and any public consultations that will be held over the following months that are of relevance to domestic consumers, while providing an opportunity for more active participation in CER's consultation process; (b) as provided for in legislation, a dispute resolution service for consumers with an unresolved dispute with their supplier or network operator, which also allows CER to gauge levels of consumer satisfaction in the market; and (c) commissioned annual consumer surveys to further aid CER's understanding of consumers' opinions.

In conclusion, the CER recognises that the deregulation of the electricity and gas markets has had a positive impact on consumers in Ireland through competitive pricing¹²⁹. However, there is still a need to ensure that this remains, and equally, that consumers are protected in an increasingly competitive market. CER is committed to continuing this work through the consumer care functions and the enhanced market monitoring proposals outlined.

126 See: MMR 2012, page 151.

127 S.I. No. 450 of 2010 – European Communities (Internal Market in Electricity) Regulations 2010.

128 See: [http://www.cer.ie/docs/000885/Market%20Monitoring%20in%20the%20Electricity%20and%20Gas%20Retail%20Markets%20Consultation%20Paper\(CER13302\).pdf](http://www.cer.ie/docs/000885/Market%20Monitoring%20in%20the%20Electricity%20and%20Gas%20Retail%20Markets%20Consultation%20Paper(CER13302).pdf).

129 According to the ACER/CEER MMR 2012 report, Ireland had the highest switching rates in Europe, and price competition was intense (highest potential savings from switching suppliers).

2.4.3 Demand-side flexibility

- 215 Integration of demand-side flexibility (DSF) is an important component in the EU's strategy for a transition towards a low-carbon economy¹³⁰. At the EU level, DSF is firmly grounded in the Electricity Directive¹³¹ and the Energy Efficiency Directive¹³². It should result in significant efficiency gains, as well as improve the functioning of IEM. The Agency has commissioned a study to assess the state of play of DSF, which identifies these (potential) benefits based on existing literature on electricity and gas. This section summarises the findings of the study¹³³.
- 216 The study distinguishes between implicit DSF and explicit DSF. Implicit DSF means flexibility that is implicitly valued, e.g. when consumers choose to change their consumption in response to time-based price signals. Explicit DSF, often called demand-side response (DSR), means flexibility that is explicitly rewarded in the market, e.g. when customers are requested to change their demand in response to a system operator signal. The distinction is blurred in the case of real-time prices.
- 217 Within this dichotomy, DSF takes several forms. DSF may include demand change, time-shifting demand, embedded generation, fuel substitution and efficiency schemes. It may also be distinguished by its purpose, its means of operation and the speed and duration of response. In electricity, DSF is characterised by short response times and relatively short durations of response. Usually, the shortest timescales of response require DSR, since implicit DSF does not usually operate at that level. In gas, useful response times and durations of response are longer, since balancing takes place over a whole day.
- 218 Flexibility of various forms delivers several valuable services in energy systems, such as reliability, and the efficient balancing of supply and demand. DSF is one of several methods of delivering flexibility in energy markets, but can have a comparative advantage in delivering flexibility on particular timescales. As with other sources that provide flexibility, DSF can simultaneously provide several valuable services to energy markets and systems, such as congestion management, peak-load shaving, and short-term balancing.

2.1.1.1 State of play

- 219 The report surveyed the NRAs of the MSs on DSF for electricity and gas¹³⁴. There is a significant variation in the penetration of DSF across the MSs. DSF is more common for electricity than for gas. In general, countries that have schemes already in place or are currently planning to implement such measures have a relatively higher level of energy consumption.

130 EC (2012a), Making the internal energy market work, COM(2012) 663 final, 15 November 2012. EC (2011), Energy Roadmap 2050, COM(2011) 885.

131 Directive 2009/72/EC, of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (OJ 2009 L211/55).

132 Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (OJ 2012 L315/1).

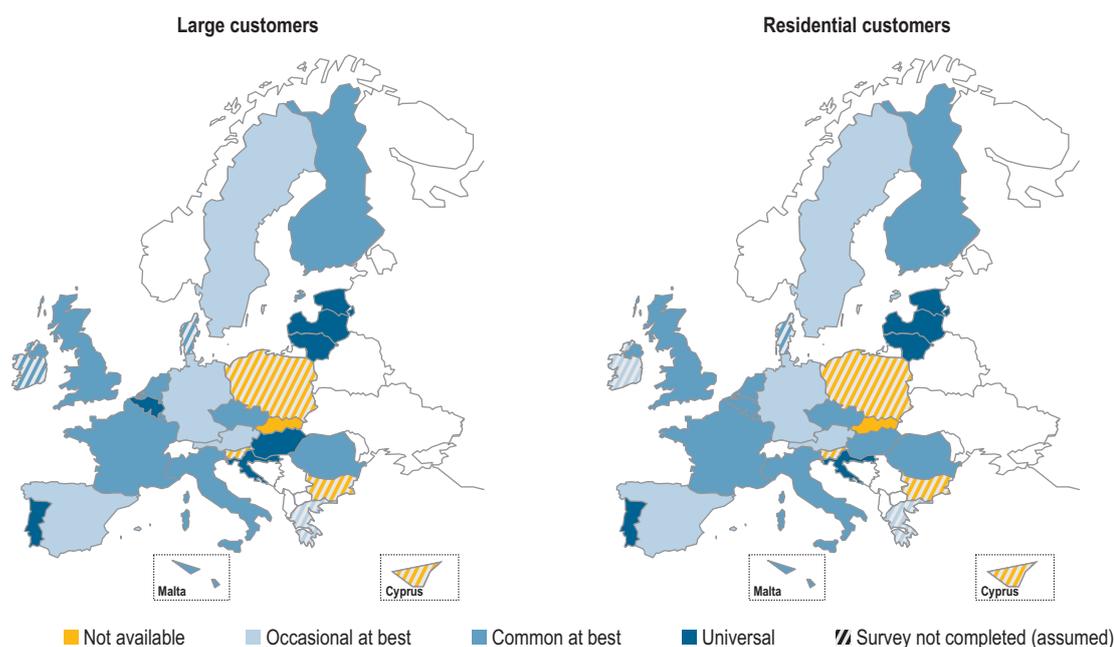
133 CEPA (2014), Demand Side Flexibility – The potential benefits and state of play in the European Union, October 2014 See: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/References/DSF_Final_Report.pdf.

134 Not all NRAs responded to the questionnaire used for this study. In those cases, the presented results are based on publicly available data or conservative estimates. These may underestimate the penetration of demand-side flexibility. Moreover, the presented results are weighted by total energy consumption per MS.

Electricity

- 220 There is a significant variation in the penetration of DSF for electricity across the MSs. Time-based prices are available to all categories of consumers in 90% of MSs. These products are used more frequently by large and medium consumers than for residential consumers (commonly used in 55% and 45% of MSs respectively).

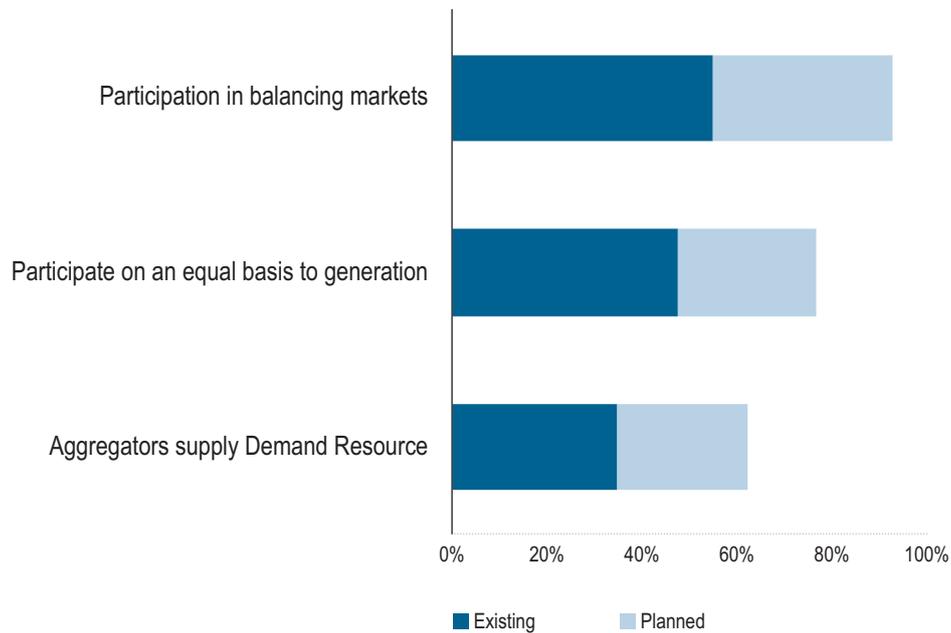
Figure 31: Time-based electricity prices by customer group in Europe – 2013



Source: CEPA (2014)

- 221 Based on those MSs with at least 'occasional' availability, the study assesses that time-based prices are available to some extent, in principle, to 92% of EU customers. The most common type of time-based prices are on/off-peak, which are commonly available in 60% of MSs. MSs where on/off-peak prices are common account for approximately 80% of total electricity consumption. Time-based network tariffs are less common than time-based prices, but still commonly used in 45% of MSs. On/off-peak tariffs are again the most common form of time-based network tariff variation.
- 222 The survey responses also covered demand-side participation in wholesale and balancing markets. In addition to MSs where participation is already possible, a significant number of MSs stated that they are currently developing plans for demand-side participation in these markets.
- 223 In over 50% of MSs, demand response can already participate in the wholesale market, while participation is planned to be introduced in another 30% of them. However, participation is not always on an equal basis with generation and is still not always possible via demand-side aggregators (possible or planned in 65% and 70% of MSs, respectively).
- 224 The picture for demand-side participation in balancing markets is broadly similar. Participation is possible or planned to be introduced in 55% and 40% of MSs respectively. Participation on an equal basis with generators is possible in nearly 50%, and via aggregators, in 35% of MSs. The opportunity for participation via aggregators is therefore relatively lower than for the wholesale market.

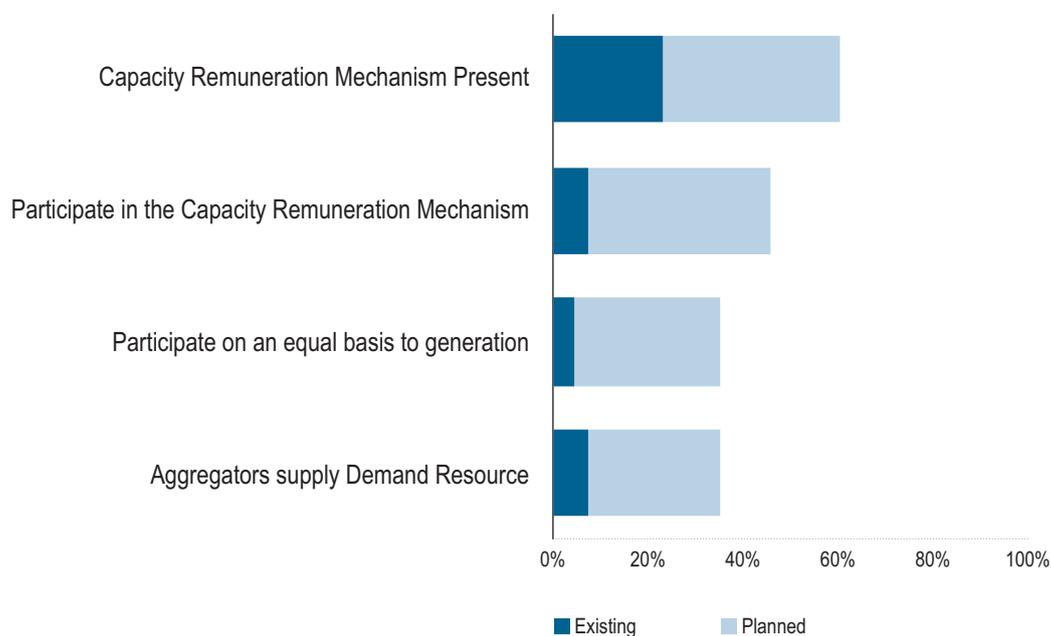
Figure 32: Demand participation in balancing energy markets (% of MSs) – 2013



Source: CEPA (2014)

- 225 Demand-side resources can participate in the market for balancing reserves in 40% of MSs, with another 20% of them currently developing plans for participation. Participation is mostly on an equal basis with generation. It is most common and most commonly planned to be introduced in the markets for secondary and tertiary reserves, but closely followed by the market for primary reserves. Participation in the reserve markets via aggregators is possible in 50%, and planned to be introduced in another 10%, of MSs.
- 226 Nine MSs have some type of a capacity market in place, and another three are planning some form of such a mechanism. When weighting the responses by energy consumption, approximately 40% of MSs are in the planning stage, while 10% already have a capacity market with demand-side participation. The capacity markets in the MSs are at different stages of development, and details may still change as the schemes are being developed. Participation on an equal basis with generation and via aggregators is possible or planned in about half of the countries with plans for a capacity market.

Figure 33: Demand participation in capacity markets (% of MSs) – 2013



Source: CEPA (2014)

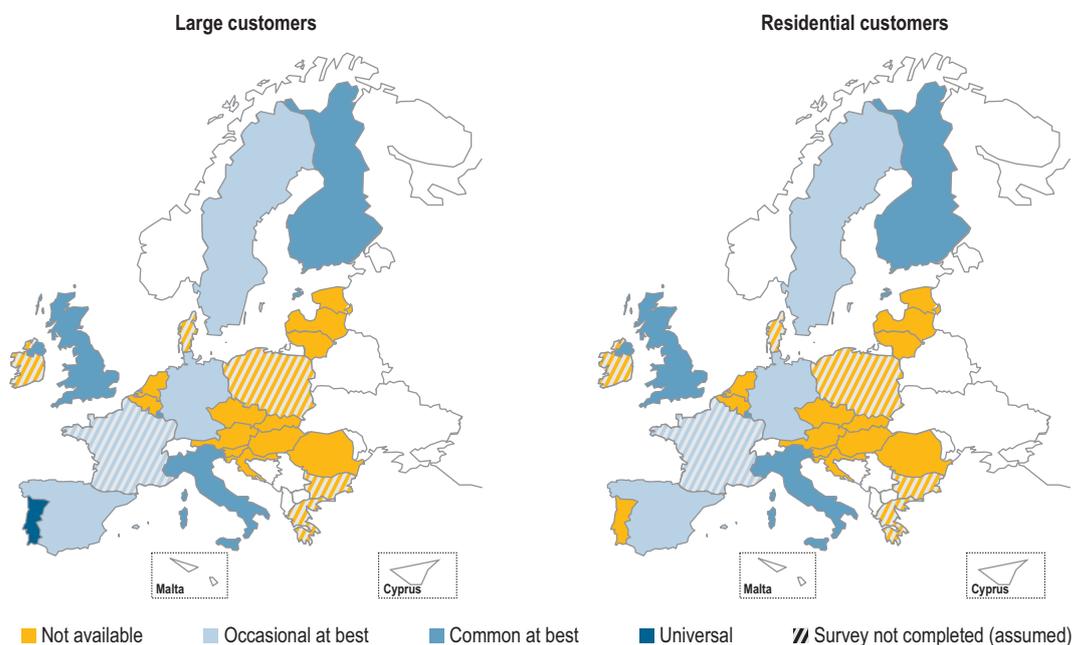
227 The study pointed to a number of other options for explicit demand-side participation, which are already used or currently under development in the MSs in addition to participation in wholesale market, balancing market and balancing reserves. These other options include, for example, programmes led by the distribution network operators. Depending on their type, demand-side resources can participate in at least one mechanism in 30%–60% of MSs.

Gas

228 DSF is less common for gas than for electricity. The availability and take-up of time-based gas prices varies significantly between consumer classes. Time-based prices are common for large consumers in 45% of MSs. They are also available to medium consumers, but commonly used in only 10% of MSs. For residential consumers, time-based prices are available in 10% of the MSs, where they are common but not universal. The most common type of time-based prices are seasonal. A range of other time-based prices types exist, including day-of-week and on/off-peak prices.

229 Time-based network tariffs are less common than time-based prices. They are commonly used in less than 25% of MSs, mainly by large and medium consumers, and less often by residential consumers. Seasonal network tariffs are the most common form of time-based network tariff variation. Other types of time-based network tariffs are used in only a few MSs.

Figure 34: Time-based gas supply tariffs by customer group in Europe



Source: CEPA (2014)

230 The NRAs also reported on the use of interruptible gas contracts in the MSs. There is a variety of arrangements for interruptions and reductions in place among the MSs. The most common types are reductions and interruptions called directly by the DSO or TSO, which are available in 50% of MSs; interruptions called by suppliers are available in 20%, while the potential participation of aggregators is reported in only one MS (Italy).

2.1.1.2 The potential benefits of DSF

Electricity

231 Implicit DSF has the potential to reduce energy use and reduce the level of peak demand through greater efficiency in the use of energy. Among smaller users, these benefits will most likely be facilitated by the smart metering programme, which is being rolled out in most MSs. Table A5 (in annex 8) summarises studies making estimates of the potential benefits from reliance on implicit DSF in the EU.

232 MSs have come to different views of the scope for energy savings, and the value of that, from smart meters in their own countries. The average energy saving is 3% of affected demand, implying a simple resource cost saving of 3 euros/kW/yr of peak demand (which would imply 1.5 billion euros/yr applied across the EU). GB has found that the value of the energy saving would be worth 6 euros/kW/yr in Great Britain¹³⁵, (which would imply 3 billion euros/yr if replicated across the EU), even though GB projects only a 2.2% energy saving¹³⁶. This implies that GB found a wider range of benefits from this energy saving than others. Including those wider costs and benefits which MSs took

135 See EC COM(2014) 356 as quoted in Table 1.1. This is the energy effect excluding the costs of smart metering and the administrative benefits of smart metering such as remote reading and (dis)connection.

136 EC SWD(2014) 189 Cost-benefit analyses & state of play of smart metering deployment in the EU-27 at Figure 9.

into account, some MSs have not found a cost/benefit case for universal smart metering¹³⁷. Broader estimates of the potential benefit of implicit DSF range up to 12 euros/kW/year (6 billion euros/year if replicated across the EU), which is consistent with the findings of some metering trials using stronger incentives.

233 Table A5 (in annex 8) summarises various attempts to quantify the benefits of explicit DSF in varying contexts. In the shorter term, its greatest value is likely to lie in delivering reliability. In some markets in the US, where relatively large quantities of demand-side resource are provided, they are largely purchased through capacity mechanisms. Studies focusing on this, summarised in Table 1.2, indicate possible net benefits in the range of 0.5 euros/kW/year to 2 euros/kW/year (which would imply 0.25 billion euros/year to 1 billion euros/year if achieved across the EU).

234 In the longer term, the EU is going through a major process to decarbonise its energy usage. This development poses two major challenges:

- Significant penetration of relatively inflexible low-carbon generation technologies will considerably reduce the efficiency of the demand-supply balancing task if delivered, as now, mainly by generation and storage.
- Electricity load growth may result from decarbonising applications such as transport and space heating, which currently mainly use fossil fuel. This is also likely to increase peak demand relative to off-peak, reducing the utilisation of generators and the network.

235 Developments in Germany show that, with a large stock of intermittent generation, price differences between demand peak and off-peak periods can become small, and volatility is driven more by variability of supply. Simple time-of-use (ToU) prices contribute little to managing this situation. But DSR can increase the ability of the system to integrate low-carbon generation, while reversing the trend of degradation in infrastructure utilisation. With a sharper peak, energy efficiency is also important to improve utilisation, which is under-rewarded by users' own energy cost savings, as already recognised by the participation of efficiency schemes in capacity markets in the US.

236 The future financial benefits of DSR are more uncertain. DSR competes with electricity storage, higher flexibility generation, and interconnection to provide flexibility services. The value of DSR depends upon the cost and usage of these other sources of flexibility. Developments in wind forecasting will also affect the value that demand-flexibility services can provide.

237 Because of these uncertainties, estimates of the financial benefits of DSR in the future vary widely. Lower amounts (6 euros/kW/year to 10 euros/kW/year by 2030, or 3 billion euros/year to 5 billion euros/year for the EU) have been found where substantial other sources of flexibility are assumed to be added to the system. Much higher values (up to 92 euros/kW/year by 2050 – GB study, which would imply 45 billion euro/year if replicated across the EU) have been exhibited where such other sources of flexibility are not increased.

137 Belgium, the Czech Republic, Germany, Latvia, Lithuania, Portugal, and Slovakia. Three states have not reported at date of EC COM(2014) 356.

Gas

- 238 The potential for implicit DSF at present is more limited in gas than in electricity. Smart gas meters are undergoing a relatively limited roll-out, providing additional implicit DSF opportunities in only some MSs, because only a minority of MSs found a financial case for them. Since gas is balanced on a daily timescale, customers need to shift demand at such timescales to provide useful balancing. In major applications such as space heating and water heating there is limited opportunity for shifting on a useful timescale.
- 239 There is long experience of using shipper-mediated interruptible contracts in gas. But increased access to liberalised gas markets and the potential for re-trading their contracted gas offer larger customers a more efficient route to market to obtain value from their flexibility than through shipper-mediated interruption.
- 240 There is a potential for explicit DSF mediated by the system operator (SO) to be useful in increasing system reliability in demand or supply emergencies, and reducing the cost of managing network congestion, albeit demand for this type of flexibility has been reduced in recent years by reductions in the demand for gas creating relatively high network reliability. The cost of using storage services¹³⁸ is relatively low compared to the estimated value of lost load of the great majority of potential DSF providers, beyond those who might already regularly take interruptible service to assist in managing seasonal variation. It is therefore likely that DSR's value is greater in managing rare supply events and network congestion, whereas storage is more economical for managing more frequent events.
- 241 The cost of multi-annual storage does not compare so favourably against the cost of buying wholesale gas in the market¹³⁹. The ability however, to buy additional gas when required to respond to supply emergencies is dependent on the ability to obtain additional delivery on a rapid timescale which in an emergency could be exacerbated by infrastructure constraints. One major purpose of storage and DSF is to manage the lack of ability to buy in gas, whether due to lack of landing capacity or inability to obtain rapid delivery.
- 242 As greater quantities of intermittent generation are integrated into the electricity system, occasional surpluses of cheap electricity occur which may need to be curtailed. The use of hybrid devices which can substitute electricity for gas can use this cheap surplus electricity and avoid burning gas. The greater need for flexible generation to balance intermittent sources may also increase the gas demand peak, and increase the value of DSR to facilitate those peak demands. The study did not present a summary table of estimated savings from the use of DSF in gas, as insufficient estimates have been made for such a summary.

138 See: DG TREN Study on natural gas storage in the EU, October 2008.

139 Quarterly Report on European Gas Markets, Q2 2013, EC DG-Energy.

2.5 Conclusions and recommendations

- 243 Since 2008, household and industrial consumer prices for electricity have primarily increased due to their non-contestable part (i.e. network charges, taxes and levies and VAT) as a consequence of non-harmonised regulatory frameworks across Europe. This trend in price increase was the most pronounced in Portugal, Latvia, Estonia, Lithuania, Greece, Spain and Cyprus.
- 244 The monitoring results show that the moderately concentrated electricity retail markets of Finland, Italy, Norway, Denmark, Great Britain, Germany and the Netherlands perform relatively well on the basis of a selection of the key competition performance indicators. The same is true for the Dutch, British, Spanish, German, Slovenian and the Czech gas retail markets, although gas retail markets are often more concentrated than in electricity. Retail competition performance indicators show no or weak signs of competition in MSs, with highly concentrated markets at national level in electricity for Bulgaria, Malta, Cyprus, Romania, Latvia, Lithuania and Hungary, and in gas for Bulgaria, Poland, Latvia, Hungary, Croatia and Luxembourg.
- 245 The results show further that in several countries which have relatively low market concentration, and perform relatively well based on other indicators presented in this report (e.g. choice of suppliers and offers, switching rates, entry/exit activity, and consumer's experiences), the link between retail and wholesale electricity prices is still weak. Electricity mark-ups in Austria, Germany, Great Britain and the Netherlands have increased constantly over the observed period. In this respect, changes in retail prices have often not been responsive to changes in the wholesale electricity price. Therefore, the market outcomes in these countries are as one would expect in a competitive market.
- 246 The majority of electricity and gas household consumers are not participating actively in the market by exercising choice among available suppliers or price and product offerings. As result, the proportion of electricity and gas household consumers with an alternative supplier (i.e. non-incumbent) is still very low in all but a few MSs: Great Britain (both markets), Norway in electricity and Germany, Spain and Ireland in gas markets.
- 247 The key perceived barriers to entering retail energy markets at the EU level overall seem to be the lack of harmonisation of MSs regulatory frameworks, the persistence of retail price regulation, high uncertainty concerning future regulatory developments and the low liquidity of wholesale markets, particularly in less-developed markets. The interviewees in the consultant study also identified low margins and tough competition as issues in specific more developed markets.
- 248 Although regulated end user-prices for households still exist in 12 out of 29 countries in electricity and 15 out of 26 countries in gas, the trend of removing them continued during 2013. In addition to the removal of end-user price regulation in an additional three MSs for electricity and one MS for gas households in 2013, plans for their removal are firmly in place in several MSs.
- 249 As already pointed out in last year's MMR, in order to promote market entry further, which will have an effect on competition and price levels in the market, MSs should follow good practices by: (i) allowing free opting in and out of regulated prices; (ii) setting regulated prices at least equal to or above cost; and (iii) updating regulated price to reflect the sourcing cost as much and as frequently as possible. In this way, they can facilitate the development of retail competition, which will in turn create the conditions for the removal of regulated prices.

3 Wholesale electricity markets and network access

3.1 Introduction

- 250 The creation of the IEM requires the full integration of Europe's energy networks and systems with a view to promoting efficient and secure energy supply, and facilitating the transition to a low-carbon economy.
- 251 Interconnectors connecting wholesale electricity markets play a vital role in ensuring that the internal European energy market is able to operate flexibly and efficiently. However, the assessment of the level of market integration and of the level of efficiency in the use of interconnectors contained in this report shows that, despite some progress in the recent years, important barriers to market integration still remain (Section 3.3) for two key reasons. The first reason is the inefficient use of existing transmission networks stemming from inefficiencies in cross-zonal capacity calculation, in cross-zonal capacity allocation, and, possibly, in the definition of bidding zones. The second is the lack of adequate investment in electricity network infrastructure to support the development of cross-zonal trade between areas characterised by different demand-supply balances.
- 252 In order to improve the efficiency of existing capacity utilisation, it is vital to implement a common, EU-wide cross-zonal approach to capacity allocation. This has been and still remains the focus of the Agency's work over the last three years, with the development of binding rules at EU level through the framework guidelines/network code process¹⁴⁰ and their early implementation through the Electricity Regional Initiatives process¹⁴¹. This is still one of the top priorities of the Agency. The aim of this work is to implement the Electricity Target Model (ETM), i.e. a shared vision to improve the level of market integration between MSs and to facilitate cross-border trade in all timeframes.
- 253 The ETM is intended to remove the remaining cross-border barriers to market integration, as it envisages: (i) single day-ahead market coupling with implicit auctions of cross-border capacity, which should replace explicit auctions; (ii) a single intraday market coupling with continuous implicit allocation of cross-border capacity; (iii) a single European platform for allocating long-term transmission rights; (iv) a flow-based capacity allocation method in highly meshed networks; and (v) for balancing, a TSO-TSO model with Common Merit Order (CMO) list for cross-border exchanges of balancing energy. As regards short-term markets, efficient, liquid and integrated balancing and intraday markets will facilitate the integration in the system of energy produced from RES by progressively exposing them to the same commitment and balancing responsibilities as conventional generators.
- 254 Efficient cross-zonal capacity calculation and the appropriate definition of bidding zones are other important elements of an efficient electricity market. The Capacity Allocation and Congestion Management (CACM) framework guidelines and the respective network codes provide for clear objectives in this area: (i) full coordination and optimisation of capacity calculation within regions; (ii) the use of flow-based capacity calculation methods¹⁴² in highly meshed networks; and (iii) regular monitoring of the efficiency of bidding zones. These processes are intended to optimise the utilisation of the existing infrastructure and to provide the market with more possibilities to exchange energy, enabling the cheapest supply to meet demand with the greatest willingness to pay in Europe, subject to the capability of the existing network.

140 In particular, in the areas of Capacity Allocation and Congestion Management for Electricity (CACM) and Electricity Balancing.

141 ACER (2013), Regional initiatives status review report 2013: Final Steps Towards the 2014 Deadline. See: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Regional%20Initiatives%20Status%20Review%20Report%202013.pdf.

142 In the flow-based capacity calculation method, exchanges between bidding zones are limited by the maximum flows on the critical network elements and power transfer distribution factors.

255 In view of the above and in line with the previous editions of the MMR, this chapter assesses: in Section 3.2 the level of market integration and the benefits stemming from the use of cross-border capacity; in Section 3.3 the barriers to market integration. Section 3.4 concludes this chapter with recommendations.

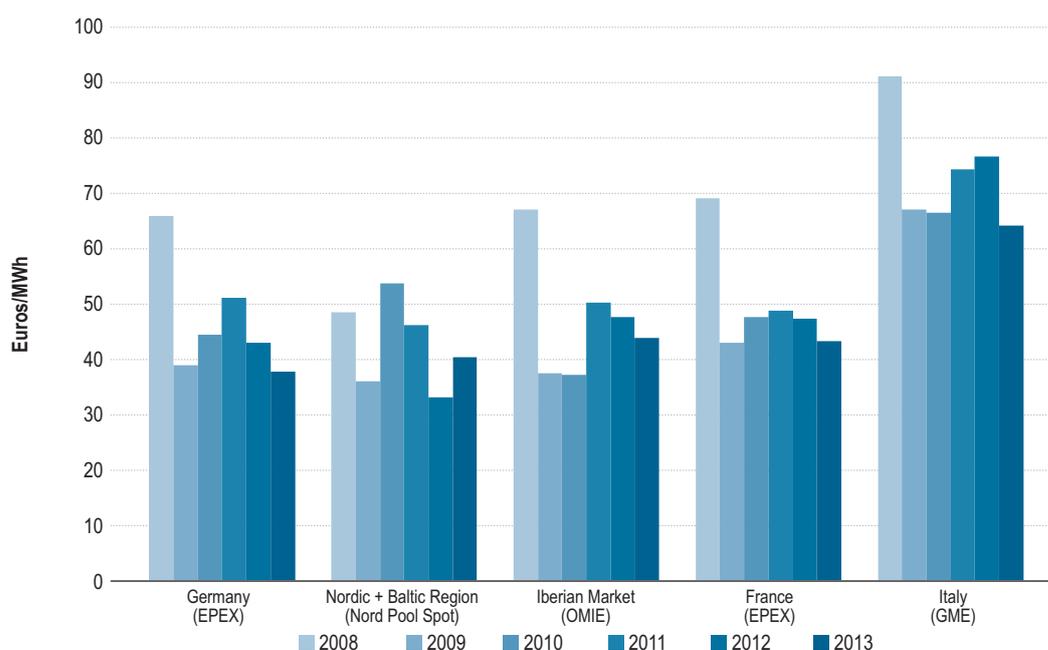
3.2 Markets' integration

256 This section reports on key developments in EU electricity wholesale markets, including an assessment of the level of wholesale market integration and its benefits.

3.2.1 Level of integration: price convergence

257 Figure 35 presents recent trends in wholesale electricity prices in the EU. Between 2008 and 2009 prices on nearly all EU day-ahead wholesale markets dropped by one third. The 2009 drop was due to the economic downturn that began in 2008 and impacted energy demand and fuel prices in 2009. With some exceptions, prices increased very slightly in 2010, but from 2011 onwards further decreases have been observed. This can be explained by the increasing penetration of renewables, combined with the availability of cheap coal on international markets. Aggregated production from solar and wind plants increased by more than 45% since 2011. This increase was essentially driven by the existence of national support schemes for renewables (see Annex 9 for an overview of these support schemes). Prices on the Nordic market show a different pattern, due to the fact that this market has a large share of hydro-based generation.

Figure 35: Evolution of European wholesale electricity prices at different European power exchanges – 2008–2013 (euros/MWh)

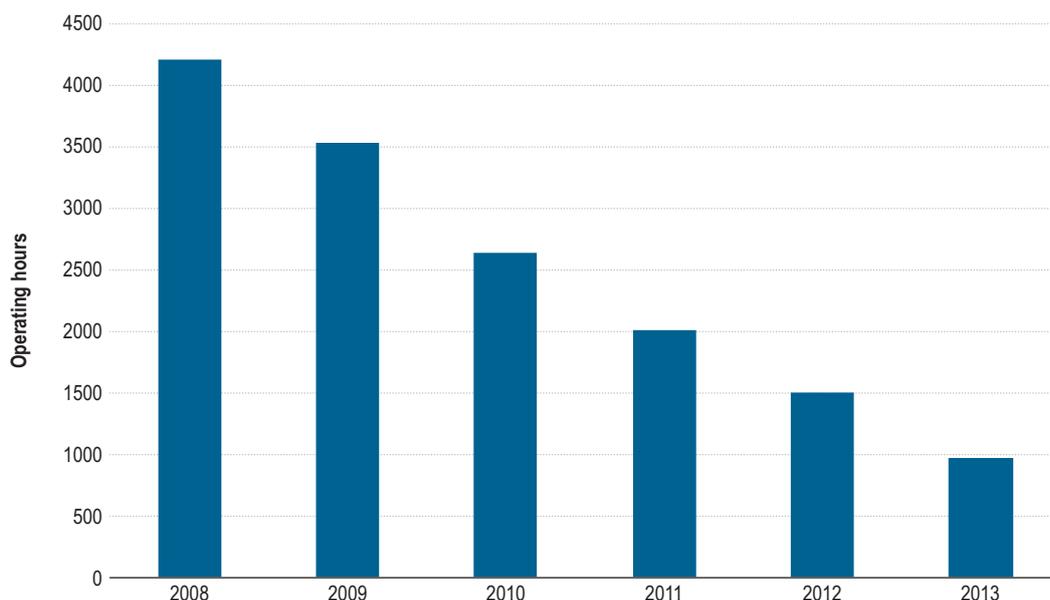


Source: Platts, PXs and data provided by NRAs through the Electricity Regional Initiatives (ERI¹⁴³) (2014) and ACER calculations

143 A total of 23 EU MSs and Switzerland replied to the ERI 2014 questionnaire, Germany made available data only for 2012; Ireland and Lithuania did not provide data.

258 The lower levels of electricity wholesale prices in Europe since 2009 have impacted gas-fired power plants in particular. Their marginal cost has exceeded day-ahead prices during an increasing number of hours in the course of the last few years, crowding them out in the electricity dispatch merit order. As a result, the level of utilisation of gas-fired power plants has decreased. Figure 36 exhibits this for Spain, where the average number of operating hours of gas-fired power plants has steadily decreased since 2008.

Figure 36: Evolution of the level of utilisation of gas-fired power plants in Spain – 2008–2013 (number of operating hours)



Source: CNMC (2014)

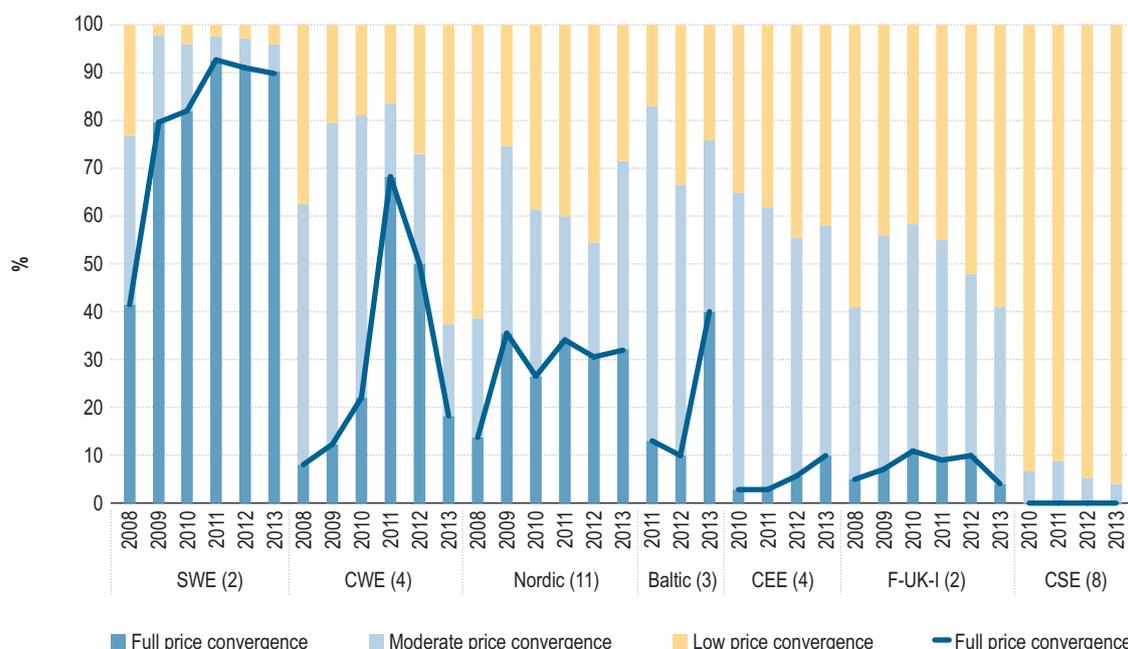
Day-ahead price convergence within regions

259 The convergence of wholesale electricity prices can be regarded as an indicator of market integration, even though the optimal level of market integration does not necessarily require full price convergence. The remainder of this section focuses on day-ahead markets price convergence within and across different regions. The section also assesses future market prices in the Central-West Europe (CWE) region for the same period. For the purpose of the analysis, countries were grouped into regions, and price convergence was assessed both within each region and across the regions. Regions are defined in accordance with Annex I of Regulation (EC) No 714/2009 (OJ L 211, 14/8/2009), with some slight modifications¹⁴⁴ to facilitate the analysis of price convergence.

144 The definition applied in this section is therefore as follows: the Baltic region (Estonia, Latvia and Lithuania), the CEE region (the Czech Republic, Hungary, Poland and Slovakia), the CSE region (Greece, Italy, Slovenia and Switzerland), the CWE region (Austria, Belgium, France, Germany, and the Netherlands), the FUI region (United Kingdom and the Republic of Ireland), Nordic (Denmark, Finland, Norway and Sweden) and the SWE region (Portugal and Spain).

260 Figure 37 provides an overview of the development of hourly price convergence¹⁴⁵ within EU regions over the last years.

Figure 37: Price convergence in Europe by region (ranked) – 2008–2013 (% of hours)



Source: Platts, PXs and data provided by NRAs through the ERI (2014) and ACER calculations

Note: The numbers in brackets refers to the number of bidding zones per region included in the calculations.

261 The most significant decline in full price convergence in 2013 was observed in the CWE region. Following an 18% drop in 2012 compared to 2011, an additional decrease of 32% took place in 2013, resulting in a price convergence level of 18% for the region. This is slightly below the level registered in the CWE region in 2010 (22%) i.e. the year of the expansion of the CWE market coupling to Germany (November 2010). Moreover, the number of hours with a price differential exceeding 10 euros/MWh (low price convergence) has nearly quadrupled in the CWE region over the last two years, from 16% in 2011 to almost 64% in 2013. The most significant increase in full price convergence took place within the Baltic region, which registered equal prices during 40% in 2013 compared to 10% in 2012.

CWE Region

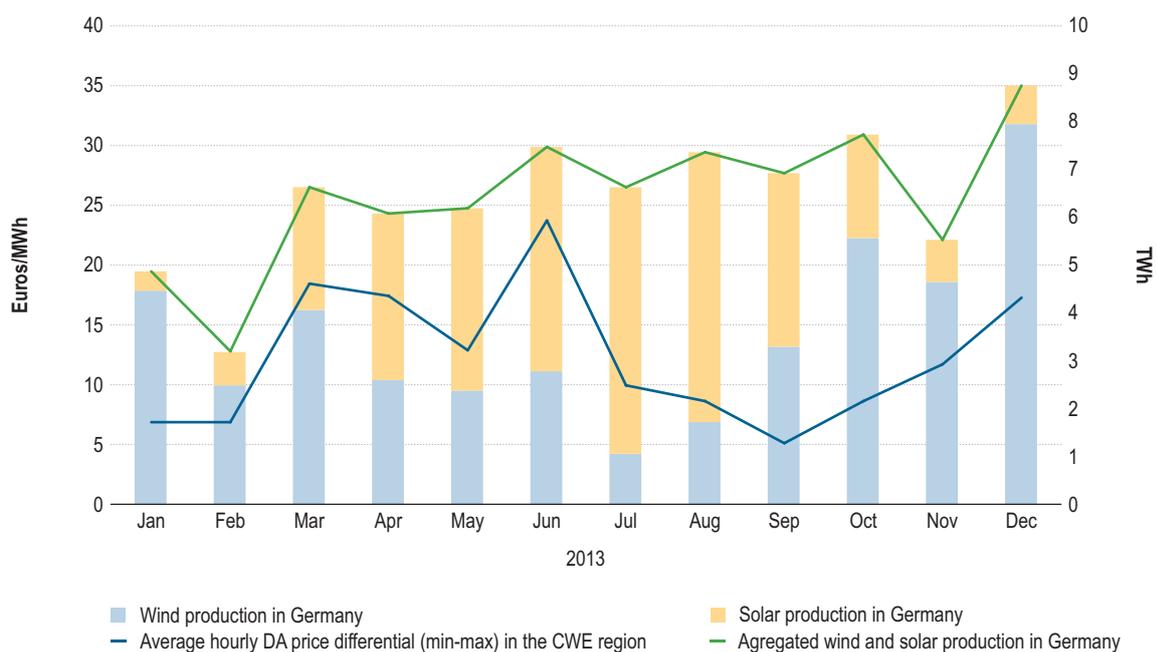
262 Since 2011, day-ahead price convergence has been decreasing in the CWE region. This decrease has become more evident since the third quarter of 2012. Price divergence has been particularly high between Germany and the Netherlands, where full price convergence was registered during only 19% of the hours in 2013, compared to 52% in 2012 and 68% in 2011. The overall sharp price divergence in the CWE region can be explained by a combination of factors.

263 First, the increasing share of wind and solar power in Germany drove German wholesale prices in 2013 down more than elsewhere in the region, causing high price spreads in the CWE region,

145 Price differentials are calculated as the hourly difference between the maximum and minimum price of the assessed bidding zone prices. The results are presented as a percentage of all hours in three categories: the number of hours with a price differential: (i) of less than 1 euros/MWh (i.e. 'full price convergence'); (ii) from 1 to 10 euros/MWh (i.e. 'moderate price convergence'); and (iii) of more than 10 euros/MWh (i.e. 'low price convergence'). Note that the results are affected by the number of bidding zones in a given region (i.e. price convergence is easier to achieve in regions with fewer bidding zones).

in particular between the German and the Dutch markets. As a consequence, German electricity exports reached a record¹⁴⁶ in 2013¹⁴⁷. Figure 38 shows an important correlation between the price spreads in the CWE region and aggregated solar and wind generation in Germany in 2013. While in 2012 price divergence in the CWE region was overall correlated with production from wind¹⁴⁸, Figure 38 highlights the contribution of solar generation to price divergence in 2013, particularly during the summer.

Figure 38: Monthly aggregated wind and solar production in Germany compared to price differentials in the CWE region – 2013 (TWh and euros/MWh)



Source: Platts, ENTSO-E (2014) and ACER calculations

Note: The price differentials are calculated as the hourly difference between the maximum and minimum price of the bidding zones of the CWE region. In 2013, the lowest price was recorded in Germany for around 87% of the times.

264 Second, cheap coal on international markets and the large coal-fired power plants in Germany (around 45%¹⁴⁹ of total electricity production in 2013 was coal-based) contributed further to low German day-ahead prices. Moreover, in the Netherlands, where gas-fired power plants account for around 70% of installed capacity¹⁵⁰, power prices have been rising over the last two years due to increasing gas prices. The impact of fuel prices in Germany and the Netherlands are shown in Figure 39, with increasing gas-coal price spreads and increasing day-ahead price spreads between 2011 and 2013.

265 Finally, French and Belgian price premiums to Germany can be partially explained by a reduced availability of nuclear power plants in France and in Belgium, where from June 2012 to June 2013, two nuclear plants were taken off the grid for inspection¹⁵¹.

146 ENTSO-E (2014).

147 Cross-border export capacities from Germany to neighbouring MSs in the CWE region did not increase in 2013. Therefore, the soaring German exports can be explained only by a higher utilisation of the interconnectors from Germany to its neighbouring countries.

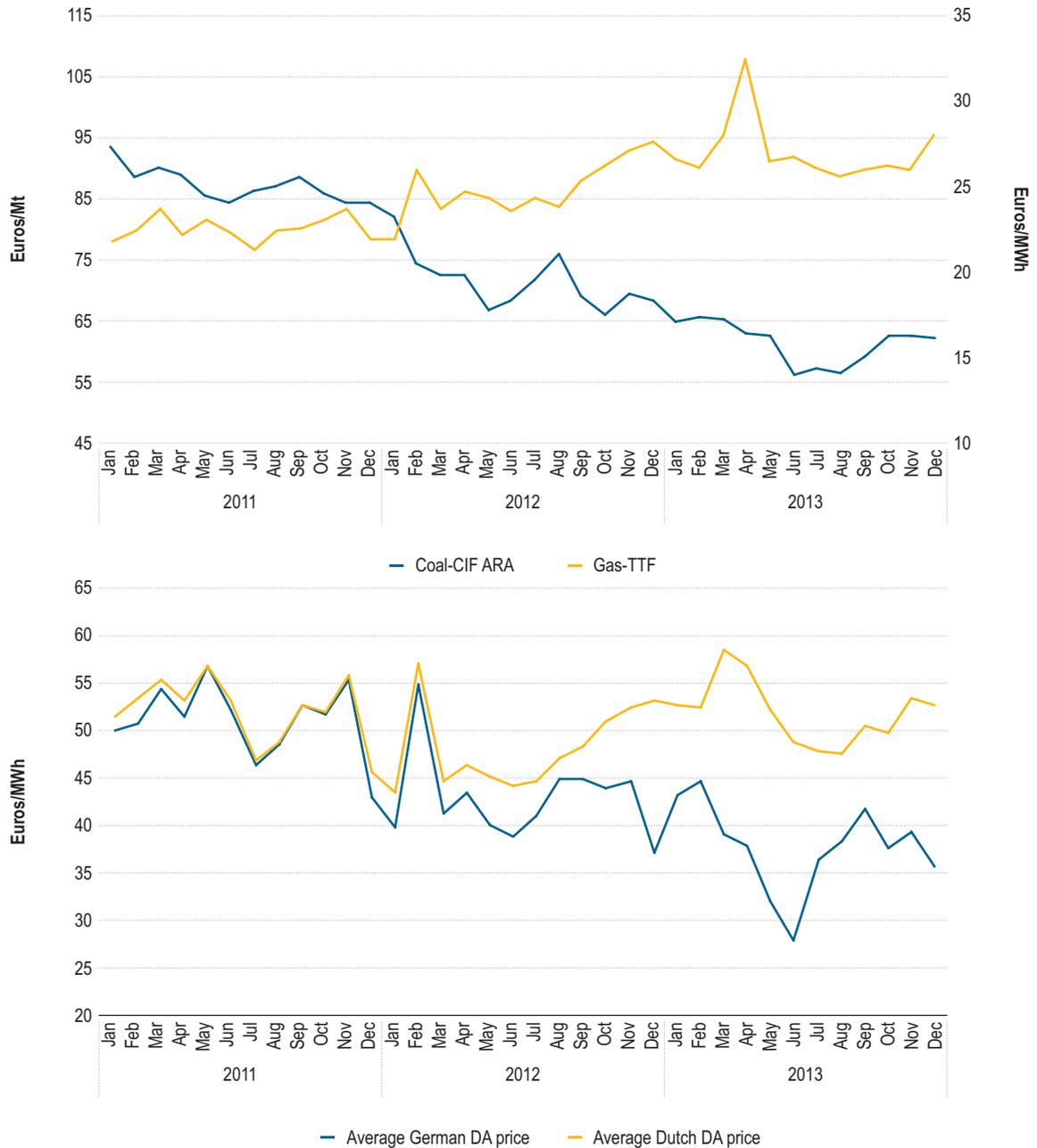
148 See: MMR 2012, page 63, figure 14.

149 Source: BNetzA (2014).

150 According to TenneT, see: <http://energieinfo.tennet.org/Production/InstalledCapacity.aspx>.

151 See: http://ec.europa.eu/euratom/observatory_news.html.

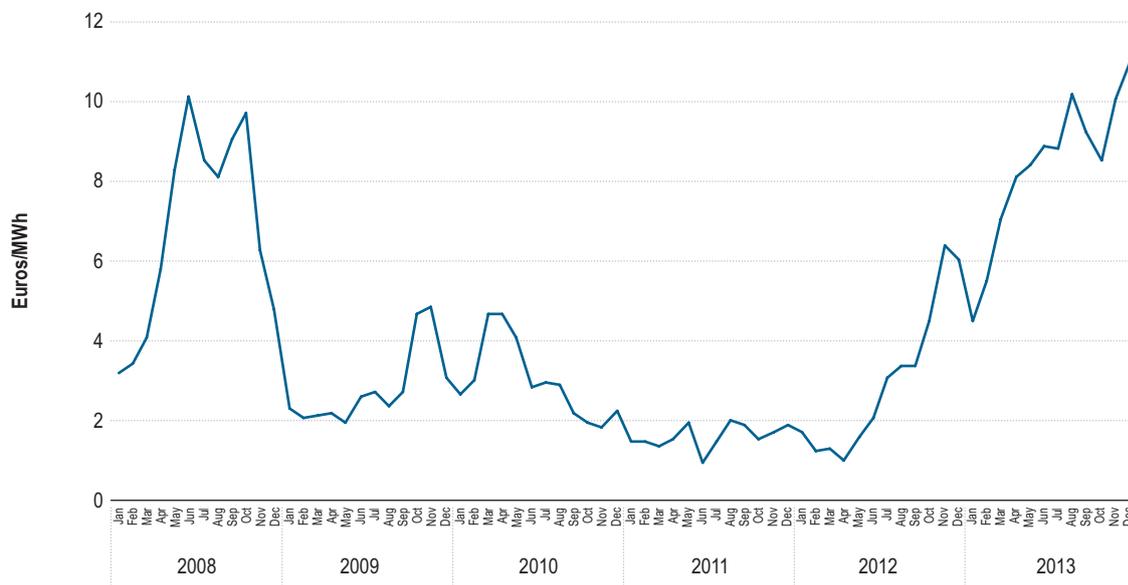
Figure 39: Evolution of fuel (Coal-CIF ARA & Gas-TTF) and power prices (German and Dutch average day-ahead prices) – 2011–2013 (euros/Mt and euros/MWh)



Source: Platts (2014)

266 Figure 40 shows that in the period from 2008 to 2013, convergence of future market prices in the CWE region followed the trend shown for day-ahead price convergence. Moreover, it shows that in 2013, the market anticipated price differentials across the CWE to further increase during 2014.

Figure 40: Price differentials of base load year-ahead products in the CWE region – 2008–2013 (euros/MWh)



Source: Platts (2014)

Note: The figure shows the prices of base load power for delivery one calendar year ahead in the CWE region. The price differentials are calculated as the difference between the maximum and minimum year-ahead prices (closing daily values) of the bidding zones of the CWE region.

Baltic Region

- 267 The level of full price convergence in the Baltic region increased to 40% of all hours in 2013 from merely 10% the year before¹⁵², due to the launch of the new bidding area at Nord Pool Spot covering Latvia in June 2013. Although full price convergence occurred for 80% of the hours in June, it dropped to less than 25% between July and October.
- 268 This sharp decrease can be explained by maintenance work on generation and cross-border transmission capacities. During the summer, several generation maintenance works took place in the Baltics and Finland, which obliged the less competitive power plants, particularly in Latvia and Lithuania, to operate. This contributed to the observed price differentials between these two MSs and Estonia. Reduced cross-border capacities were observed in the Region due to network outages caused by maintenance works which were moved from summer to autumn.
- 269 Figure 41 shows a high correlation between the available export capacity from Estonia to Latvia and the level of price convergence in the Baltic region in 2013 after the bidding area of Latvia was created.
- 270 In addition, the decrease in price convergence during the summer can be partly explained by limited imports from Russia and Belarus to Lithuania (the main importer from these two countries in the

152 Before 2013, price convergence was calculated only for Estonia and Lithuania, which are not directly connected. Therefore, high price convergence could not have been expected until the new bidding area of Latvia (which is connected with both Estonia and Lithuania) was created.

Baltic region) during that period, contributing to high prices in Lithuania. This was due to reductions in the cross-border capacity available from Russia and Belarus to Lithuania. The interconnector with Russia (via Kaliningrad) was affected by maintenance works on the combined heat and power (CHP) plant located in Russia close to the Lithuanian border, while the interconnector with Belarus was affected by maintenance works which took longer than expected in 2013. In addition, the physical flows resulting from the imports from Russia to Lithuania cannot be channelled through the Estonian-Latvian border since 15 March 2013, when an agreement among the Baltic TSOs was signed. This agreement aimed, *inter alia*, to allocate to internal trading (within the Baltic States) the entire available transmission capacity between Estonia and Latvia, which, before the agreement, was also available for Russian exports and imports.

271 In this context, it is worth mentioning that the characteristics of the Baltic wholesale markets, with few participants, low liquidity, high concentration and limited cross-border capacities make day-ahead prices and hence price convergence sensitive to small changes in available generation and interconnector capacity.

Figure 41: Full price convergence in the Baltic region compared to cross-border capacity (monthly average NTC) from Estonia to Latvia – 2013 (% and MW)



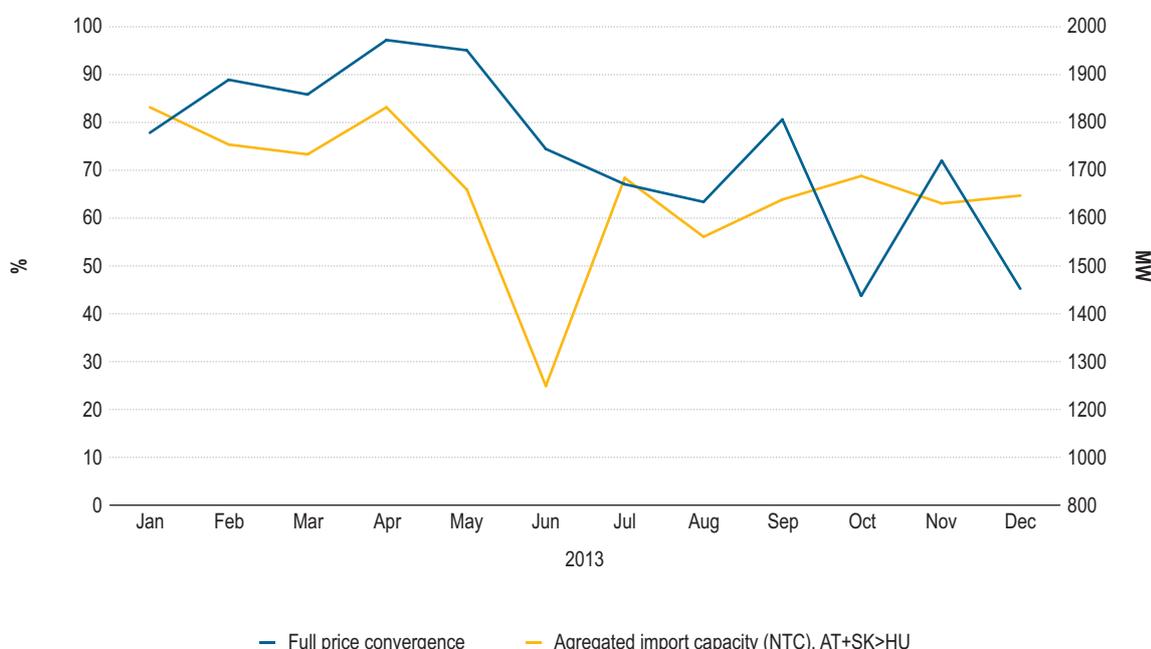
Source: Platts and ENTSO-E (2014)

CEE Region

272 Full price convergence in the CEE region increased modestly from 6% of all hours in 2012 to 10% in 2013. However, between the Czech Republic, Hungary and Slovakia, it doubled from 37% of all hours in 2012 to 74% in 2013. This is due to the extension of market coupling from the Czech Republic and Slovakia to Hungary in September 2012. In these markets, day-ahead prices converged more than 90% of the time in May 2013, but price convergence significantly decreased over the second half of the year (falling to just less than 50% in December). This was mainly due to restricted cross-border capacity from Slovakia and Austria to Hungary, causing Hungarian prices to increase.

273 Figure 42 shows a sharp drop in the number of hours with full price convergence due to the decrease in import capacity (NTC) from Slovakia and Austria to Hungary since May 2013. According to the Hungarian NRA, the cross-border capacity between Austria and Hungary was frequently reduced due to reinforcement works in the North-East Austrian network, which impacted the capacity offered on that border in 2013. Furthermore, the maintenance of different Hungarian and Slovak grid elements had a considerable influence on NTC values between these two MSs. Finally, the low price convergence observed in October 2013 was caused not only by reduced import capacities, but also by outages at several nuclear plants in Hungary (including the Paks nuclear power plant) and neighbouring countries¹⁵³.

Figure 42: Full price convergence among the Czech Republic, Hungary and Slovakia compared to aggregated import capacity (monthly average NTC) from Austria and Slovakia to Hungary – 2013 (% and MW)



Source: Platts and ENTSO-E (2014)

Nordic, FUKI, SWE and CSE regions

274 In the F-UK-I region, full price convergence was achieved during 4% of all hours in 2013, which is a slight decrease in comparison to 2012. Whilst the average aggregated NTC value for the Moyle and East West interconnectors between Great Britain and Ireland increased by 9% (538 MW in 2012 to 584 MW in 2013), price convergence was not enhanced. This is probably due to completely different wholesale market arrangements in the respective countries and the lack of market coupling implementation.

275 In 2013, the price convergence in the SWE (91% of hours with full price convergence) and Nordic regions (32%) remained essentially unchanged compared to 2012 (with 92% and 31%, respectively). In the Central-South (CSE) region, overall full price convergence remained low.

153 See: http://www.pxe.cz/pxe_downloads/Statistics/Market_comment/mc1310.pdf.

Inter-regional price convergence

- 276 In 2013 inter-regional price convergence remained at lower levels than within the regions. Nevertheless, some noticeable increases occurred, namely between Germany and Denmark West, Germany and Sweden, and Poland and Sweden, where full price convergence was recorded during, respectively 50%, 32 % and 19% of all the hours in 2013, compared to 43%, 27% and 8% in 2012.
- 277 The development of the available capacity (NTC) between Germany and the two above-mentioned Nordic MSs deserves closer attention. In both cases, cross-border capacity decreased in 2013 compared to 2012, although the increasing penetration of renewables in Germany and available cheap coal¹⁵⁴ reduced German day-ahead prices closer to Danish and Swedish ones. Average cross-border capacity from Germany to Sweden declined by 18% from 375 MW in 2012 to 308 MW in 2013¹⁵⁵, which continued the downward trend observed the year before (average NTC of 407 MW in 2011). This was particularly relevant during off-peak hours, since in 2013, German prices during those hours were on average lower than Swedish ones for the first time in the last three years.
- 278 A higher amount of export capacity made available from Germany to Sweden should have allowed prices to converge further. According to the Swedish NRA, the reduction in the available capacity is likely to have been caused by a combination of factors on both sides of the border. On the German side, it might have been due to the increasing renewable generation in the northern part of the German grid, forcing the relevant German TSO (TenneT) to limit exports to Sweden at times of high RES injection, creating bottlenecks within the single bidding zone of Germany and Austria. On the Swedish side, it is explained by the limited capacity of the so-called 'West Coast Corridor' in Sweden, which restricts the amount of power that can flow from the continent into Norway during off-peak hours. This capacity is about to increase with further investments in the transmission network, for instance in Skagerrak 4, the fourth interconnector between Norway and Denmark.
- 279 Similarly, average cross-border capacity from West Denmark to Germany decreased by 18% from 811 MW in 2012 to 669 MW in 2013¹⁵⁶. During peak hours in 2013, when Danish prices (West Denmark) were lower than German ones, exports to Germany were limited and, as a consequence, the level of price convergence was lower than it could have been. The Agency sent a letter on 11 March 2014 to the Danish and German NRAs raising questions about the decreases in cross-border transmission capacity available on this border. On 11 April 2014, the two NRAs sent a joint reply where information from the two relevant TSOs (Energinet.dk and TenneT GmbH) was provided. According to the two TSOs "several coinciding constraints are the reasons for less available capacity" which includes "the high pace of increase in wind generation, increased volatility". In addition "necessary network maintenance in Northern Germany in combination with lengthy procedures for network development" was mentioned. However, these reasons may not fully explain the decrease in the NTC value in 2013, as these factors were already present in preceding years. The Agency was informed by the NRAs that the TSOs conducted a study to investigate the possibility of increasing the daily NTC by taking remedial actions.
- 280 A low level of price convergence is still observed in 2013 between Great Britain and CWE, e.g. between Great Britain and France or Great Britain and the Netherlands, with equal prices in 2013 in less than 5% and 10% of the hours, respectively.

154 According to the evolution of the European-delivered CIF ARA coal price (Platts).

155 In the opposite direction, it slightly increased by 5%.

156 In the opposite direction, it remained unchanged.

281 The market coupling of Great Britain with the CWE, Nordic and the Baltic regions, through the North Western Europe (NWE) Price Coupling¹⁵⁷ initiative launched on 4 February 2014, is expected to improve price convergence across all these regions in the coming years. Furthermore, since 13 May 2014, capacity at the French-Spanish border is implicitly allocated through the same price coupling project, which is expected to contribute to further price convergence on this border.

3.2.2 Benefits of market integration

282 This section reports on the benefits of market integration. It updates on progress in market coupling and on the 'gross welfare benefits' that the integration of the electricity European wholesale markets renders.

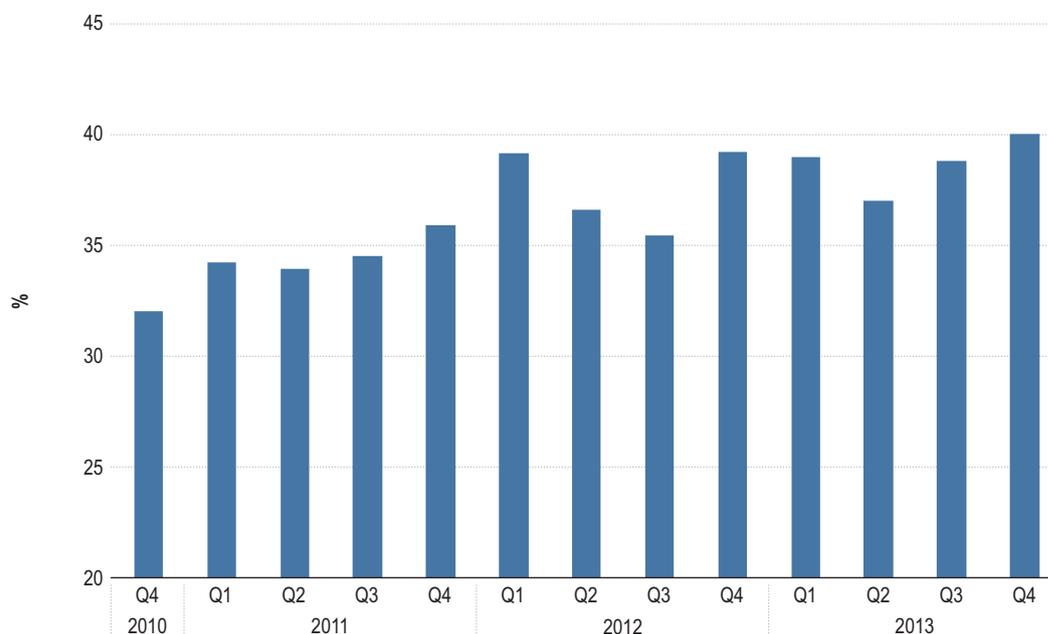
3.2.2.1 Progress in market coupling

283 This section provides an update on the use of existing cross-border transmission capacity throughout Europe at the day-ahead timeframe. First, it presents the level of commercial use of interconnections. Second, it assesses the economic efficiency of market coupling (implicit capacity allocation) compared to the explicit allocation of cross-border capacity. The use of the remaining capacity after day-ahead (i.e. cross-border intraday trade and exchange of balancing services) is analysed in section 3.3.1. Figure 43 shows the evolution of the (commercial) use¹⁵⁸ of overall EU electricity cross-border capacity at the day-ahead timeframe over the last thirteen quarters. According to this figure, the use of cross-border capacities has gradually increased in the course of the last three years, reaching 40% in 2013. The increased use of the interconnectors could be due to a combination of reasons (including higher price dispersion, e.g. as observed in the CWE region in 2013) and does not necessarily entail a more efficient use of capacity.

157 The NWE Price Coupling is a project initiated by the TSOs and PXs of the countries in the NWE region which allows for the market coupling of all the bidding areas within the CWE, Nordic and Baltic regions and Great Britain by using a single algorithm, the Price Coupling of Regions (PCR) solution.

158 The percentages of use of the interconnections are calculated for every border and direction as follows: all the hourly net nominations are added and divided by the total amount of capacity offered to the market (NTC D-1 values). The results are shown in aggregated form for all borders.

Figure 43: Evolution of the quarterly level of commercial use of interconnections (day-ahead) as a percentage of NTC values for all EU borders¹⁵⁹ – October 2010–2013 (%)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

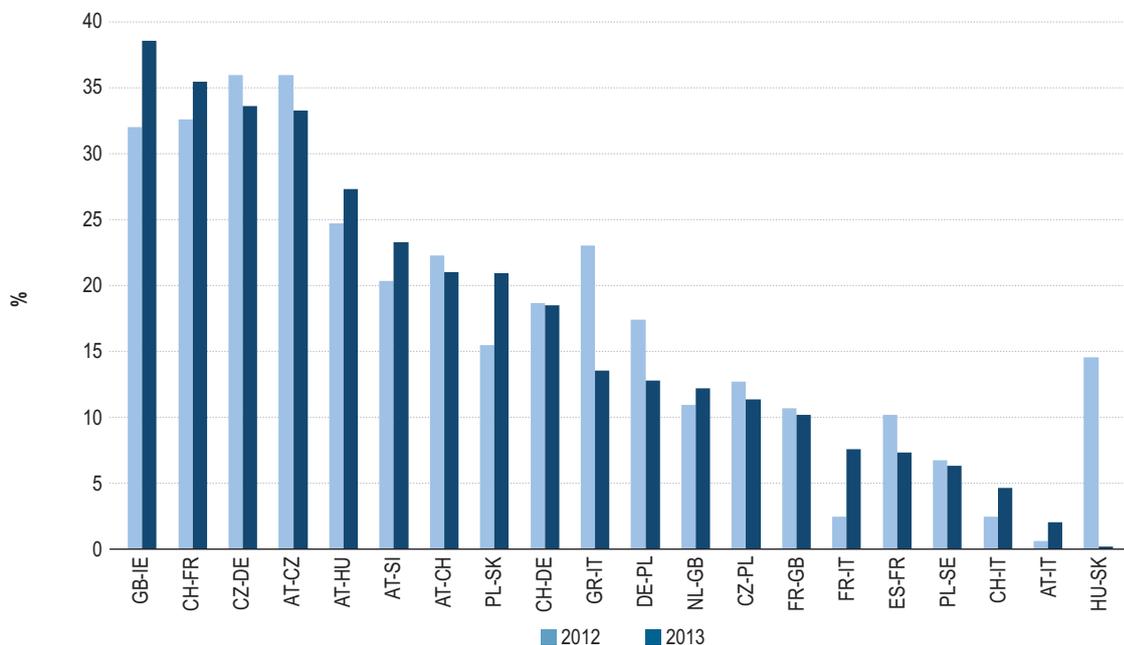
284 The ETM for the day-ahead market envisages a single European price coupling applied throughout Europe which eliminates the remaining ‘wrong-way flows’¹⁶⁰ and hence improves the use of cross-border capacities for trade. Figure 44 shows the evolution of ‘wrong-way flows’ between 2012 and 2013 on EU borders where market coupling has not yet been implemented. It shows that ‘wrong-way flows’ are still present on around one third of all EU borders, and that, in 2013, ‘wrong-way flows’ disappeared only on the Hungarian-Slovakian border due to the implementation of market coupling in September 2012¹⁶¹.

159 Over 40 EU borders were included in this analysis.

160 A ‘wrong-way flow’ hour is considered as such when the final net nomination on a given border takes place from the higher to the lower price zone, with a price difference of at least one euros/MWh.

161 In 2013, market coupling was not extended to any existing bidding area in Europe. However, on 3 June 2013, a new bidding area covering Latvia was launched within Nord Pool Spot, allowing for the transmission capacity between Estonia and Latvia and between Lithuania and Latvia to be implicitly auctioned.

Figure 44: Percentage of hours with net day-ahead nominations against price differentials per border – 2012–2013 (%)

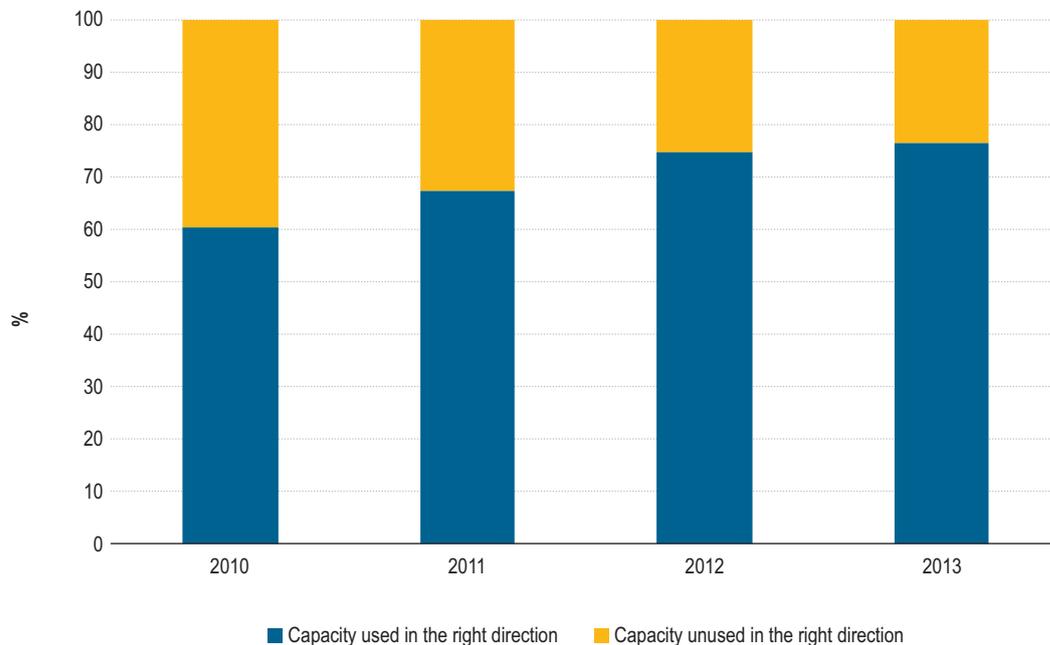


Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note: Only borders with ‘wrong-way flows’ present in more than 2% of the hours of 2012 and 2013 are shown. Wrong-way flows are not present on borders which are already coupled (not shown in the figure), with the exception of the borders between Great Britain and the Netherlands and between Poland and Sweden. These two borders present ‘wrong-way flows’ when they are calculated on the basis of the most liquid day-ahead price references in the British and the Polish markets. These prices are different from those formed as a result of the respective auctions.

285 The absence of ‘wrong-way flows,’ although necessary, is not sufficient to guarantee the efficient use of interconnections in the day-ahead market. When prices diverge across a border, the full utilisation of the cross-border capacity in the ‘right direction’ is also essential for achieving efficient use of an interconnection. Indeed, the utilisation level of an interconnector in the ‘right direction’, in the presence of price differentials, is a suitable indicator of the efficient use of cross-border capacities. Figure 45 shows that, overall, the efficient use of European electricity interconnections has increased from less than 60% in 2010 to 77% in 2013, following the implementation of market coupling at several borders between 2010 and 2012. In 2013, however, market coupling was not extended to other EU borders. Therefore, efficiency of the interconnections remained virtually at the 2012 level, i.e. a less than 2% increase. The remaining 23% improvement will be achieved as soon as market coupling is implemented on all the borders with explicit auctions at the end of 2013 (some already coupled during the course of 2014, as explained at the end of this section).

Figure 45: Percentage of available capacity (NTC) used in the ‘right direction’ in the presence of a significant price differential, all EU electricity borders – 2010–2013 (%)



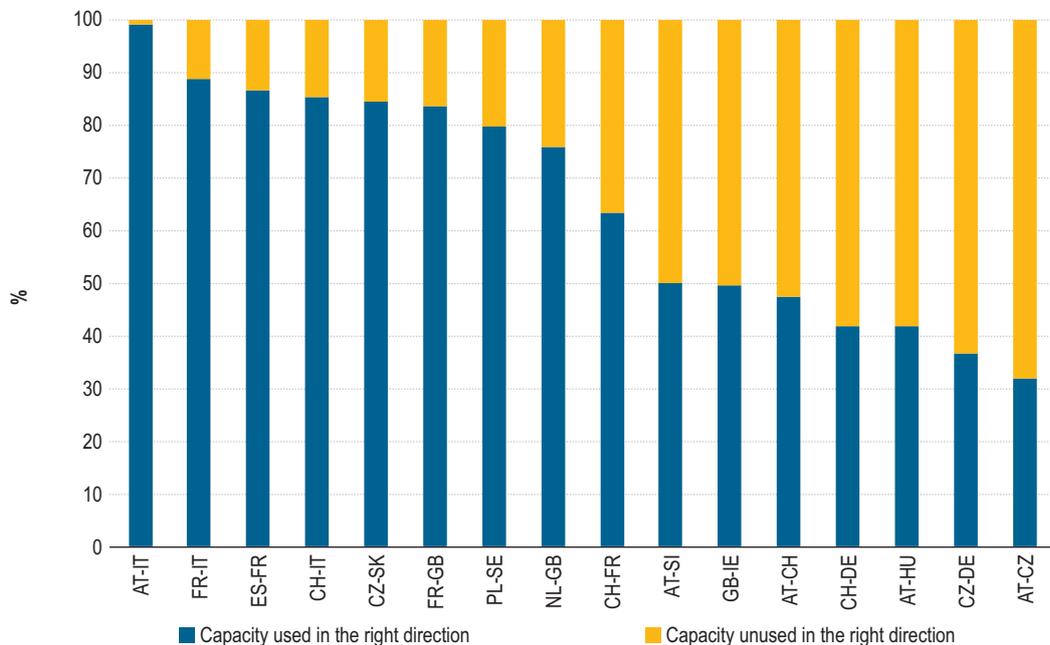
Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note: 2010 only includes the fourth quarter.

286 Figure 46 shows levels of efficient use of interconnection capacity for those borders with explicit day-ahead auctions¹⁶². In 2013, borders within the Central-East Europe (CEE) region recorded the lowest levels of efficient cross-border capacity use.

162 The capacity on the borders between Great Britain and the Netherlands, and between Poland and Sweden is implicitly auctioned. Since the most liquid day-ahead price references in the British and the Polish markets are different from the prices formed as a result of the respective auctions, the two borders were also included in the analysis of the efficient use of the interconnectors. The N2EX and PolPX day-ahead prices are used for the respective zones of Great Britain and Poland.

Figure 46: Percentage of available capacity (NTC) used in the ‘right direction’ in the presence of a significant price differential, per border – 2013 (%)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note 1: On coupled borders (not shown in the figure) 100% of the available capacity is used in the right direction, with the exception of the borders between Great Britain and the Netherlands and between Poland and Sweden. See the Note under Figure 44.

Note 2: The borders within the CEE region with ‘multilateral’ technical profiles (PL-CZ+DE+SK and DE_50Hz-CZ+PL) are not included in this figure, since the methodology applied to the other borders, based on NTC values, is not applicable to these CEE borders for this or the following figures. Figure 44 shows that in 2013 on those borders (CZ-DE, DE-PL, PL-SK) capacity was underutilised, as they were affected by ‘wrong-way flows’.

287 Due to the implementation of market coupling on 25 out of 40 borders, the EU has made a significant efficiency gain (and hence improved social welfare) for the benefit of EU consumers. In order to know the overall benefits from market coupling, it would be desirable also to examine a period of trade before the implementation of market coupling for each border. This is not always possible due to the lack of comprehensive data on NTC values before September 2012. For non-coupled borders, the actual ‘loss in social welfare’ can be assumed to equal the benefits from market coupling once this is implemented. An order of magnitude for the whole of the EU can be obtained by using the estimate from non-market coupled borders and relate that, proportionally, to the market coupled borders.

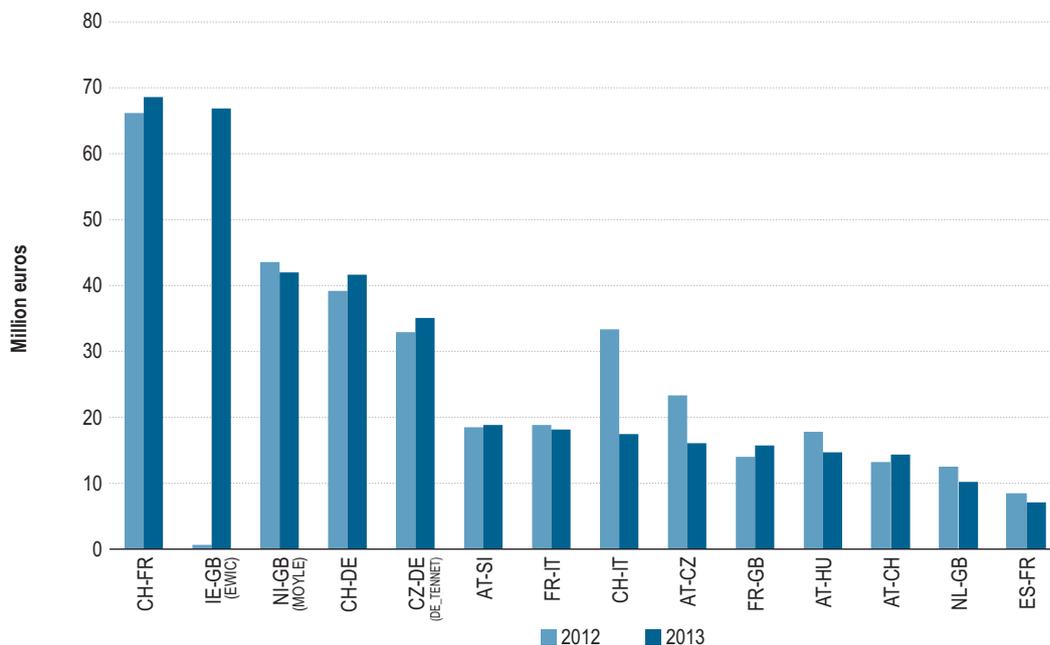
- 288 Figure 47 shows that 'social welfare losses'¹⁶³ in Europe due to the lack of market coupling amount to more than 400 million euros/year (average of 2012 and 2013). This would mean an annual 'social welfare gain' of around 12.5 million euros per GW of available cross-border capacity, or around 600 million euros per year for all the borders where market coupling has already been implemented. In sum, once market coupling is fully completed, a 'social welfare gain' of more than 1 billion euros/year is expected¹⁶⁴.
- 289 In Figure 47, the EU borders are ranked by the 'loss in social welfare' due to the absence of market coupling in 2012 and 2013. It shows that the French-Swiss border continues to have the highest loss in total surplus (almost 70 million euros)¹⁶⁵, closely followed by the border between Great Britain and Ireland, where the 'loss' significantly increased compared to 2012. On this border, new capacity was made available following the commissioning of the East-West interconnector late in 2012. Although the new interconnector offers more trading possibilities and will contribute to increasing social welfare in the British and Irish markets, the gains in social welfare are lower than they could be if the Irish and British wholesale markets were coupled. The lack of market coupling on this new interconnector, partly explains the increase in 'social welfare losses' observed on this border in 2013.

163 The 'loss in social welfare' associated with the absence of implicit auctions between two bidding zones has been approximated below, as the product of the positive price differential across the border between those two zones and the daily capacity that remains unused or is used in the opposite direction. This approximation should be considered with caution, as it probably overestimates the results due to the absence of implicit methods, although it provides an indication of the scale of the loss of social welfare on each border. For more details on the methodology used to calculate 'loss in social welfare', see: MMR 2012, page 81.

164 This extrapolation might underestimate the benefits, as it is based on estimates on borders which are not yet coupled. One would expect borders where the benefits are highest to be coupled first. The figure of 1 billion euros/year is a conservative value compared to the estimates delivered by Booz&Co for the European Commission, see: http://ec.europa.eu/energy/infrastructure/studies/doc/20130902_energy_integration_benefits.pdf.

122 165 For details on the reasons for the 'social welfare loss' on this border, see: MMR 2012, page 82.

Figure 47: Estimated ‘loss in social welfare’ due to the absence of market coupling, per border – 2012–2013 (million euros)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note 1: Only non-coupled borders are shown, with the exception of the borders between Great Britain and the Netherlands and between Poland and Sweden. See note under Figure 44.

Note 2: The borders within the CEE region with ‘multilateral’ technical profiles are not included in this figure; see note under. IE-GB (EWIC) refers to the East West Interconnector which links the electricity transmission grids of Ireland and Great Britain. NI-GB (MOYLE) refers to the Moyle Interconnector which links the electricity grids of Northern Ireland and Great Britain.

290 The values of losses due to inefficient day-ahead allocation methods shown above illustrate the urgent need to finalise the implementation of the ETM. Indeed, an important step towards the full implementation of market coupling throughout Europe was achieved on 4 February 2014, when the NWE price coupling went live. Also, since 13 May 2014, the capacity on the French-Spanish border is implicitly allocated through the PCR algorithm.

3.2.3 Gross welfare benefits of interconnectors

291 Market integration is expected to deliver several benefits; one of these is enhanced economic efficiency, allowing the lowest cost producer to serve demand in neighbouring areas. This section shows the additional benefit of an incremental increase in interconnector capacity on a bidding zone border, using the ‘gross welfare benefits’ indicator. The indicator is based on the same methodology introduced in the first edition of the MMR.

292 Gross welfare benefit includes, first, ‘consumers’ and ‘producers’ surplus gained by consumers and producers who participate in power exchanges (welfare is measured as the difference between the prices bid into the market and the obtained matched prices multiplied by the quantity) and second, congestion rents. The first component measures the monetary gain (saving) that could be obtained by consumers (producers) because they are able to purchase (sell) electricity at a price that is less than the higher (lower) price they would be willing to pay (offer) as a result of changes in cross-border transmission capacity. The second component corresponds to price differences between intercon-

nected markets multiplied by hourly aggregated nominations¹⁶⁶ between these markets. It is important to note that gross welfare benefits, as opposed to net welfare benefits, exclude all costs incurred by TSOs in making this cross-border capacity available to the market.

293 For the purpose of this section, several European Power Exchanges¹⁶⁷ were asked to perform a simulation in order to estimate these gross welfare benefits for the year 2013. The algorithm used for the simulations originates from the Price Coupling of Regions (PCR) Project, which is a joint effort between seven power exchanges, APX, BELPEX, EPEX SPOT, GME, NORD POOL SPOT, OMIE and OTE, aimed at implementing a single European day-ahead price coupling of power regions.

294 There are a few caveats underlying the results presented in this section. For example, the gross welfare benefits include merely the power traded in organised day-ahead exchanges, thus excluding, for instance, forward products such as week-ahead, year-ahead and all OTC trade. As a consequence, the estimated surpluses cannot be considered as the whole welfare benefit in a given country. Moreover, not all borders in Europe are included, which is partly due to the fact that not all markets have been market-coupled yet, or because not all Power Exchanges participated in the analysis. A strong assumption underlying these simulations is that bids submitted in each market remain the same, irrespective of the scenario in terms of available cross-border capacity (all things else being equal). Furthermore, the results refer to one year (2013), and can change from year to year due to factors such as the amount of wind-based generation, the dynamics of hydro power affected by precipitation levels and market fundamentals. Due to timing constraints, the most recent and optimal set-up of the algorithms was not used for these calculations. Finally, market price boundaries as well as (supply and demand bid) curve shapes have a strong influence on the calculated total welfare. This makes it very difficult to compare total welfare between different scenarios in which the cross-border capacity is modified while assuming unchanged order books.

295 The gross welfare benefits for 2013 were computed for two scenarios:

1. Historical scenario: the gross welfare benefit for 2013 calculated on the basis of detailed historical information such as network constraints, the exchange participants' order books (that is, supply and demand bids) and available cross-border capacity. For the latter, the ATC (available transfer capacity) was used as a proxy of capacity effectively made available for trade on 24 borders;
2. Incremental scenario: the same as in the Historical scenario, with the ATC values for each border inflated by 100 MW¹⁶⁸. As explained above, the assumption is that all other elements (market bids, network constraints, market rules, etc.) remain the same.

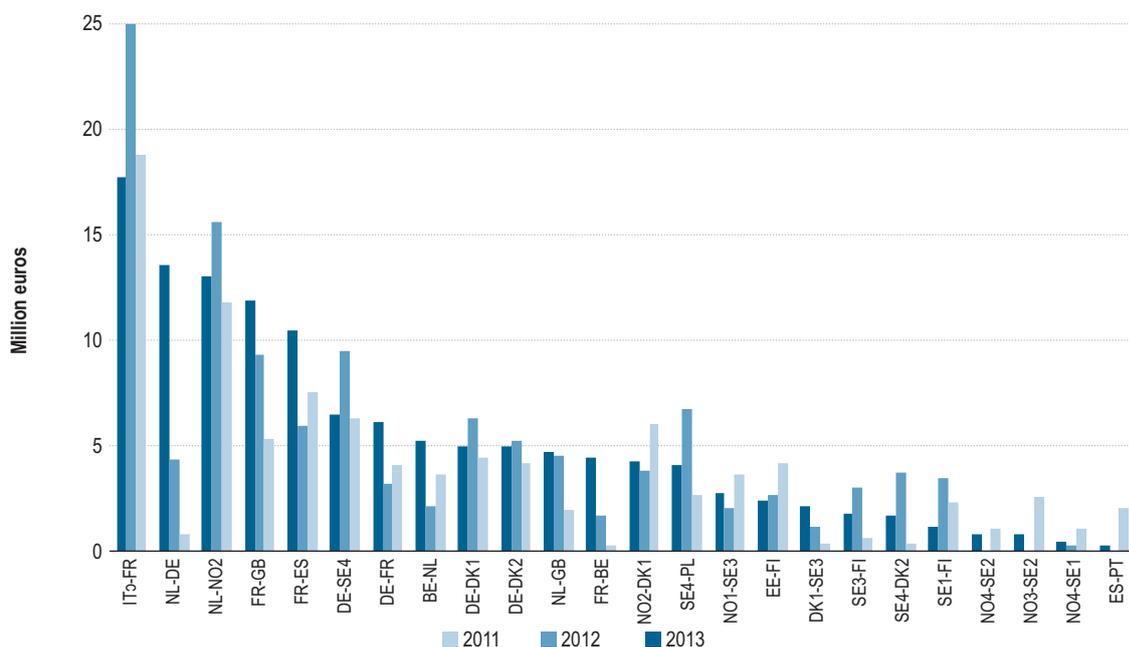
166 Due to mainly ramping constraints on an interconnector, congestion rents are more accurately assessed by means of nominations rather than cross-border capacity.

167 APX, BELPEX, EPEX SPOT, Nord Pool Spot, GME, OMIE and OTE. These were the same Power Exchanges which performed the simulations and provided the results shown in this section.

168 It can be argued that the 100 MW threshold used is to some extent an arbitrary value. Absolute values allow for comparing a border across the EU, although 100 MW is relatively large for some interconnectors and small for others. Secondly, this value is mentioned in Article 9 of Regulation (EU) No 543/2013 of 14 June 2013 as a threshold from which changes in transmission capacity should be reported. See: OJ 2013 L 163/1, 14 June 2013; <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:163:0001:0012:EN:PDF>.

296 Figure 48 shows the so-called ‘Incremental Gain’ for 2013, which is the difference between the gross welfare benefit from the Incremental scenario and the Historical scenario and which borders would benefit the most from making extra capacity available. For comparability, the figure also presents the results from the previous two MMR editions, i.e. 2011 and 2012¹⁶⁹. Note that extra capacity in this context is not necessarily associated with more investments, but could instead be related to more efficient methods of calculation capacity.

Figure 48: Simulation results: gross welfare benefits from incremental gain per border – 2011–2013 (million euros)



Source: PCR project, including APX, EPEX SPOT, Nord Pool Spot, GME, OMIE (2014)

Note: ∅ indicates that the zone is a GME zone; DK, NO and SE with a number refer to the different bidding zones in Denmark, Norway and Sweden. The results ranged for 2013.

297 As for previous years, the figure indicates that in 2013 additional capacity between Italy and France would have yielded the highest social welfare increase (i.e. almost an additional 16 million euros per year in 2013, which is, however, about a third less than a year before). Other interesting interconnectors in 2013 for improving capacity include the borders between: the Netherlands-Germany (on this border, the social welfare increase nearly tripled between 2012 and 2013 from 4 million euros per year to 13 million, respectively), Netherlands-Norway, Netherlands-Germany, France-Great Britain, France-Spain and Germany-Sweden.

298 This indicator should be further developed to become a monitoring tool which can be used to assess the utilisation of the existing network and track the progress of market integration.

169 Different versions of the algorithm were used for the two years.

3.3 Improving the functioning of the internal market: removing barriers

299 This section refers to the different features of the ETM in order to illustrate how it can contribute to removing the identified barriers to further integration of the IEM.

3.3.1 Utilisation of cross-border capacity in the intraday and balancing timeframes

300 Cross-border capacities are offered to the market and traded in different timeframes. After the forward and day-ahead timeframes, remaining capacities are offered for trade during the intraday timeframe and for exchanges in the balancing timeframe. This section presents a review of the use of capacities in these two timeframes with a view to identifying the remaining barriers to the further integration of the Internal Electricity Market. First, it evaluates the impact of different capacity allocation methods on cross-border intraday trade. Second, it assesses the potential use of the remaining cross-border capacity after the intraday timeframe to further integrate the balancing markets.

Cross-border intraday trade

301 An intraday market is a market that operates between the gate closure of the day-ahead market and the intraday gate closure time (i.e. the point in time when energy trading for the intraday timeframe is no longer permitted).

302 The level of liquidity in intraday markets is a key element in achieving well-functioning intraday markets and efficient cross-border intraday trading. In particular, illiquid intraday markets may hinder the efficient utilisation of the available cross-border intraday capacity, while intraday cross-border trade may contribute to the development of liquidity in these national markets.

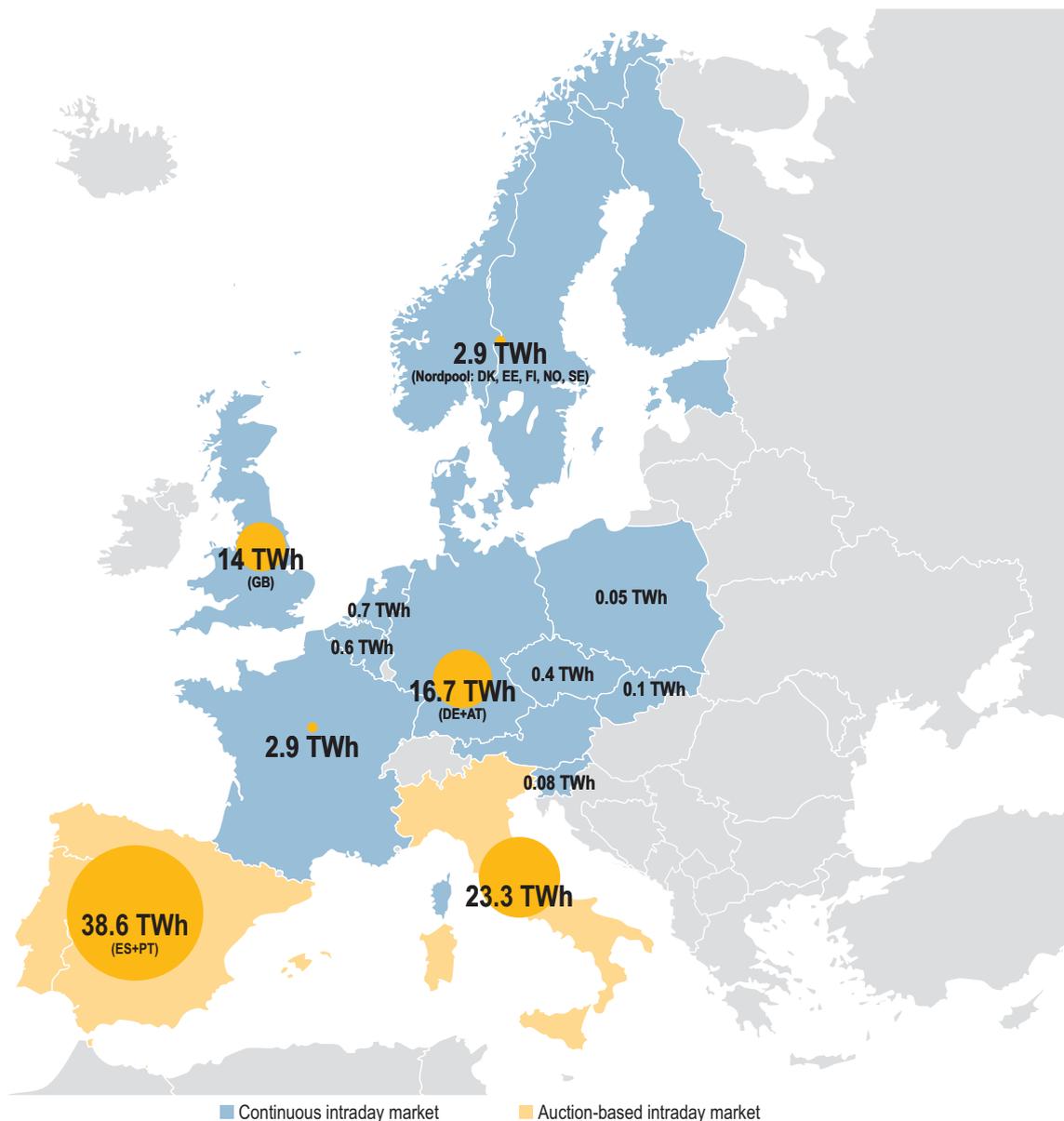
303 Figure 49 provides an overview of the liquidity level (expressed as traded volumes) in national organised intraday markets and their designs in 2013. The different levels of liquidity of national markets can be explained by many factors, including the amount of intermittent generation and how the market design addresses the uncertainty of wind (and other intermittent) generation forecasts, i.e. whether intermittent generation is incentivised to minimise its imbalances by adjusting its schedule in the intraday timeframe. For instance, the three markets with the highest levels of intraday liquidity (i.e. the Iberian, Italian and German markets) have a high level of intermittent generation. In Spain, with the highest volumes traded in the intraday timeframe, intermittent generation is incentivised in the same way as conventional generation to reduce their imbalances. In Germany, intermittent generators are not charged for their imbalances, while in Italy they are charged, although less than conventional generation.

304 In addition, other local factors affect intraday liquidity. These include whether the intraday market is exclusive¹⁷⁰ and whether portfolio bidding is allowed. In non-exclusive intraday markets, a portion of intraday volumes can be traded through bilateral trading (e.g. in Germany), thus reducing the intraday liquidity observed in the organised intraday markets. A similar effect occurs when portfolio bidding is allowed¹⁷¹, since market participants may prefer to refine their schedules internally rather than through the organised intraday market. This is opposed to unit bidding (e.g. applied in the Iberian Market) where generators have to submit a separate market bid for each of their generating units.

170 That is, whether the organised intraday market is the only way for a market participant to be able to change their nominated position after the day-ahead market and ahead of the final intraday gate closure.

171 Under portfolio bidding arrangements, a market participant can send one bid for energy in a single bidding zone, covering both all of its production assets and any demand it is responsible for procuring on behalf of end-customers.

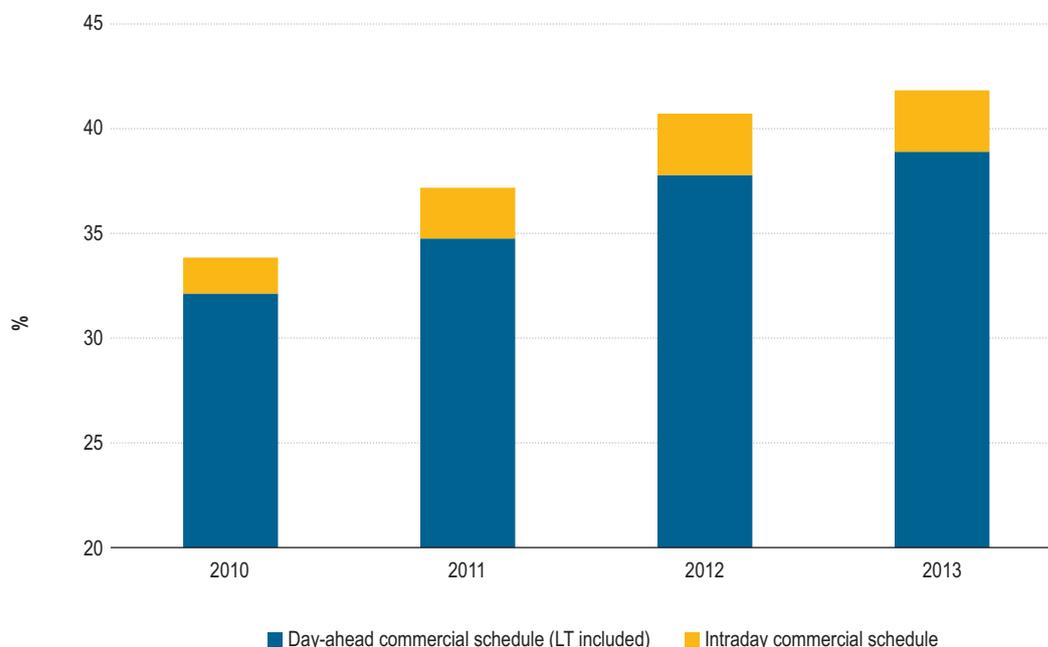
Figure 49: Intraday liquidity and design in national markets – 2013 (TWh)



Source: The CEER national indicators database (2014)

305 Figure 50 shows the relatively low utilisation levels of intraday EU cross-border capacity compared to the day-ahead timeframe (including long-term nominations) between 2010 and 2013. It also shows that, in 2013, the utilisation of cross-border capacity in the intraday timeframe remained virtually unchanged compared to 2012, whereas between these years the use of capacities in the day-ahead timeframe increased by 3%. Capacity underutilisation is not necessarily an inefficient outcome, since electricity market prices may not have justified a trade at the time the capacity was offered, i.e. there was no scarcity. More detailed analysis, including price information, is required to assess the level of efficiency in the use of cross-border capacities. The consistency of intraday price differentials with intraday cross-border trade is one of the elements analysed in what follows.

Figure 50: Evolution of the annual level (average values) of commercial use of interconnections (day-ahead and intraday) as a percentage of NTC values for all EU borders – October 2010–2013 (%)



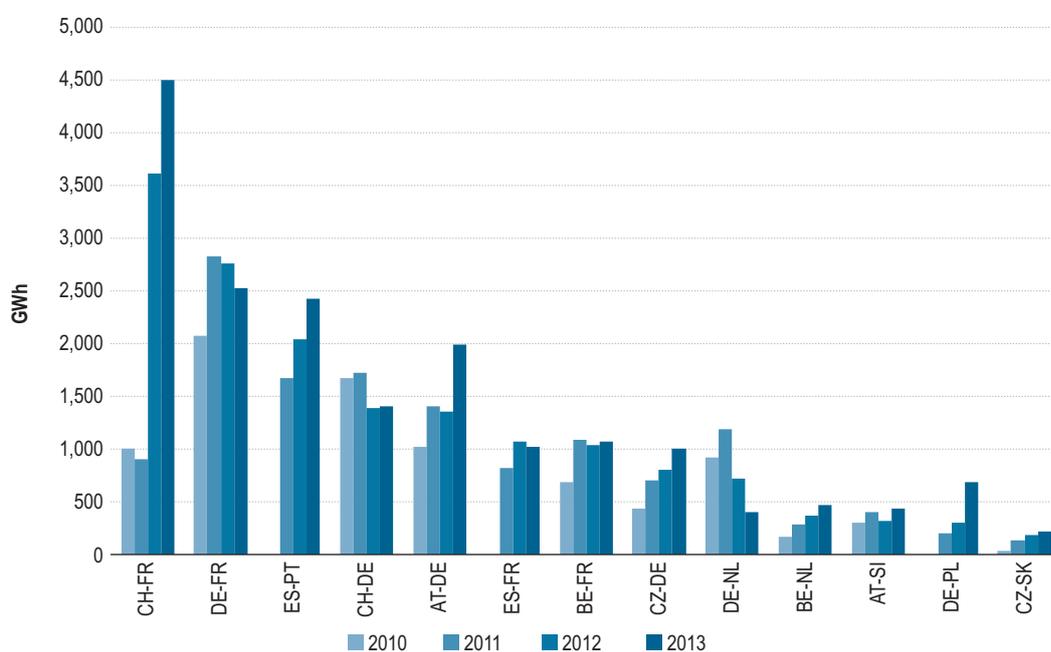
Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note: More than 40 EU borders were included in the analysis.

306 Figure A 9 in annex 10 shows the cross-border capacity available after the day-ahead gate closure per border. In 2013, the available cross-border capacity was not, on most borders, an impediment to developing cross-border intraday trade. However, there are some directions where less than 10% of the capacity remains available for use in the intraday timeframe, such as from Austria to Italy, France to Italy or Slovenia to Italy. On other borders where congestion is frequent (e.g. in the direction from Norway to the Netherlands, where on average less than 15% of cross-border capacity is still available after the allocation of capacity in the day-ahead timeframe), it is often argued¹⁷² that there could be an added value in reserving some day-ahead cross-border capacity for potential use in the intraday or balancing timeframes. This added value is associated with the potential use of interconnectors for exchanging reserve capacity (e.g. flexible reserves) in order to have the option of using it during the intraday or balancing timeframes in case of unexpected events. An assessment of the potential benefits from reserving day-ahead cross-border capacity for its potential use in the intraday or balancing timeframes would require a sophisticated welfare analysis to calculate the value of using the network capacity in different timescales. This analysis falls outside the scope of this report.

307 Figure 51 shows an upward trend in traded volumes since 2010 in the intraday timeframe. In 2013, the most significant progress compared to 2012 was recorded on the borders between Switzerland and France, and between Austria and Germany. The increase in trade followed the introduction of regulatory changes in the respective intraday markets. Since June 2013, the allocation model on the Swiss-French border includes continuous implicit intraday allocation, in parallel with the previous explicit allocation system. This is considered as an interim step towards the full implementation of the intraday Target Model¹⁷³. On the Austrian-German border, the improvement took place following the expansion of the continuous intraday market to Austria in October 2012.

Figure 51: Level of intraday cross-border trade: absolute sum of net intraday nominations for a selection of EU borders – 2010–2013 (GWh)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note: Only borders with aggregated intraday nominations above 200GWh in 2013 are shown.

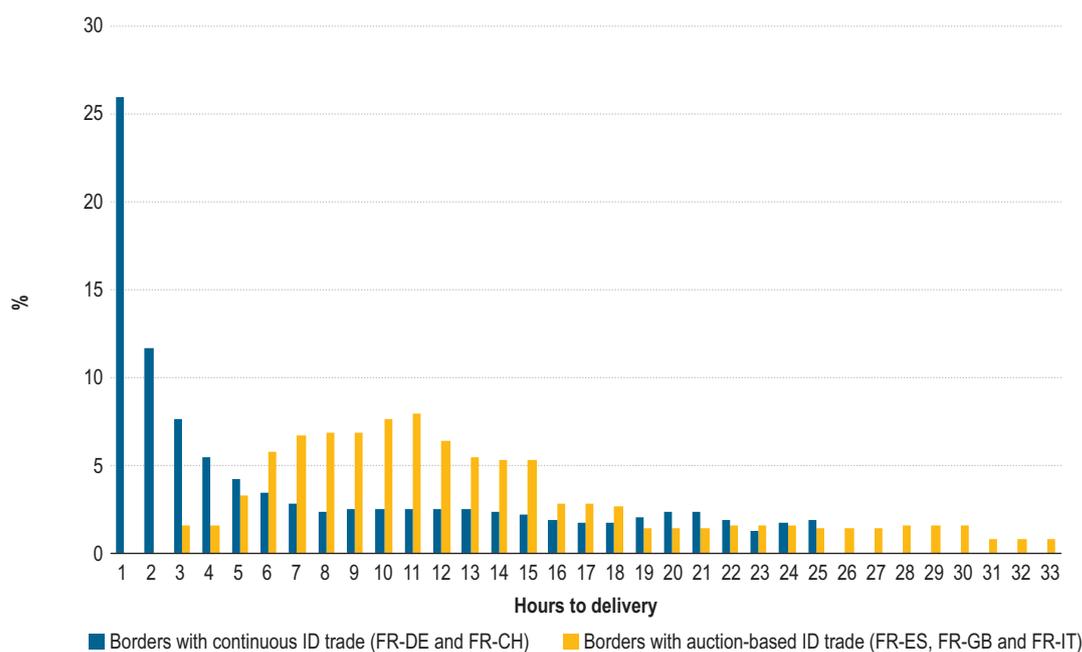
308 For the intraday timeframe, the ETM envisages an implicit cross-border capacity allocation mechanism using continuous trading on electricity markets, with reliable pricing of intraday transmission capacity reflecting congestion. This model aims, among other things, to provide market participants with a fast (on short notice) and flexible way of adjusting the portfolio of market participants, which is particularly important in view of the increasing share of variable RES-based generation, and to allow for the efficient use of the available intraday cross-border capacity. The ability of the various intraday cross-border allocation methods to provide flexibility and to realise an efficient use of the interconnectors is assessed in what follows.

309 The ability of cross-border intraday trade to allow close-to-real-time trading can be regarded as an indicator of flexibility. Figure 52 shows that intraday capacity allocation methods featuring continuous trading allow for close-to-real-time trade as opposed to methods which are based on implicit or explicit auctions.

173 According to the Framework Guidelines on Capacity Allocation and Congestion Management for Electricity, explicit access is considered as a transitional arrangement until sophisticated products which meet the needs of market parties are developed. The removal of direct explicit access for each border will be subject to consultation with market parties and then approval by the relevant NRAs.

- 310 The extra flexibility offered by continuous intraday trading compared to other designs appears to be valued by the market. According to Figure 52, almost half of the intraday capacity (45%) on the analysed borders featuring continuous intraday trading is requested and allocated between one and three hours prior to delivery in 2013. This close-to-real-time capacity demand indicates that intraday markets serve balancing needs for market players associated with RES.

Figure 52: Allocation of intraday cross-border capacity according to the time remaining to delivery for a selection of borders – 2013 (%)



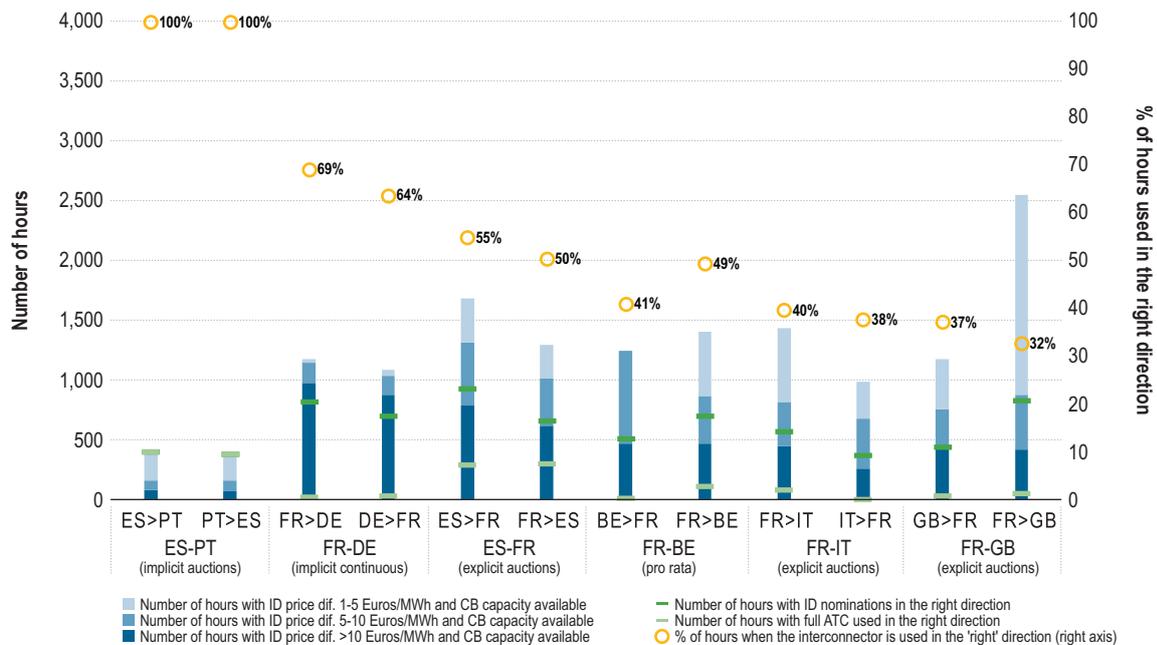
Source: CRE (2014)

- 311 Assessing the level of efficiency of cross-border capacity in the intraday timeframe is not straightforward. The main challenge stems from the lack of a unique intraday price for the two areas across a given border and time unit, as opposed to the day-ahead market, where a single price is usually cleared for every price area and time unit (typically one price for every hour). Based on these prices, an indication of the efficiency of cross-border trade can be provided by the share of hours when flows are set from the lower to the higher price zone in each hour (see section 3.2.2.1 where this is done for the day-ahead timeframe).
- 312 For the purpose of assessing the efficient utilisation of intraday cross-border capacity, the most representative prices are provided by the closest-to-real-time trades, since they are considered to better reveal the value of cross-border capacity at the time when final cross-border nominations are determined. In the case of several auction rounds, the closest-to-real-time trades can be valued at the price of the last auction for every delivery hour. In the case of continuous trading, Figure 52 suggests that the weighted average intraday prices should be aligned with the prices of the closest-to-real-time trades (due to their highest weight in the average)¹⁷⁴.

174 Indeed, power exchanges usually release a price reference (a clearing price in the case of auctions, and index or a weighted average in the case of continuous trading, etc.) which can be taken as a proxy for the true value of the energy traded at the intraday timeframe.

313 Figure 53 shows the consistency between intraday price differentials and final net nominations. First, it illustrates the potential of cross-border intraday trade per border by showing the number of hours with a price differential of more than 1 euro/MWh and more than 100 MW of capacity available in the ‘right’ economic direction’ on a given border-direction. According to this indicator, all borders included in the analysis have the potential to be used in the intraday timeframe. Even on the French-Italian border, usually congested from France to Italy in the day-ahead timeframe, cross-border intraday trade in that direction would be efficient during more than 1,000 hours in 2013. Second, the figure illustrates the efficiency in the cross-border intraday trade by showing the share of hours when the capacity available at the intraday timeframe is used in the ‘right’ direction¹⁷⁵. It shows that borders featuring implicit cross-border allocation methods (in particular implicit auctions¹⁷⁶) rank highest in delivering an efficient use of the interconnectors. The French-Italian border featuring explicit cross-border auctions records the lowest efficiency in the use of intraday cross-border capacity.

Figure 53: Potential for intraday cross-border trade and efficiency in the use of cross-border intraday capacity on a selection of EU borders – 2013 (number of hours)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Note 1: Since intraday liquidity (volumes traded) is relatively low in some markets, an arbitrary threshold of 50 MW was used for the analysis. The percentages illustrate efficiency by indicating the share of the hours when capacity is used in the right direction (>50 MW used) with intraday price differentials of at least 1 euro/MWh and sufficient availability of cross-border capacity (at least 100 MW).

Note 2: The French-German border features both implicit continuous and explicit OTC cross-border capacity allocation.

175 A threshold of 50 MW of cross-border capacity used in the ‘right’ direction was taken.

176 Figure 53 shows that implicit auctions seem to perform better than implicit continuous trade in terms of efficiency. However, this conclusion should be treated cautiously for two reasons. First, the analysis of implicit continuous trading has been performed only on a border (between Germany and France) where continuous trading runs in parallel with explicit allocation. Second, the indicator used in Figure 53 is based on volume-weighted average prices (in the case of continuous trading) and should be considered as a proxy for measuring efficiency.

- 314 Efficiency at the French-German border, featuring both implicit continuous and explicit OTC cross-border capacity allocation, is slightly lower than what could be expected. In theory, the implicit continuous allocation of cross-border capacity should tend to set the net cross-border flows from the lower to the higher price zone. Nevertheless, in 2013 the cross-border intraday net nominations on the interconnector were not always aligned with the intraday price differentials across the border. This could be due to a combination of factors. First, intraday liquidity on the French intraday market is relatively low¹⁷⁷. Second, continuous intraday trading might allow bilateral trading to take place at prices not fully aligned with the remaining bids and offers. These two elements could cause the weighted average intraday prices (the ones used for the analysis above) not to be fully aligned with the prices of those trades which determine the cross-border flows. Finally, the co-existence of two cross-border capacity allocation methods (implicit continuous and explicit OTC) might result in an imperfect alignment of prices and cross-border flows. The precise influence of all these factors on the efficient use of this interconnector needs to be further analysed.
- 315 Finally, Figure 53 shows that the full utilisation of the available intraday cross-border capacity in the presence of significant price differentials is not frequently achieved on most borders. This is usually due to inefficient cross-border allocation methods (mainly explicit mechanisms), combined with limited intraday liquidity.
- 316 The following conclusions can be drawn. First, cross-border capacity is not currently an impediment to developing intraday cross-border trade. Second, the combined analysis of available intraday cross-border capacity and intraday price differentials shows that a significant amount of cross-border capacity remains underutilised. Third, continuous allocation methods (either implicit or explicit) seem more adequate to provide the flexibility needed to accommodate the increasing amount of RES. Finally, implicit methods perform better in terms of efficiency than any other explicit allocation methods (either pro-rata or based on auctions)¹⁷⁸. In the future, the MMR will continue to track efficiency in the use of intraday cross-border capacities.
- 317 The implementation of the intraday Target Model will improve the liquidity of national intraday markets as well as efficiency in the use of intraday cross-border capacity. This will help create a truly integrated European intraday market that is able to efficiently balance and dispatch the increasing amount of RES close to real time. The implementation of the intraday Target Model was delayed several times in 2012 and 2013 due to the difficulties found by Power Exchanges in agreeing during the selection and negotiation process with the intraday platform provider. The rapid adoption of the Governance Guideline accompanying the CACM Comitology Guideline¹⁷⁹ should contribute to providing a more robust governance framework and therefore a more efficient decision-making process.

177 The intraday volumes in France are not as high as in other intraday markets such as the Iberian or Italian ones.

178 Until the problem of efficient capacity pricing within continuous allocation is solved, intraday capacity is implicitly allocated for free and on a first-come-first-served basis. It has to be noted that this approach may not be efficient when the capacity left over from the day-ahead market coupling becomes valuable in the intraday timeframe due to, e.g. significant changes in supply and demand or due to a sudden increase in transmission capacity following a recalculation of capacity in the intraday timeframe. However, the Agency expects that the future development of an efficient capacity pricing methodology, as foreseen in the draft CACM network code, will improve the overall functioning and efficiency of the intraday market.

179 At the 26th meeting of the European Electricity Regulatory Forum, Florence, 20–21 May 2014, it was announced that the Commission would propose to adopt the CACM Regulation as binding Guidelines (instead of a network code) in the Comitology procedure.

Cross-border exchange of balancing services

- 318 Electricity system balancing includes all the actions and processes performed by a TSO in order to ensure that the total electricity withdrawals (including losses) equal the total injections in a control area at any given moment¹⁸⁰. In view of this, TSOs maintain the system frequency within predefined stability limits by drawing on balancing services, which include balancing reserves and balancing energy. In addition, according to the Framework Guidelines on Electricity Balancing, TSOs are responsible for organising balancing markets and shall strive for their integration, keeping the system in balance in the most efficient manner. Among other elements, adequate imbalance settlement¹⁸¹ mechanisms and cross-border balancing exchanges are the key elements in ensuring that systems are balanced in the most efficient way.
- 319 An integrated cross-border balancing market aims at maximising the efficiency of balancing, by using the most efficient balancing resources, while safeguarding operational security¹⁸². This section reports first on the level of exchange of balancing services across EU borders in 2013 and second on the potential for further integration and harmonisation of balancing markets in Europe.
- 320 Currently, balancing markets in Europe are generally national in scope (or smaller) and supplying balancing energy (or reserves) across a border to an adjacent MS is not frequently allowed. Insufficient coordination among TSOs, the absence of EU-wide regulatory rules for cross-border exchange of balancing services and the lack of harmonisation of the main aspects of national balancing markets seem to be the main factors causing the lack of progress observed in the integration of balancing markets. In addition, some other challenges are frequently present in the balancing markets, including an insufficient level of competition due to high market concentration, which may result in higher balancing costs for end-users. An assessment of the performance of national balancing markets has not been performed for this report. Nevertheless, it should be noted that the integration (and adequate harmonisation) of balancing markets results in efficiency gains at the national level for at least the following reasons. First, it lowers market concentration, hence reducing the scope for exercising market power. Second, by integrating balancing markets, low cost resources are better utilised, yielding a decrease in overall costs for balancing services. And third, the harmonisation of the main aspects of national balancing markets should contribute to reducing distortions and to preventing an inefficient exchange of balancing services.
- 321 Figure 54 and Figure 55 show, respectively, the share of balancing reserves procured and the share of balancing energy activated abroad¹⁸³ in 2013. It illustrates that the exchange of balancing services across the analysed EU borders is currently limited. Exceptions include Estonia, Switzerland and Slovenia, where the amount of reserves contracted abroad represented 100%, 53% and 47%, respectively, of the system reserves in 2013, and France, where the share of balancing energy contracted abroad represented 15% of the total activated balancing energy in 2013.

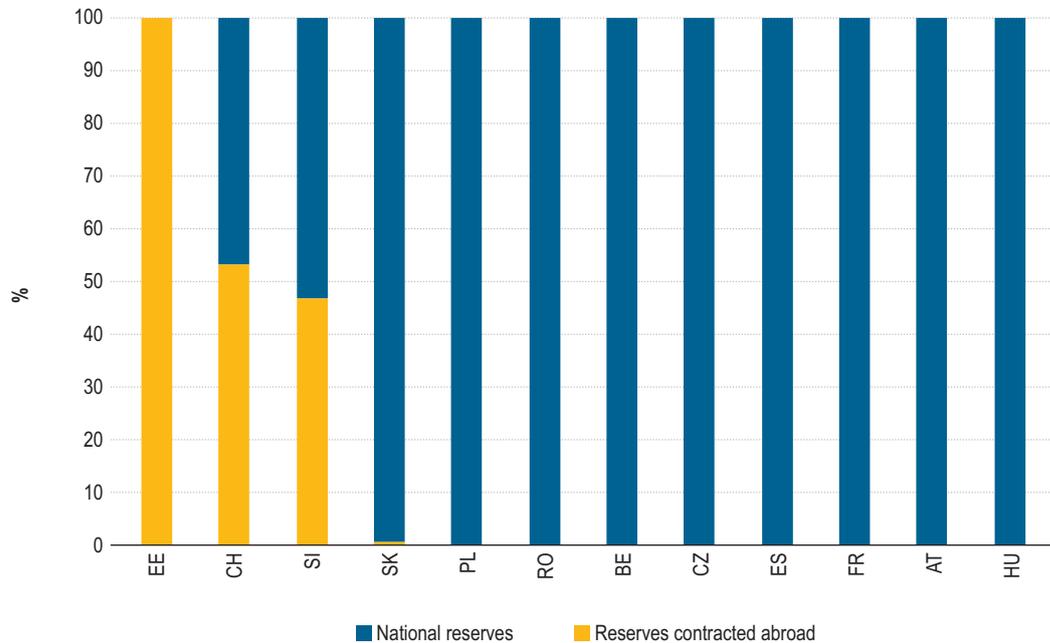
180 However, this section does not address the issue of system adequacy, which refers to the ability of the system to meet electricity demand at all times in the future.

181 Imbalance Settlement is a financial settlement mechanism aimed at charging or paying Balancing Responsible Parties (BRPs) for their imbalances.

182 Operational security refers to the transmission system's capability to operate within operational security limits (i.e. thermal, voltage, short-circuit current, frequency and dynamic stability limits).

183 The values of balancing energy activated abroad are taken from the survey among NRAs through the ERI in 2014. However, the answers did not include all the energy activated abroad, e.g. they excluded the activated balancing energy when the exchange is based on a multilateral TSO model with a CMO list (e.g. Nordic countries). Volumes of imbalance netting were also not included.

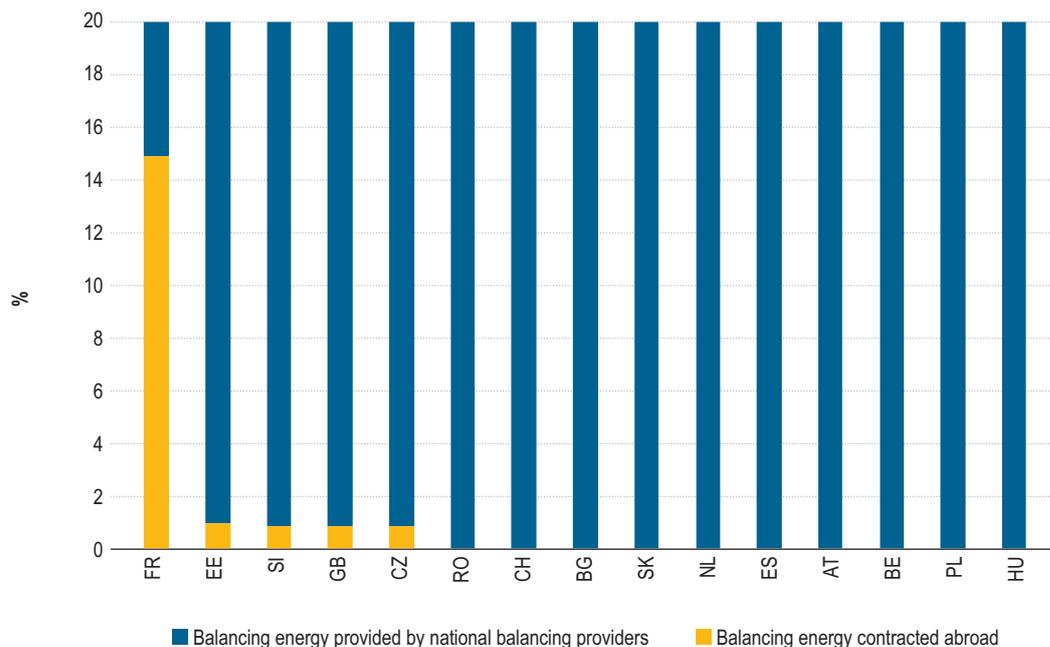
Figure 54: EU balancing capacity contracted abroad (energy and capacity) as a percentage of the amount of reserve capacity in national balancing markets – 2013 (%)



Source: Data provided by NRAs through the ERI (2014)

Note: The data on capacity (or reserve capacity) used to calculate the percentages presented in this figure refer to all types of reserves, with the exception of Spain, where manually-activated frequency restoration reserves are not included.

Figure 55: EU balancing energy activated abroad as a percentage of the amount of total balancing energy activated in national balancing markets (%)



Source: Data provided by NRAs through the ERI (2014)

Note: The data used to calculate the percentages presented in this figure refer to balancing energy activated from all types of reserves, with the exception of France, where only balancing energy from frequency restoration reserves is included. The figure does not include all the energy activated abroad, e.g. it excludes the activated balancing energy when the exchange is based on a multilateral TSO model with a CMO list (e.g. Nordic countries). Volumes of imbalance netting are not included.

- 322 In order to achieve an efficient exchange of balancing services, common standard products must be defined by TSOs and an adequate level of harmonisation of core aspects of balancing mechanisms should be achieved. This would allow those products to achieve sufficient liquidity and adequate competition in the markets where they are traded.
- 323 The exchange of cross-border balancing services can take several forms, depending on their level of integration. For example, the cross-border trade of these products can be based on the exchange of surpluses (i.e. what remains available after a TSO has secured sufficient services to meet the expected balancing needs of its own system) or can be based on the sharing of all the available resources by using a CMO list. According to the Framework Guidelines on Electricity Balancing, the target model for the exchange of balancing energy will be based on a multilateral TSO-TSO model¹⁸⁴ with a CMO list for the manually-activated frequency restoration reserves (FRR)¹⁸⁵ and replacement reserves (RR)¹⁸⁶, and on an equivalent concept for an automatically activated FRR.
- 324 In 2013, in parallel with the framework guidelines and network codes process, ENTSO-E has approved a number of pilot projects on balancing intended to gain bottom-up experience for the implementation of the European Balancing Market established in the Agency's framework guidelines¹⁸⁷. The text below provides more details on the extension of the current balancing mechanism between GB and France (BALIT) to the borders between Portugal and Spain and between Spain and France, in the context of the above-mentioned pilot projects.

184 A TSO-TSO model is a model for the exchange of balancing services exclusively by TSOs. It is the standard model for exchanging balancing services. A TSO-BSP model is a model for the exchange of balancing capacity or the exchange of balancing energy where the contracting TSO has an agreement with a BSP in another responsibility or scheduling area.

185 Frequency Restoration Reserves are the active power reserves activated to restore system frequency to the nominal frequency and for synchronous areas consisting of more than one load-frequency control area power balance to the scheduled value.

186 Replacement Reserves are the reserves used to restore/support the required level of Frequency Restoration Reserves to be prepared for additional system imbalances.

187 See: footnote 141.

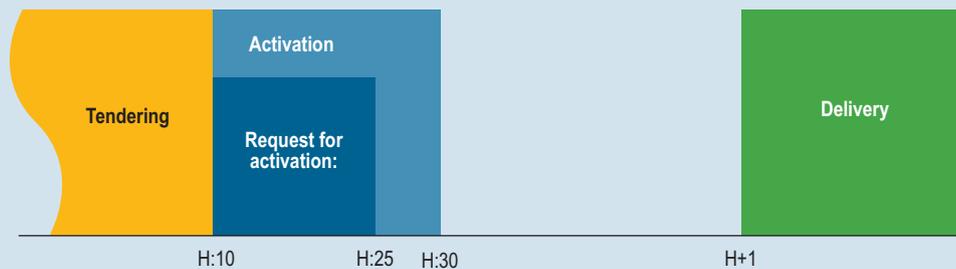
Case study 8: Extension of the BALIT mechanism to the SWE region

Within the ERI SWE region (Portugal, Spain and France), the three respective TSOs have been working on the implementation of a cross-border balancing scheme since 2010. These TSOs decided to use the BALIT platform to manage the exchange of balancing energy from replacement reserves. This platform was designed and developed by RTE to manage the exchange of cross-border balancing energy between Great Britain and France. The balancing exchanges were launched on 11 June 2014 at the French-Spanish interconnection and on 16 June 2014 at the Portuguese-Spanish interconnection.

The project consists of the implementation of bilateral TSO-TSO exchanges across the SWE borders, i.e. Portugal-Spain and Spain-France. Each TSO will be able to submit bids to the platform corresponding to their surplus of energy over its required margins, i.e. each TSO will only share bids that are not considered necessary to maintain its system control area within security limits. Close to real time, the TSOs will be able to activate bids submitted by a neighbouring TSO, which is subject to the confirmation that there is no danger to the security of the system from where the bid was submitted.

As soon as a TSO activates a cross-border balancing bid, this is notified to the TSO that submitted the bid. The timing for tendering and activating cross-border balancing bids is depicted below in figure i. It shows that 50 minutes before delivery, the tendering process is closed, i.e. no more bids can be submitted to the platform. TSOs can then request the activation of cross-border bids no later than 35 min. ahead of delivery time. The activation of bids must be confirmed shortly after (30 min. ahead of delivery time at the latest).

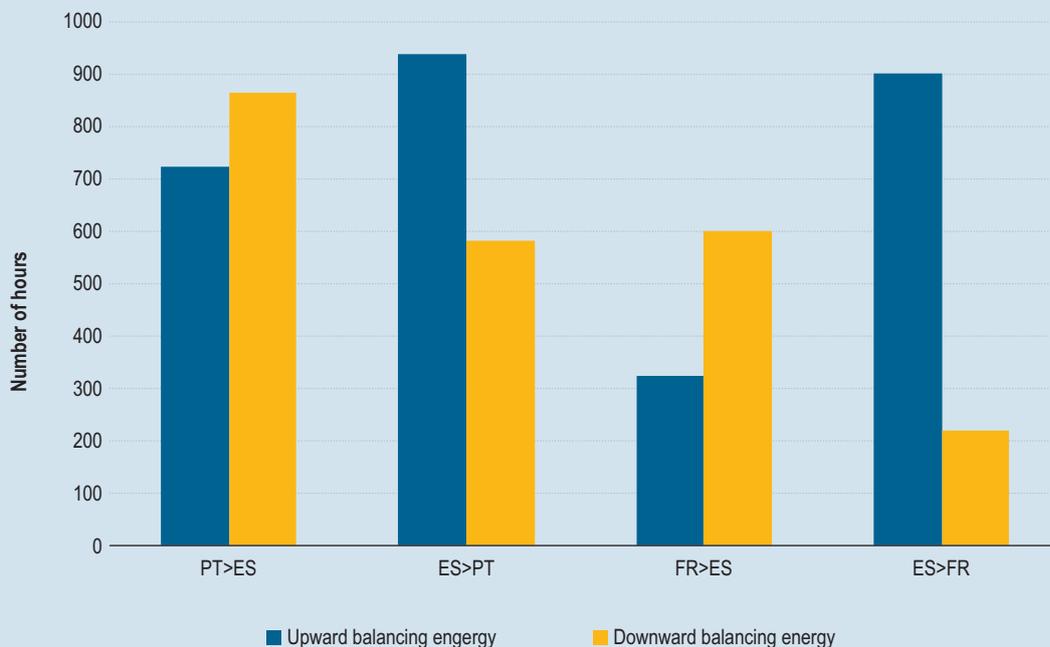
Figure i: Schematic representation of the tendering and activations of balancing bids in the BALIT mechanism applied in the SWE region.



Source: CNMC, CRE and ERSE

Figure ii provides an indication of the potential benefits that could be achieved by the exchange of balancing energy in the SWE region. The figure shows the number of hours in 2013 when there was sufficient cross-border available capacity to exchange at least one block of 50 MWh in the economic direction (based on the observed marginal prices for upward and downward regulation).

Figure ii: Potential exchange of balancing energy in the SWE region – number of hours when the exchange of at least 50 MWh in the economic direction would have been possible, 2013 (number of hours)



Source: CNMC, CRE and ERSE (2014)

Note: Only those hours when marginal prices of balancing energy were available (the price is only revealed when there is activation of balancing energy) have been considered. Moreover, for simplicity the study does not take into account the possibility of netting imbalances. For these reasons, the number of hours shown in this figure should be considered as a conservative estimate of the potential for the exchange of balancing energy from replacement reserves in the SWE region.

The estimates above suggest that perceptible benefits can be expected from the introduction of this mechanism in the SWE region. However, the benefits are limited compared to systems based on a full CMO list, because the BALIT mechanism only allows for the trading of ‘surpluses’, meaning that the balancing energy from the most efficient available resources is not always activated.

The region will evolve towards deeper integration and will pursue the early implementation of the model envisaged in the Framework Guidelines on Electricity Balancing. This will be achieved by developing a multilateral platform to exchange standard products from manually-activated balancing energy from replacement reserves on the basis of common merit order list(s).

325 One of the simplest forms of exchanging balancing services is the netting of imbalances. This aims to prevent the counteracting activation of balancing energy by off-setting opposing imbalances between adjacent imbalance areas. The netting of imbalances results in an effective energy exchange from an area with an excess of energy (surplus) to an area with a deficit (shortage) subject to available cross-border capacity. A case study on imbalance netting across the Austrian-Slovenian border is presented below.

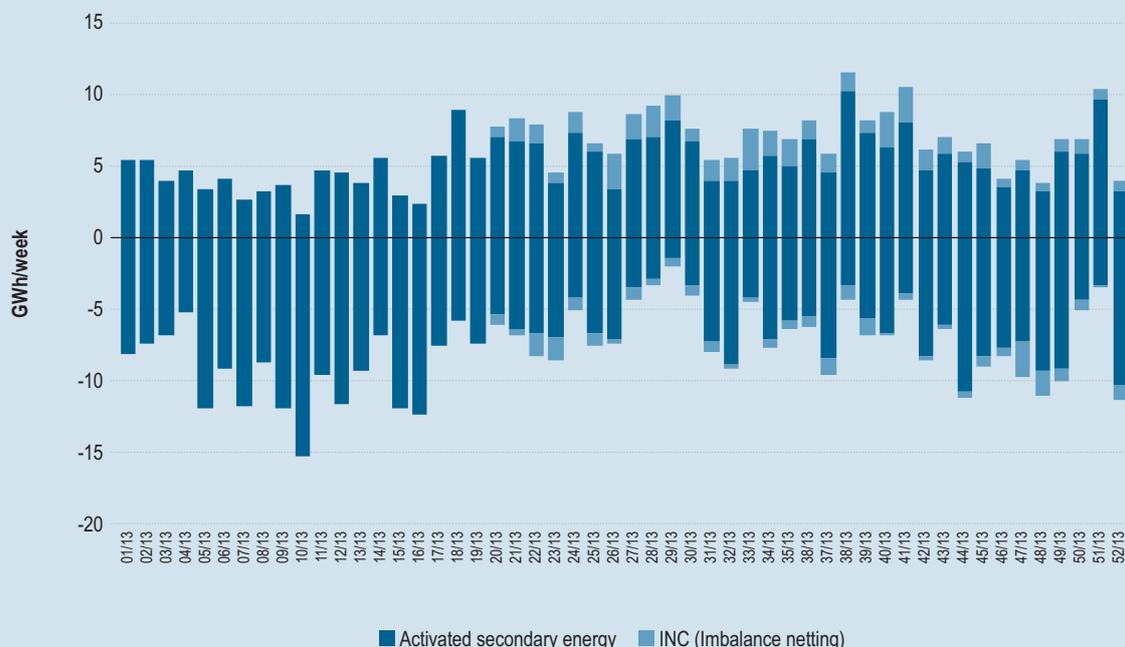
Case study 9: Netting of imbalances across the Austrian-Slovenian border

Imbalance Netting Cooperation (INC) between the Austrian TSO APG and the Slovenian TSO ELES started in May 2013. Before activating the balancing energy from automatic FRR¹⁸⁸ (aFRR), the optimisation module (operated by APG) compares the area control error (system imbalance) of both participating control areas. When the system imbalances of both TSOs have the opposite sign (direction), there is a potential for netting imbalances. The netting is performed continuously in real time up to the available cross-border capacity. When the netting is applied, the optimisation module sends adjusted signals to the respective controllers which are activating the aFRR for the remaining imbalances.

The financial settlement is based on equal sharing of costs and benefits for each Imbalance Settlement Period (ISP), where the costs represent the loss of income from the avoided downward activation of aFRR (downward opportunity price) and benefits represent the gains from the avoided upward activation of aFRR (upward opportunity price). The settlement price for the energy exchanged between the TSOs as a consequence of the imbalance netting is the average of the two opportunity prices.

From May 2013 until the end of 2013, 19% (11%) of upward (downward) aFRR needs in the APG area were met by applying imbalance netting (see figure i). This allowed for a reduction of 9% in the costs of aFRR in the control area of APG.

Figure i: Secondary Reserves activated in the APG Control Area – 2013 (GWh per week)

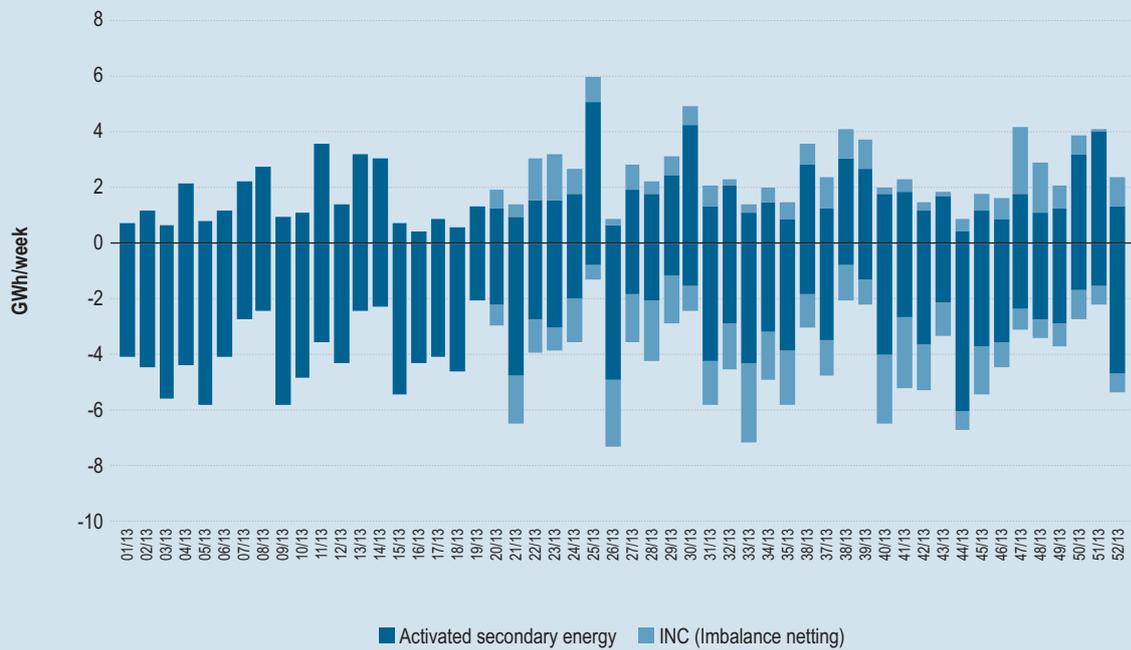


Source: APG

In the same period, ELES’ needs for upward (downward) aFRR were reduced by 29% (33%) due to imbalance netting (see figure ii).

188 Automatic FRR means FRR that can be activated by an automatic control device.

Figure ii: Secondary Reserves activated in the ELES Control Area, 2013 (GWh per week)



Source: ELES

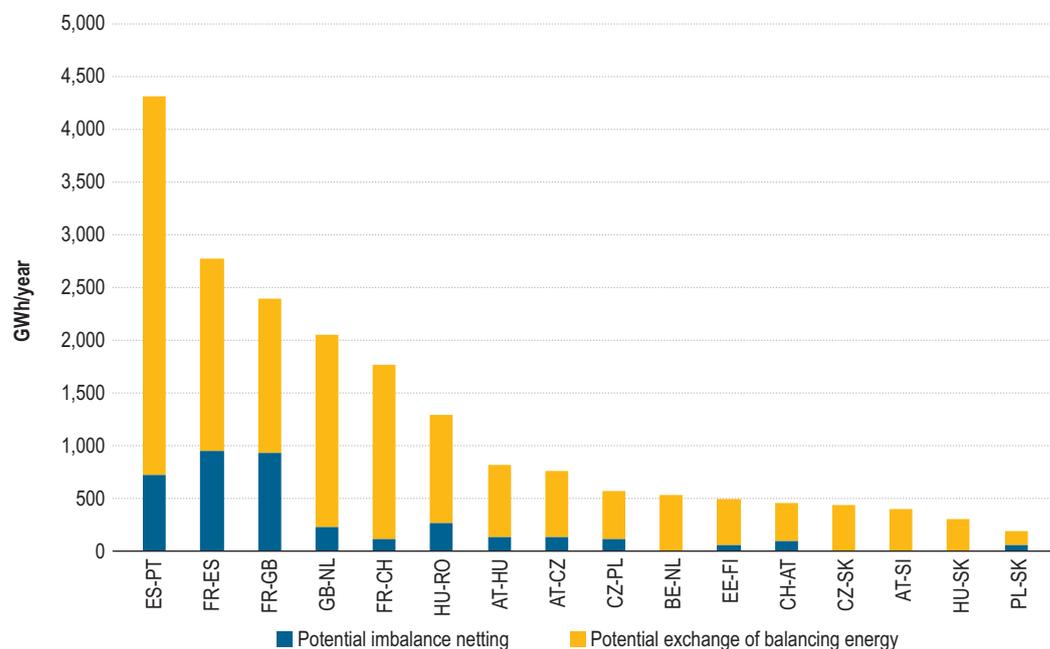
In April 2014, APG also joined the “International Grid Control Cooperation” (IGCC) project involving the cooperation of TSOs within, and on some borders of, Germany. Since then, imbalance netting in APG area has been performed in two steps. First, the imbalance netting is applied with ELES and second, the remaining imbalance of APG control area is netted within the IGCC project.

Like other imbalance netting projects in Europe, the INC project is considered successful primarily because significant efficiency gains in the activated aFRR (and consequently costs for imbalances) are obtained in a very short time and with little effort and implementation costs. Both INC and IGCC are contributing to the early implementation of the requirements contained in the draft Network Code on Electricity Balancing and thus to the European target model for electricity balancing.

326 While imbalance netting is important in and of itself, it is worth noting that it represents only a part of the potential efficiency gains from the exchange of balancing energy and in a wider sense from balancing market integration. Figure 56 shows the activation of balancing energy (GWh/year) that could have been avoided by applying imbalance netting across a selection of EU borders in 2013, together with the potential for a further exchange of balancing energy (assuming a full CMO list). The analysis is based on the hourly available capacity on a given border, the imbalance position of the systems across that border and the respective imbalance prices¹⁸⁹.

189 Full details on the methodology used to make these estimates are included in Annex 11.

Figure 56: Estimate of potential volumes of imbalance netting and further exchange of balancing energy across a selection of EU borders – 2013 (GWh/year)



Source: Data provided by NRAs through the ERI (2014) and ACER calculations

Note: On the following borders where imbalance netting is currently applied (CZ-SK, HU-SK, BE-NL, AT-SI), no potential for imbalance netting is shown.

327 Figure 56 shows that the border between Spain and Portugal provided the highest potential for exchange of balancing energy (including imbalance netting) among the analysed borders, in terms of absolute volume of exchanged energy (GWh/year) in 2013. This can be explained by the relatively high volumes of activated balancing energy in the Iberian market, which is likely to be related to the high penetration of intermittent generation sources in these two electricity systems. The volumes of imbalance netting potential across the selected borders accounted for around 20% of the overall system imbalances in 2013, which means that approx. 20% of the activated balancing energy could have been avoided by applying imbalance netting.

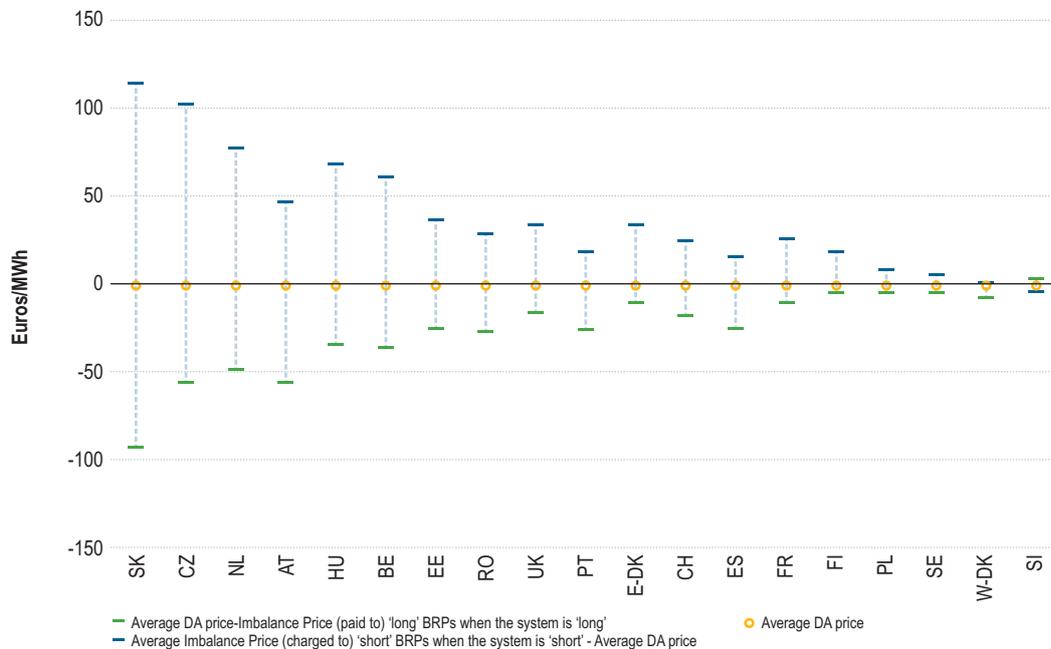
328 An accurate estimate of the welfare benefits obtained from the integration of balancing markets could be obtained only through having access to (and the ability to process) all the data corresponding to the bids and offers submitted by all BSPs from all the imbalance areas that are relevant for the analysis and by including the respective technical constraints for every settlement period¹⁹⁰. It is not the intention of this section to perform such a detailed analysis, which could cover many millions of data points. However, what follows is intended to shed some light on the potential efficiency gains of further integrating national balancing mechanisms.

329 An indication of the potential of further integration of national balancing markets is provided by the imbalance price differences across imbalance price areas in Europe. According to the Framework Guidelines on Electricity Balancing, the imbalance prices should ensure that BRPs support the system's balance efficiently, and incentivise market participants in keeping and/or helping to restore system balances. Moreover, imbalance prices should reflect the costs of balancing the system in real time.

¹⁹⁰ An example of this kind of analysis is included in the Impact Assessment on European Electricity Balancing Market Final Report, 2013. See: http://ec.europa.eu/energy/gas_electricity/studies/doc/electricity/20130610_eu_balancing_master.pdf.

- 330 Imbalance prices show the effective prices that out-of-balance BRPs pay (or receive) for deviations from their schedules. Currently, existing imbalance settlement mechanisms are far from being harmonised and do not always provide the right incentives to support the system efficiently. For instance, systems with upward imbalance prices – charged to BRPs – that are systematically lower than day-ahead (or intraday) prices can result in inefficiencies, as BRPs may prefer not to balance their portfolio by using the preceding (day-ahead or intraday) markets (where the underlying marginal costs are typically lower than in the balancing timeframe).
- 331 Figure 57 shows the average imbalance prices paid or received by BRPs across MSs, depending on whether they are short or long of physical energy compared to their declared positions. In order to compare the results across MSs, the following approach was taken. First, the imbalance prices were presented as the absolute deviation from the respective day-ahead prices in order to smooth the effect of different levels of (day-ahead) wholesale prices across MSs. Second, the imbalance prices were calculated for ‘short’ and ‘long’ BRPs only for periods when they contribute to the system imbalance¹⁹¹. During these periods, the imbalance prices for ‘short’ and ‘long’ BRPs tend to reflect, respectively, the price of upward balancing energy and downward balancing energy, irrespective of whether the imbalance settlement system is a one-price or two-price system¹⁹². Figure 57 shows a significant level of price dispersion between MSs, suggesting important benefits could be achieved by further harmonising and integrating¹⁹³ national balancing markets.

Figure 57: Weighted average of imbalance prices when BRPs contribute to system imbalance – selection of MSs – 2013 (euros/MWh)



Source: Data provided by NRAs through the ERI (2014) and ACER calculations

Note: For Sweden, arithmetic averages of its four imbalance price areas are shown.

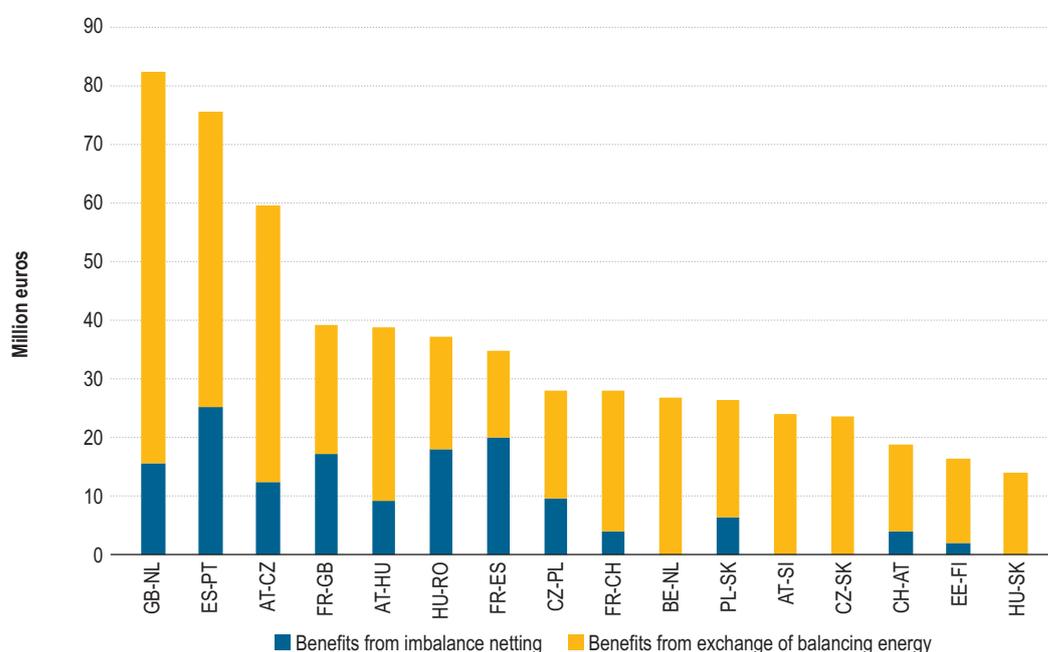
191 This means that the values presented are the imbalance prices for ‘short’ BRPs when the system is ‘short’ and similarly for ‘long’ BRPs when the system is ‘long’.

192 Explanations of typical one-price or two-price systems are provided in Annex 11.

193 Subject to sufficient available cross-border capacity.

332 Any analysis of the benefits of integrating balancing markets which is based on imbalance price differentials should take into account the above-mentioned shortcomings (lack of harmonisation and possible inefficiencies). In particular, because lack of harmonisation may alter the results of the calculations of how much balancing energy can be efficiently exchanged. The analyses presented below are based on the divergent imbalance prices across MSs and therefore should be considered as an indication of potential efficiency gains from further harmonising and integrating balancing energy markets. Figure 58¹⁹⁴ shows these potential benefits for a selection of borders, which total more than 500 million euros per year.

Figure 58: Estimate of potential benefits from the integration of balancing energy markets per border – selection of borders – 2013 (million euros)



Source: Data provided by NRAs through the ERI (2014) and ACER calculations.

Note: Imbalance netting over different types of interconnectors may require different technical solutions. Imbalance netting is currently applied over various alternating current (AC) interconnectors in Europe where TSOs simply set the input parameters of load-frequency controllers. Imbalance netting over direct current (DC) interconnectors (e.g. on the borders between France and Great Britain or between the Netherlands and Great Britain) is not currently applied in Europe, and would, in addition, require an active regulation of the energy flow over the DC interconnector. Potential benefits from imbalance netting have been calculated irrespective of the required technical solution. See also the note under Figure 56.

333 In summary, the exchange of balancing services across EU borders is currently very limited. In 2013, only around 1.7% of the balancing reserves and 1.2% of the balancing energy¹⁹⁵ were, on average, shared or exchanged across the analysed EU borders. Imbalance prices charged to ('short' and 'long') BRPs present a significant dispersion across the different EU imbalance price areas, which suggests important potential for harmonising national designs and the further exchange of balancing energy¹⁹⁶. In 2013, the application of imbalance netting could have avoided the activation of some 20% of the total activated balancing energy across the analysed EU borders. The value of further harmonisation of national designs, imbalance netting and the exchange of balancing energy in Europe is estimated at several hundred million euros per year. All in all, substantial benefits can

194 Details on the methodology used to make the estimates are shown in Annex 11.

195 See: footnote 183.

196 See: footnote 193.

be achieved from the exchange of balancing services, which reinforces the argument that Europe should pursue the further harmonisation and integration of balancing markets.

3.3.2 Long-term use of cross-border capacity

- 334 The forward electricity market offers market participants hedging opportunities against short-term (e.g. day-ahead) price uncertainties. The varied performance of competition and liquidity across forward markets in Europe determines whether market participants are able to hedge the short-term price risks sufficiently well and at a competitive price. A variety of forwards, futures, options, swaps, contracts for differences, etc. have been developed and are traded on various platforms.
- 335 In Europe, two forward market designs have emerged. The first design, implemented in the Nordic and Baltic countries and within Italy, relies mainly¹⁹⁷ on the market and a variety of products developed through the various market platforms (forwards, futures, options, swaps, contracts for differences, etc.). This design contains a set of hedging contracts for a group of bidding zones, and these contracts are linked to a hub price, which represents some sort of average day-ahead price within this group of zones (multi-zone hub). These hedging tools, developed and traded in the market, serve for both trade internal to a zone and cross-zonal trade.
- 336 The second design, implemented in nearly all MSs in continental Europe, also relies on the market, but gives an additional and specific role to TSOs with regard to cross-zonal trade. In this design, TSOs are responsible for calculating long-term capacities and auctioning transmission rights (TRs), enabling market participants to hedge against the specific risk of short-term zonal price differentials. In this design, there is a set of hedging contracts for each bidding zone which are linked to the day-ahead clearing price of this bidding zone (single-zone hub).
- 337 In a single-zone hub design, the liquidity of hedging products tends to depend, among other things, on the bidding zone's size. While large¹⁹⁸ bidding zones tend to have relatively good liquidity, the liquidity of hedging products in many small bidding zones is not satisfactory¹⁹⁹ and here, the TRs issued by TSOs play an important role. TRs may serve as a so-called bridge between a liquid financial electricity market (Market A) and an adjacent illiquid market (Market B). Market participants (e.g. suppliers holding contracts to deliver energy to customers in Market B) can simultaneously lock the price of electricity in Market A (e.g. by buying a forward energy product in Market A) and the difference between the energy price in Market A and Market B (by buying a TR from Market A to Market B). This effectively creates an alternative way to lock the price of electricity in Market B.
- 338 In a multi-zone hub design, the liquidity of hedging products linked to a hub price is usually high²⁰⁰ and the day-ahead price of individual zones can be hedged with contracts that provide the hedge for the difference between the zonal price and the hub price (contracts for differences).
- 339 In 2011, the Agency defined a target model for the forward timeframe which requires TSOs to issue Financial Transmission Rights (FTR) or Physical Transmission Rights (PTR) with Use-It-Or-Sell-It

197 In the case of Italy, there is also a specific role for the TSO, which auctions FTRs.

198 In terms of production or consumption.

199 See: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Market%20Report%20on%20Bidding%20Zones%202014.pdf.

200 See: footnote 199.

(UIOSI)²⁰¹ conditions, unless appropriate cross-border financial hedging is offered in liquid financial markets on both sides of an interconnector²⁰².

- 340 Hedging with TRs can have significant benefits for market participants. First, they can be used as an effective hedging tool by market participants, when alternative hedging instruments are not available, as explained above. This can help to increase competition in wholesale markets, which is particularly important in those markets with a dominant incumbent market player. Second, they could contribute to the liquidity of adjacent forward markets. This is the case if TRs are used to bid in neighbouring forward markets, i.e. when market participants act as arbitrage traders buying a forward contract in Market A and a TR from Market A to Market B in order to bid into the forward market of Market B, which would effectively increase the liquidity of the forward market of Market B. Nevertheless, market participants may prefer to use the TRs from Market A to Market B (combined with a forward energy contract in Market A) as an effective tool to hedge their position in Market B, which fragments the liquidity of forward markets. Finally, TRs, as opposed to financial products, are periodically auctioned and also lack well-developed secondary markets, which have not yet emerged. Market participants cannot easily buy them at any moment, like forward products in the financial market, while risk exposure is constantly changing.
- 341 The impact of TRs on the liquidity of adjacent forward markets may become more evident when the auction prices of TRs are not aligned with the energy price differentials on the relevant borders. What follows is intended to identify borders where energy price differentials are not reflected in the prices of TRs. Two approaches can be taken to assess this consistency. First, the price of TRs can be compared with the forward energy product prices differential that is observed when the cross-border auction was held, and second, they can be compared with the realised day-ahead price spreads.
- 342 The first approach is particularly useful when TRs are obligations, since the prices of TRs in the form of obligations should reflect (i.e. at least equal²⁰³) the forward energy price differentials (against which market participants wish to be hedged). However, this is less valid when TRs are options, since the option price represents the average of the expected day-ahead price differentials only when they are positive, i.e. in the economic direction (otherwise, the option is not exercised). Since most of the TRs in continental Europe are options, this approach has not been taken for the analysis.
- 343 The second benchmark is based on the assumption that the price of TRs in the form of options represent the expected positive day-ahead price differentials²⁰⁴ and that in the long term they should be equal or higher (positive risk premium) than the realised positive day-ahead price differentials²⁰⁵. The analysis presented below assesses in this way a selection of borders for which complete data are available.

201 UIOSI means an automatic application whereby the underlying capacity of the non-nominated PTRs is made available for day-ahead cross-zonal capacity allocation and whereby PTR holders that do not nominate to use their rights receive a pay-out corresponding to any positive market spread.

202 For a full explanation of different types of long-term transmission rights i.e. FTRs, PTRs and Contract for Differences (CfDs). See: https://www.entsoe.eu/fileadmin/user_upload/_library/consultations/Network_Code_CACM/20120619_Educational_Paper_on_Risk_Hedging_Instruments_review5.pdf.

203 They can be higher due to the risk premium that PTR holders are willing to pay.

204 Assuming full firmness of PTRs, which means that if the nominated capacity is not finally made available, the capacity holder is compensated with an amount equal to the price differential across the border.

205 It is a common practice in forward and futures pricing literature to calculate the ex-ante premium in the forward price as the ex-post differential between futures prices and realised delivery date spot prices (See: Shawky, H. A., Marathe, A., and Barrett, C. L. (2003), A first look at the empirical relation between spot and futures electricity prices in the United States, *Journal of Futures Markets*, 23(10), pages 931–955).

- 344 Table 3 shows that on most borders, PTR auction prices are on average below the recorded day-ahead price spreads. If this were systematically the case, it would imply that the value of cross-border capacities are retained by the owners of PTRs, instead of being fully transferred to the market (by, for example, allocating all the capacity in the day-ahead timeframe provided day-ahead market coupling is applied). On borders where market coupling is applied, the assessed differences are equal to the profit of a PTR holder, since the latter can decide at any moment to exercise the “Sell-It” option and receive the positive day-ahead price spread. On borders without market coupling, the PTR owner is faced with the uncertainty of nomination²⁰⁶ and one would also need to estimate the losses incurred due to wrong nominations in order to estimate the true profit from arbitrage. The results show that on borders where market coupling is applied, the spreads are lower, suggesting that market coupling has efficiency benefits in this regard.
- 345 On the border between Spain and Portugal, where FTRs (obligations) have been implemented, the observed ex-post risk premiums – corresponding to all the products (FTRs) auctioned in the period from June 2009 to December 2013 – was on average positive (0.12 euros/MWh)²⁰⁷.
- 346 Financial products such as those used to hedge the price difference between the zonal and the system price in the Nordic markets (contract for differences, CfDs, which were more recently renamed Electricity Price Area Differentials, EPADs) can be analysed in a similar way. Due to the limited data available, this analysis was not done for this MMR. Nevertheless a recent study on the efficiency of contracts for differences in the Nordic electricity market²⁰⁸ has made use of the same methodology as the one used in this section to calculate the risk premiums for PTRs. The results of the study show that the ex-post risk premiums of contract for differences traded in the Nordic market over the last few years do not present systematic negative values, as is the case with PTRs in Continental Europe.

206 On borders with explicit auctions, a capacity holder who nominates in the wrong direction would make a loss equal to the negative price spread.

207 Comisión Nacional de la Competencia (CNMC), 2014.

208 See: http://tiger-forum.com/Media/speakers/abstract/261405pm/petr_spodniak.pdf.

Table 3: Discrepancies between the auction price of PTRs (monthly auctions) and the day-ahead price spreads for a selection of EU borders and for the indicated periods (euros/MWh)

Border-direction	Day-ahead capacity allocation method	Average-auction price	Average price spread	Ex-post risk premium	Period analysed
GR > IT	Explicit	6.0	17.8	-11.8	2012-2013
CH > IT	Explicit	13.6	19.3	-5.7	2011-2013
AT > IT	Explicit	20.8	25.5	-4.7	2011-2013
AT > HU	Explicit	4.0	8.5	-4.5	2011-2013
FR > IT	Explicit	18.1	22.3	-4.2	2011-2013
IT > GR	Explicit	0.2	4.1	-3.9	2012-2013
AT > SI	Explicit	4.6	8.2	-3.6	2011-2013
DE > PL	Explicit	0.1	2.9	-2.8	2011-2013
SK > HU	Implicit	4.1	6.5	-2.4	2011-2013
PL > SK	Explicit	1.9	4.2	-2.3	2011-2013
DE > CH	Explicit	5.7	7.5	-1.8	2011-2013
PL > DE	Explicit	3.0	4.8	-1.8	2011-2013
AT > CZ	Explicit	0.0	1.8	-1.8	2011-2013
DE > CZ	Explicit	0.1	1.8	-1.7	2011-2013
CZ > DE	Explicit	0.9	2.6	-1.7	2011-2013
AT > CH	Explicit	5.8	7.5	-1.7	2011-2013
PL > CZ	Explicit	2.0	3.7	-1.7	2011-2013
CZ > AT	Explicit	0.9	2.5	-1.6	2011-2013
DE > NL	Implicit	4.0	5.5	-1.5	2009-2013
HU > AT	Explicit	0.4	1.7	-1.3	2011-2013
SI > AT	Explicit	0.1	1.2	-1.1	2011-2013
CH > DE	Explicit	0.0	1.1	-1.0	2011-2013
CH > AT	Explicit	0.0	1.1	-1.0	2011-2013
SI > IT	Implicit	15.2	16.0	-0.8	2011-2013
DK1 > DE	Implicit	3.0	3.8	-0.8	2011-2013
BE > NL	Implicit	2.1	2.9	-0.8	2009-2013
DE > FR	Implicit	3.9	4.5	-0.6	2009-2013
HU > SK	Implicit	0.1	0.6	-0.5	2011-2013
IT > FR	Explicit	0.4	0.8	-0.4	2011-2013
FR > DE	Implicit	1.1	1.5	-0.4	2009-2013
NL > DE	Implicit	0.2	0.4	-0.2	2009-2013
BE > FR	Implicit	1.2	1.4	-0.2	2009-2013
IT > CH	Explicit	0.1	0.2	-0.2	2013
NL > BE	Implicit	1.0	1.1	-0.1	2009-2013
FR > BE	Implicit	1.1	1.2	-0.1	2009-2013
DE > DK1	Implicit	1.1	1.2	-0.1	2011-2013
IT > AT	Explicit	0.1	0.1	0.0	2011-2013
IT > SI	Implicit	0.2	0.1	0.1	2011-2013

Source: CAO, CASC and Platts (2014) and ACER calculations

Note: The analysis has been made for the periods indicated for each border. The average auction price is the average value of all the monthly auctions in the period. The average price spread is the average differences of day-ahead prices for all the hours when the price differential is in the economic direction (otherwise, the value taken is zero, since the analysed PTRs are options, not obligations). For the average price differential, the hours during unavailability periods were excluded, because these periods are ex-ante known by market participants, i.e., before the monthly auction takes place. The ex-post risk premium is the difference between the two previous columns.

347 The observed differences between the marginal price of PTRs and the day-ahead price spreads may be due to several reasons. These reasons include the level of competition in the different auctions, the likelihood of curtailments and firmness regimes²⁰⁹, the volume of capacity offered by TSOs and the design of secondary markets. The precise influence of all these factors on the discrepancies between the auction price of transmission rights and the actual day-ahead price spreads will be further tracked in the market monitoring process and needs further analysis. This analysis should also contribute to improving the functioning and design of forward markets (including forward capacity allocation) in Europe.

3.3.3 Unscheduled flows and loop flows, re-dispatching and counter-trading

3.3.3.1 Introduction

348 As in previous MMRs, this section presents the development of unscheduled flows. However, it will present loop flows and the related welfare losses based on an alternative methodology compared to the one used for last year's MMR. It is structured as follows. First, it briefly recaps some definitions and the methodology applied to distinguish unscheduled transit flows from loop flows (Section 3.3.3.2). Second, it shows the evolution of unscheduled flows (Section 3.3.3.3) and, respectively, loop and unscheduled transit flows, as well as their likely impact on the volume of cross-border capacities made available to the market (Section 3.3.3.4) between 2011 and 2013. Third, it estimates the foregone welfare losses associated with loop flows and unscheduled transit flows (Section 3.3.3.5) on the basis of a counter-factual social welfare loss analysis. The section ends with conclusions and recommendations (Section 3.3.3.6).

3.3.3.2 Definitions and data

349 This Section applies the same definitions of physical flows as in last year's MMR²¹⁰, which were agreed among NRAs. It includes schedules (SCHs), loop flows (LFs) and unscheduled transit flows (UTFs). The sum of LFs and UTFs equals unscheduled flows (UFs) and the sum of SCHs and UTFs equals transit flows (TFs).

350 As opposed to SCHs²¹¹, UTFs are largely the result of insufficiently and inefficient calculations and allocation of cross-zonal capacity by TSOs. In continental Europe, UTFs can be mitigated by unifying capacity calculation with the application of a single flow-based method.

351 LFs originate from electricity exchanges inside bidding zones and are inherent to the EU zonal market design, with its highly meshed and synchronously connected grids. In fact, the effects of LFs on the efficiency of the IEM can be traced back to before market opening and have increased in recent years.

352 LFs are not captured by the cross-border congestion management mechanism, as they do not exactly follow the contractual paths. Instead, they flow to a certain extent through grids operated by neighbouring TSOs which are not directly notified to handle physical flows resulting from commercial transactions outside their control areas. This poses a challenge for TSOs to maintain network security and market efficiency. These flows and their effects can be mitigated by remedial security actions

209 E.g. the premium may not be positive if the capacity holder is not sure of being compensated with the price differential between the concerned zones in the relevant timeframe in the case of curtailment.

210 See: MMR 2012, page 94.

211 SCH is a declared flow resulting from a scheduling process and is subject to an electricity exchange between two different control areas and/or bidding zones.

in the short-term, by reconfiguring bidding zones in the medium term and by reinforcing infrastructure investments in the long term²¹².

- 353 While facilitating cross-border wholesale trade is a key objective of the IEM, the negative impact of UFs is twofold: (i) since the TSOs cannot control UFs with capacity allocation, they may reduce the capacity available for cross-border trade in order to ensure that the total physical flow on the network elements remains within security limits; and (ii) the TSOs have to keep on applying more remedial security actions (bearing higher costs) in order to ensure secure grid operation in their own responsibility areas while transporting 'foreign' electricity flows. The first impact may lead to a loss of social welfare, which corresponds to the foregone added-value with respect to a situation in which these cross-border capacities were available for cross-border trade. This loss of social welfare needs to be assessed by comparing the benefits delivered by the available cross-border capacity with and without the presence of UFs. The second impact relates to network security and the efficiency of the market in general, and may induce re-dispatching, counter-trading and curtailment costs. The high volatility and limited predictability of UFs create a challenge for operational planning. If remedial security actions are not available (e.g. due to insufficient coordination among TSOs or lack of flexible generation), UFs may lead to insecure grid operation.
- 354 LFs and UTFs can be indirectly calculated on the basis of PTDFs (Power Transfer Distribution Factors)²¹³. PTDFs provide information on how much power flows through a given network element (here, for interconnectors only) because of a cross-border exchange between two bidding zones, and are expressed as a percentage. Multiplying the actual cross-border exchange with the PTDF for a given interconnector yields the physical flow on that interconnector resulting from this cross-border exchange. Multiplying all cross-border exchanges with associated PTDFs and summing these products for a given interconnector provides the physical flows that result from all cross-border exchanges on this network element, i.e. flows resulting from capacity allocation, the TFs²¹⁴. Flows not resulting from capacity allocation (the LFs) are then calculated as the difference between PFs and TFs, and the UTFs are the difference between TFs and SCHs.
- 355 The flows not resulting from capacity allocation were provided to the Agency by ENTSO-E for 2011, 2012 and 2013; they were calculated with hourly resolution and contain some simplifications. First, only four different sets of PTDF factors representing different seasons in a year were used. Second, the resulting flows on each interconnector were aggregated per border²¹⁵. Third, PTDFs were calculated with the proportional Generation Shift Key, instead of following merit orders. The obtained data on flows not resulting from capacity allocation can thus be considered only as a proxy for calculating the total amount of LFs (and indirectly UTFs) on borders.

212 See: ENTSO-E's Technical report on bidding zones: https://www.entsoe.eu/Documents/MC%20documents/140123_Technical_Report_-_Bidding_Zones_Review__Process.pdf.

213 See: footnote 212.

214 Denoted as CFb in ENTSO-E's Technical report on bidding zones review process.

215 If one border contains differently located interconnectors, the aggregated result might not reflect the nature of the flows, e.g. the Czech-German border. If the aggregations are made per bidding zone instead of per border, the situation grows even less clear, e.g. Czech-(DE+AT) bidding zone or Swiss-(DE+AT) bidding zone.

3.3.3.3 Unscheduled flows

356 Figure 59 shows the average UFs in CEE, CSE and CWE regions²¹⁶, except Greece²¹⁷, in 2013, representing a major part of continental Europe. The level of this indicator on each border is expressed by the width of the arrow²¹⁸. The overall pattern mirrors last year’s findings, showing significant UFs exiting north Germany east and west, flowing through Poland, the Czech Republic, the Netherlands, Belgium and France and then entering southern Germany and Austria. In addition, significant UFs can be observed while exiting France to the south of Germany and from the south of Germany to France through Switzerland and Italy.

Figure 59: Average unscheduled flow indicator for three regions – 2013 (MW)



Source: Vulcanus (2014) and ACER calculations

Note: Average UFs are averaged hourly values in 2013.

357 While average UF values provide information about prevailing directions of UFs, Figure 60 shows the evolution of the aggregated sum of UFs in CEE, CWE and CSE regions in 2012 and 2013²¹⁹. The proportion of the UFs between the regions remained unchanged, and the total volume for all three regions decreased by 0.6% from 129.6 TWh in 2012 to 128.8 TWh in 2013. The amount of UFs in the CWE region is generally lower, because the Phase Shifting Transformers on the Dutch and Belgian borders block a significant quantity of physical flows and probably shift them to other borders.

216 In Regulation No. 714/2009 regions are defined in terms of countries; therefore the German-Austrian border could be attributed to the CEE region and CSE region. While on this border no capacity allocation takes place, unscheduled flows can be calculated. These flows have been, for the purpose of this report, assigned to the CEE region. Moreover, within a bidding zone, unscheduled flows cannot be divided into loop flow and unscheduled transit flow and therefore the German-Austrian border has not been included in the subsequent analysis in this chapter.

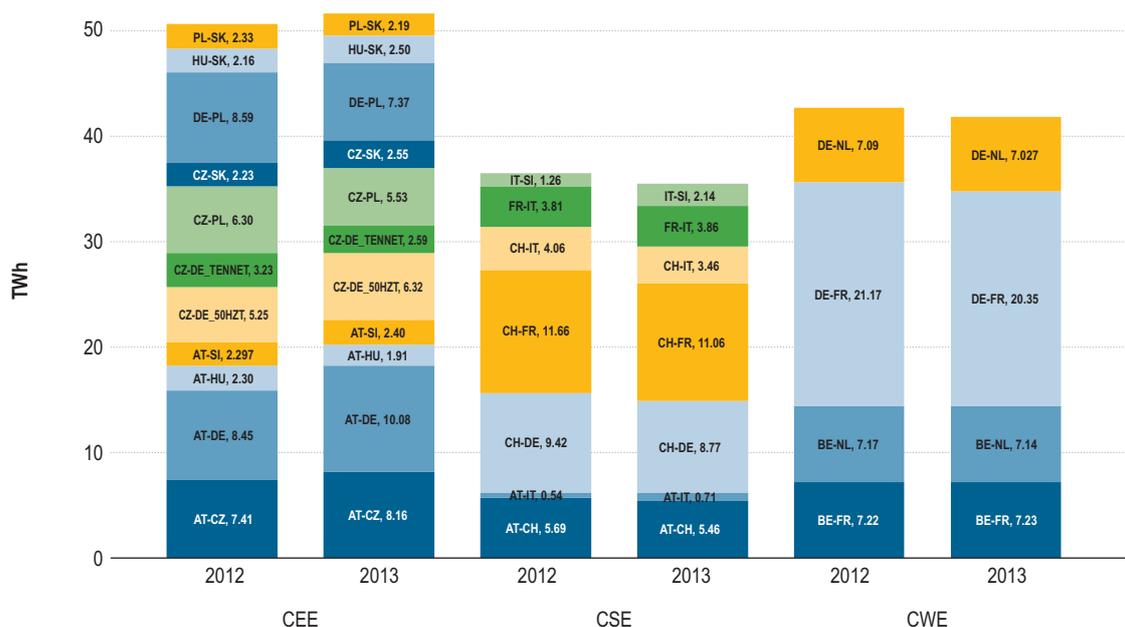
217 Greece is connected to the south of Italy only through a DC cable and therefore is not relevant for further UFs analysis.

218 For a comparison with the previous year, see MMR 2012, page 99.

219 For a comparison with previous years, see the MMR 2012, page 100.

358 Between 2012 and 2013, the level of UFs changed notably on some borders. UFs decreased most on the German-Polish and the German-French borders – in total by 1.2 TWh and 0.8 TWh each, representing 14% and 4% reductions, respectively. On the Austrian-German border, 50 Hertz German-Czech and Slovene-Italian borders, significant increases of 1.6 TWh (19%), 1.1 TWh (20%) and 0.9 TWh (71%), respectively, were recorded.

Figure 60: Absolute aggregate sum of unscheduled flows for three regions – 2012–2013 (TWh)



Source: Vulcanus (2014) and ACER calculations

Note: The calculation methodology used to derive UFs is not different from the one used for the previous MMR. The UFs are calculated with an hourly frequency; the absolute values are then summed across the hours and aggregated for borders belonging to the relevant regions.

3.3.3.4 Loop flows and unscheduled transit flows and their likely impact on the volume of cross-border capacities

359 In previous editions of this report, due to the lack of data, the Agency and CEER presented UFs as a proxy for LFs. By applying the methodology described in Paragraph 3.3.3.2, it is now possible to assess the respective impact of UTFs and LFs. The box below explains the different possible combinations of cross-border flows, as well as their impact on cross-border capacities.

Box: Explaining the directions and combinations of different types of cross-border flows

The aim of this section is to present a counter-factual analysis of the different kinds of electricity flows that can be observed ex-post. Given that TSOs cannot predict these flows, it should be underlined that the relation presented below between flows and capacity allocations is theoretical and has no policy aims. In the examples below, the impact of UFs (i.e. the sum of LFs and UTFs) on cross-zonal capacities is explained in detail with a view to clarifying the relation between these flows and the cross-zonal capacities made available by TSOs. As explained in paragraph (361), cross-zonal capacities are impacted by the volume levels of UFs and by their uncertainties, which are, together with other factors, reflected in so-called reliability margins (the levels of these reliability margins are not known to the Agency). TSOs, which determine the cross-zonal capacities made available for trade, apply these reliability margins in order to maintain network security during real-time operation.

An ex-post analysis of the levels and directions of LFs, UTFs and SCHs was performed on a selection of borders²²⁰, and their impact on cross-zonal capacities (expressed in NTCs) is explained in practice and in theory (i.e. ex-post). As the impact of reliability margins was not taken into account in the examples presented below, an ex-post observed positive impact of flows on cross-zonal capacity can actually be negative in reality, whereas the negative ex-post impact might in reality become even more negative. Figure i show examples of different combinations of flows.

Figure i. Different combinations of flows in one hour in 2012 for a selection of borders (MW)



Source: ENTSO-E, Vulcanus, EMOS (2014)

German-Dutch border, 3 January, hour 19:00

The LFs, UTFs and SCHs flowed in the same direction.

Theoretically, both the LFs (1,017 MW) and UTFs (472 MW) are expected to reduce cross-border capacity in the direction of the Netherlands and increase it in the direction of Germany. This is possible because of an assumption that physical capacity on this border is symmetrical (equal in both

220 The borders and hours were chosen randomly only for explanatory purposes.

directions) and that LFs and UTFs already consume 1,489 MW of capacity towards Netherlands, which should provide 1,489 MW more capacity towards Germany.

The actual NTC value in the direction of the Netherlands was 1,468 MW and 1,916 MW in the direction of Germany. Given that the maximum observed NTC on this border in 2012 was 2,449 MW in both directions, it can be concluded that UFs actually reduce capacities in both directions, but more significantly in the direction of the Netherlands.

Belgian-Dutch border, 23 January, hour 1:00

The LFs and UTFs both flowed against SCHs.

Theoretically, both the LFs (285 MW) and the UTFs (547 MW) should have a positive impact on the cross-border capacity in the direction of the Netherlands and a negative impact in the direction of Belgium. Hence, in the hypothetical situation of the complete absence of LFs and UTFs, the load on the interconnector would be 1,238 MW instead of 406 MW, and therefore less capacity in the direction of the Netherlands would be available.

However, the maximum capacity on this border was approximately 3,000 MW in 2012 in both directions, while for this same hour, the NTC values in both directions were 1,401 MW. In this case it can be concluded that cross-border capacity on this border and at this hour does not reflect the direction (or volume) of LFs and UTFs in specific hours, but rather the average uncertainties of these flows in the form of reliability margins.

French-Belgian border, 22 January, hour 19:00

The SCHs and UTFs flowed in the same direction, while LFs flowed in the opposite direction.

Theoretically, the UTFs (70 MW) are expected to reduce the capacity in the direction of Belgium, while the LFs (523 MW) are expected to positively impact the cross-border capacities while offsetting the TFs (1,810 MW + 70 MW) in the direction of Belgium. Hence, in the hypothetical situation of a complete absence of LFs and UTFs, the load on the interconnector would be 1,810 MW instead of 1,357 MW and less cross-border capacity would be available in the direction of Belgium (depending on the magnitude of UTFs and LFs, e.g. 800 MW instead of 70 MW, the situation would change accordingly), and with the absence of only LFs, the load on the interconnector would be 1,880 MW instead of 1,357 MW and again less capacity would be available in the direction of Belgium.

However, the maximum capacity on this border was approximately 3,000 MW in 2012 in both directions, while for this hour, the NTC value in the direction of France was 1,800 MW and 3,000 MW in the direction to Belgium. In this case, it can be concluded that LFs on this border indeed reduce the cross-border capacity in the direction of France and do not increase cross-border capacity in the direction to Belgium.

These examples show that, in theory, UFs (LFs and UTFs) can be expected to decrease or increase (depending on their direction and volume) cross-border capacities, while in practice only reductions can be observed. Two reasons for this can be identified. The first is that cross-border capacities are not only influenced by the volumes of UFs, but also by their uncertainties and related reliability margins. The second reason is that capacity calculation currently applied by the TSOs is not yet precise enough in terms of coordination, accurate common grid modelling, forecasting and calculation of uncertainties.

360 The aggregate absolute value of LFs amounted to 69.7 TWh in 2011, 70.7 TWh in 2012 and 67.8 TWh in 2013, while UTFs kept increasing from 85 TWh to 87,6 TWh and 94.7 TWh for the respective years. In order to show the frequency and magnitude of LFs and UTFs per border, Figure 61 presents the average LFs and UTFs in MW for the hours in 2013 when these negatively impacted cross-zonal capacity in the ex-post assessment. The results show that all the Swiss borders, German-Dutch, Czech-Austrian, Polish-Czech, Slovenian-Italian and other borders recorded a significant number of negatively impacted hours caused by LFs or UTFs.

Figure 61: Loop flows and unscheduled transit flows negatively impacting cross-border trade – 2013 (average LFs, UTFs, % hours/year)



Source: ENTSO-E, Vulcanus, EMOS (2014) and ACER calculations

Note 1: The percentages of hours per year and averages were calculated as follows. First, every hour with a negative welfare impact on a border (LF or UTF flowing to the higher price area) was counted separately for LFs and UTFs, and then the total count of impacted hours in the whole year was divided by 8,784 to determine the percentage. Second, averages of LFs or UTFs in the impacted hours were calculated. Directions and borders fulfilling the conditions in less than 0.5% hours are omitted.

Note 2: Read the results as follows: on the Austrian-Hungarian border in the direction of Hungary, the condition that LFs (first row) flowed in the direction to the higher price area (having a negative impact on cross-border capacities) was fulfilled in 6% of hours in 2013 and the average LF amounted to 115 MW. The same applies for UTFs (second row), which amounted to 229 MW in 12% of hours in 2013. Similarly for the direction to Austria and other borders.

Note 3: For German-Czech border the Agency obtained only the aggregated values of LFs and UTFs. As shown in Figure 59 the UFs enter and exit this border, hence partially offsetting one another in the aggregated volumes, and thereby the figures presented for this border cannot show an adequate or comparable picture.

3.3.3.5 Welfare impact of loop flows and unscheduled transit flows

- 361 When assessing the effect of UFs on the amount of cross-border capacity, the assumption is that there is an optimum value for cross-zonal capacity on each border that represents the thermal limits of given network elements and the N-1²²¹ security criterion. However, the actual capacity available for cross-border trading deviates from the optimum capacity for two reasons. First, in the capacity calculation process, the TSOs try to forecast the amount of flows caused by internal exchanges in all bidding zones (i.e. LFs and internal flows), and second, they forecast the amount of flows caused by cross-zonal exchanges on other borders not included in coordinated capacity calculation (UTFs). Both calculations together result in the forecast UFs, and the optimum capacity is then reduced accordingly. However, as the forecasts of UFs are not deterministic, TSOs further reduce capacity, while including the reliability margin, which represents the uncertainty of these forecasts.
- 362 MMR 2012 analysed two selected borders in each of the CEE, CSE and CWE regions and estimated the potential welfare losses for these borders (including redistribution effects²²²) as follows. First, on a specific border, the maximum observed physical flows (without the top 1% of outliers) over the last three years served as a proxy of thermal interconnector capacity. This value was reduced with the maximum observed NTC value over the last year. This result was assumed to be the forgone cross-border transmission capacity due to UFs. Lastly, for each direction on a border, the volumes were multiplied by hourly day-ahead price differentials. The result was the value of lost welfare associated with UFs.
- 363 Due to more detailed data becoming available, this year's report applies a new methodology to estimate the welfare impact of LFs and UTFs. The new methodology builds on the basic assumption that UFs reduce cross-zonal capacity in the direction of its flow, but do not increase capacity in the opposite direction. Assuming the loss of capacity equals the amount of UF, the resulting welfare loss can be calculated as the volume of UFs multiplied by the day-ahead price differential whenever the UFs flow in the more expensive area. Conversely, if the UFs flow against the price differential, the associated welfare loss is zero. Once the welfare loss caused by UFs is known, it can be decomposed into the welfare loss caused by LF and the welfare loss caused by UTF, such that the sum of the two equals the welfare loss caused by UF²²³.
- 364 The key differences between the two methodologies – i.e. this year's and last year's – are the volumes of lost capacities against which the price spreads are multiplied. Last year, the calculation of the lost capacity volumes was based on an estimate using PFs and NTC values. The new methodology assumes that the amount of lost capacity equals the amount of UFs and therefore disregards any further reduction in capacity due to the uncertainty of UFs (reliability margin). The new methodology also enables the separation of welfare losses due to LFs and UTFs. This provides additional transparency and provides a basis for developing potential measures to mitigate problems in the short term (i.e. prior to more robust solutions such as a reconfiguration of bidding zones)

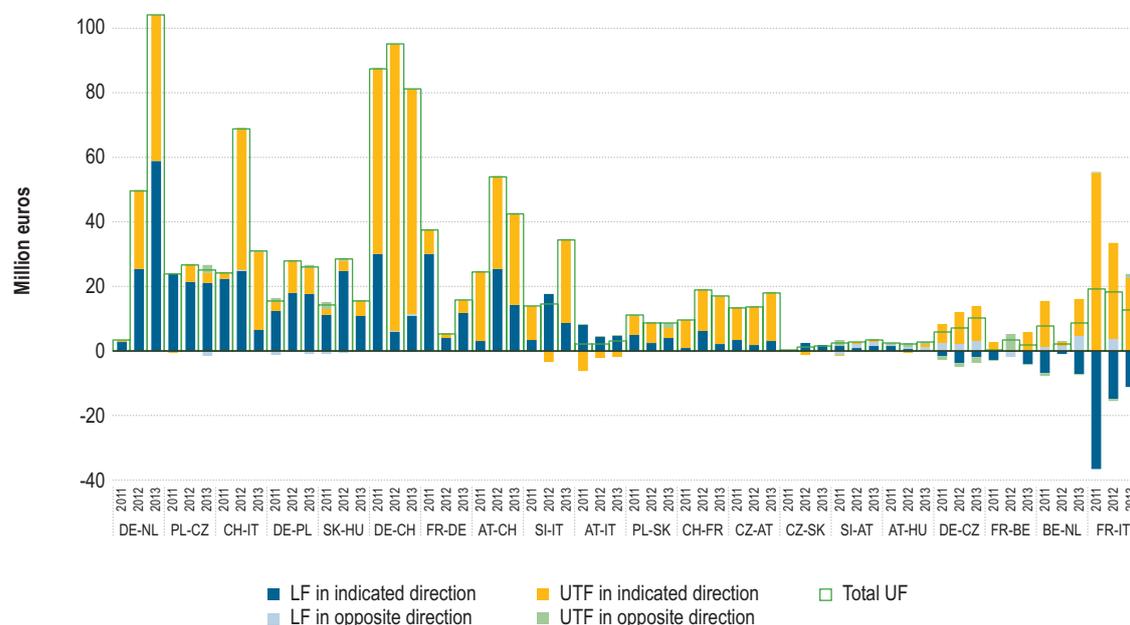
221 A situation in which at least one Contingency from the Contingency List can lead to deviations from Operational Security Limits even after the effects of Remedial Actions (source: ENTSO-E ICS methodology from 13 November 2013).

222 Each time this section mentions welfare losses, it should be taken to include redistribution effects.

223 When LFs and UTFs flow in opposite directions, one of them can produce a welfare gain and the other a welfare loss, while both together amount to the welfare loss caused by UFs.

- 365 It is important to mention that the overall calculated social welfare impact is:
- a) underestimated, as it does not take into consideration the loss of social welfare resulting from the uncertainty of UFs. This uncertainty obliges TSOs to calculate transmission reliability margins, which can reduce the cross-border capacity for trade (i.e. NTC) by more than the mere amount of UFs. The Agency and CEER consider that these unknown margins may substantially increase the loss of social welfare. In view of this, the Agency and CEER are preparing a modification to the currently applied methodology to accommodate this probably significant underestimation;
 - b) underestimated, since the analysis includes merely the existing aggregated borders, whereas including all interconnectors and 'internal' lines would provide a more accurate estimate;
 - c) underestimated, since lowering the amount of LFs on negatively influenced borders would imply a different bidding zone configuration with lower prices in the source areas of LFs and higher prices in sink areas of LFs, and hence increased price spreads; and
 - d) overestimated, as the price spread – against which the result is calculated – decreases with each additionally traded unit of transmission capacity until a (possible) complete price convergence, i.e. only so-called dead-weight losses should be taken into account, not the current price spread multiplied by the volume.
- 366 The results from the application of the new methodology are shown in Figure 62 for all national borders in the CEE, CSE and CWE regions. In 2011, the total welfare loss based on UFs was 324 million euros, while in 2012 it was 461 million euros and 469 million euros in 2013, which indicates a 44.7% increase over the last three years. The differences between 2011, 2012 and 2013 are mostly caused by changes in the price differences on the borders and to a much lesser degree to changes in the volumes of UFs. The share due to LFs was 37% in 2011, (120 million euros), 39.7% in 2012 (183 million euros) and 35.9% in 2013 (168 million euros). This result is considered a conservative estimate based only on welfare losses at the borders; it does not represent the total welfare losses resulting from sub-optimal bidding zone configuration. Such an estimate could be made only by conducting a comprehensive review of bidding zones, which is currently being performed by ENTSO-E.
- 367 The results of the new methodology suggest that both LFs and UTFs can, in an ex-post assessment, reduce the total amount of UFs-based welfare losses (i.e. when they flow in opposite directions). This means that one of them can actually produce welfare gains, as in its absence the UFs would be higher. This implies that besides losers, there can also be latent winners due to LFs and UTFs. The welfare losses caused to losers by LFs amounted to 184 million euros in 2011, 234 million euros in 2012 and 231 million euros in 2013, and were partially offset by the winners' gains of 64 million euros, 52 million euros and 63 million euros for the respective years. Combined, they amounted to a total welfare loss of 120-183 million euros per year, as presented in paragraph (366). The detailed statistics on flows and welfare effects are presented in Annex 12.

Figure 62: Estimated loss of social welfare due to unscheduled flows in the CEE, CSE and CWE regions – 2011, 2012, 2013 (million euros)



Source: ENTSO-E, Vulcanus, EMOS (2014) and ACER calculations

Note: The German-Austrian border is omitted, as Austria and Germany form a single bidding zone and have one common price reference. The German-Czech border uses one aggregated value of flows not resulting from capacity allocation for both of its interconnectors. LFs and UTFs then partially offset one another in volumes and thereby the presented result cannot be meaningfully interpreted.

3.3.3.6 Conclusion

368 UFs remain a challenge for the further integration of the IEM. Their persistence reduces tradable cross-border capacities, impacting market efficiency and network security. Welfare losses due to UFs have shown an increasing trend since 2011, reaching nearly half a billion euros in 2013, without taking into account any of the under/overestimates listed in paragraph (365). A preliminary estimate of the underestimate in paragraph (365) a) suggests that this uncertainty can substantially reduce the cross-border capacity made available for trade (i.e. NTC), even by more than the mere amount of UFs. The Agency and CEER consider that these unknown margins may considerably increase the calculated loss of social welfare. Thanks to newly available data (i.e. flows not resulting from capacity allocation), a more precise and detailed analysis is possible to decompose UFs into LFs and UTFs and to assess these separately. Moreover, it exposes the magnitudes of welfare losses based on LFs and UTFs and their proportion, which is around 40% and 60%, respectively.

369 The calculation of welfare losses caused by UFs was built on the assumption that cross-border capacity loss due to UFs is equal to the volume of UFs. In some cases, LFs or UTFs flow in the opposite direction to UFs, which means that they reduce the amount of UFs and therefore induce a positive effect on cross-border capacities. Such positive effects have been observed on a few borders only, most notably on the French-Italian border. The extent to which this positive effect actually materialises in practice is yet to be analysed in detail.

- 370 In order to increase the accuracy and transparency of the level of LFs, the Agency and CEER are of the opinion that a process to calculate the flows resulting from capacity allocation for each hour and for each interconnector without the simplifications mentioned in paragraph (355) should be established in the near future. The Agency and CEER welcome and encourage this improved transparency, as it provides an important basis for assessing the reductions in cross-zonal capacities for trade and its welfare impacts more adequately. In this regard, the monitoring of LFs should be continued.
- 371 The impact of UTFs can be mitigated with further TSO coordination in capacity calculation and allocation (implementation of flow-based methods), while the impact of LFs can be mitigated by improving the bidding zone configuration in the medium term and by making investments in transmission infrastructure in the long term. Moreover, the presented results of welfare losses due to LFs provide a starting point for developing a short-term solution for addressing the distributional effects of LFs. A proper review of bidding zones, leaving open the possibility of abandoning the current design mainly based on political borders, is aimed at mitigating the inefficiencies due to LFs and hence the true welfare losses caused by the sub-optimal bidding zone configuration.

3.3.3.7 Re-dispatching, counter-trading and capacity curtailments

- 372 To ensure operational security, different remedial actions are applied by the TSOs to relieve congestion on either cross-border or internal network elements caused by physical flows resulting from both domestic and cross-border trade. Some remedial actions do not result in significant costs and are preventive (e.g. changing grid topology), while others come as a cost to the system or to TSOs and may be either preventive (e.g. offering less cross-border capacity) or curative (e.g. re-dispatching and counter-trading, and curtailment of capacity already allocated). The curative measures are presented in what follows.
- 373 Re-dispatching is a measure activated by one or several TSOs by altering the generation and/or load pattern in order to change physical flows in the transmission system and relieve physical congestion. More specifically, this refers to a TSO requesting (when congestion appears) some generators or certain consumers to start or increase production or reduce consumption, and some other generators to stop or reduce production or increase consumption in order to maintain network security. Moreover, TSOs may apply countertrading, which is a commercial cross-zonal exchange initiated by TSOs between two bidding zones to relieve physical congestion. In this case, the precise location of generation or load pattern alteration is not pre-defined.
- 374 Table 4 shows network congestion-related volumes and costs of remedial actions, reported separately for re-dispatching and counter-trading.

Table 4 Network congestion related volumes and costs of remedial actions – 2013 (GWh, thousand euros)

Country	Re-dispatching		Counter-trading		Other	Contributions from other TSOs	Total cost
	GWh	thousand euros	GWh	thousand euros	thousand euros	thousand euros	thousand euros
UK	8,381	256,535	42	-7	92,988	0	349,516
PL	4,474	86,200	525	11,358	0	10,057	87,501
EE	0	0	38	1,123	0	0	1,123
CZ	34	144	0	0	0	-799	943
FI	6	428	12	450	0	22	856
LV	0	0	20	838	0	23	814
RO	11	702	0	0	0	0	702
DK	n.a.	228*	n.a.	228*	0	0	456
PT	9	0	0	0	99	3	96
ES	0	0	44	-54	0	-149	95
AT	248	n.a.	0	n.a.	n.a.	n.a.	n.a.
CH	11	n.a.	44	n.a.	n.a.	n.a.	n.a.
SI	3	0**	0	0	0	0	0
BG	0	0	0	0	0	0	0
HU	0	0	0	0	0	0	0
LU	0	0	0	0	0	0	0
NL	0	0	0	0	0	0	0
SK	0	0	0	0	0	0	0

Source: Data provided by NRAs through the ERI (2014)

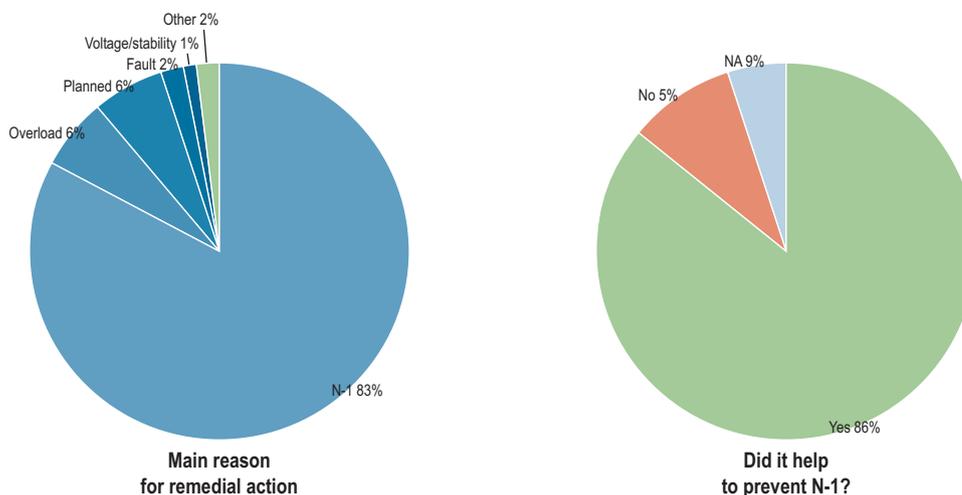
Notes: Data for 2013 are not directly comparable to the 2012 data, as the question in the ERI template differs. In 2012, the Agency requested all remedial actions, while in 2013 only congestion-related ones. Positive euro values for remedial actions refer to costs incurred to TSOs, negative values to their revenues, whereas, positive values for contributions refer to money received from other TSOs and negative to money paid to other TSOs. Austria, Belgium, Croatia, France, Italy and Switzerland did not provide details on costs or did not have the data available. Countries which are not present in the table did not submit any remedial actions data. * Denmark reported on the sum of both cost components; in the table it has been divided into halves. ** Slovenian costs for re-dispatching are covered by Italy.

375 Figure 63 extends the information summarised in Table 4 and shows the reasons for remedial action activations presented by the TSOs and whether they prevented or remedied N 1 violations.

376 Figure 64 shows that 5% (i.e. 296 cases) of the remedial action activations failed to prevent the N-1 violations from happening. According to the TSOs, 83%²²⁴ of these cases were caused by the UFs and only 17% by other causes.

224 N-1 violations were reported in only 7 countries (Austria, Czech Republic, Hungary, Poland, Slovakia, Slovenia and Spain); 10 countries reported no occurrences of N-1 violations.

Figure 63: Reasons for and results of network congestion related remedial actions in Europe – 2013 (MWh)



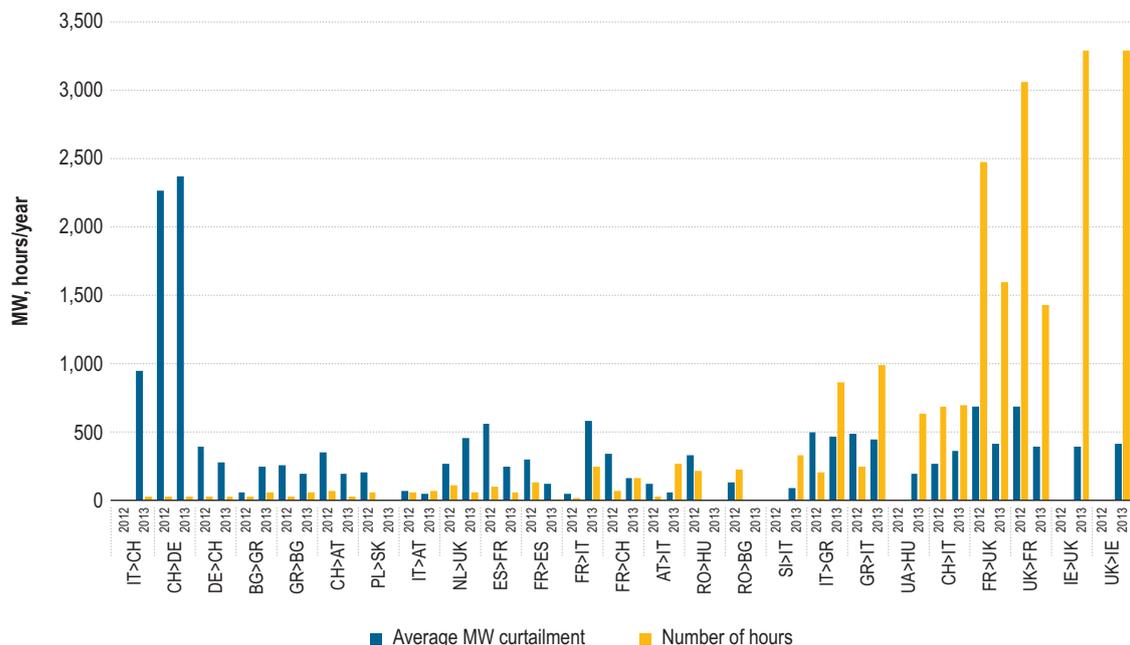
Source: Data provided by NRAs through the ERI (2014)

Notes: The percentages were calculated from the total amount of activations (12,746 activations in 17 countries), regardless of their volumes.

377 When dealing with emergency situations in which TSOs must act in an expeditious manner and when re-dispatching or countertrading is not possible, TSOs may curtail allocated capacity. Regulation EC No 717/2009 and the Framework Guidelines on CACM require that in the case of force majeure market participants owning the curtailed capacity should be reimbursed, whereas in all other cases market participants should be compensated for curtailed capacity. Such compensation should be equal to the price difference between the zones concerned in the relevant timeframe (market spread compensation).

378 Figure 64 shows the number of hours for a selection of borders for which cross-border capacity was curtailed, together with information on the average curtailed MW capacity in these hours.

Figure 64: Average curtailed capacities and number of curtailed hours per border – 2012 and 2013 (MW and hours/year)

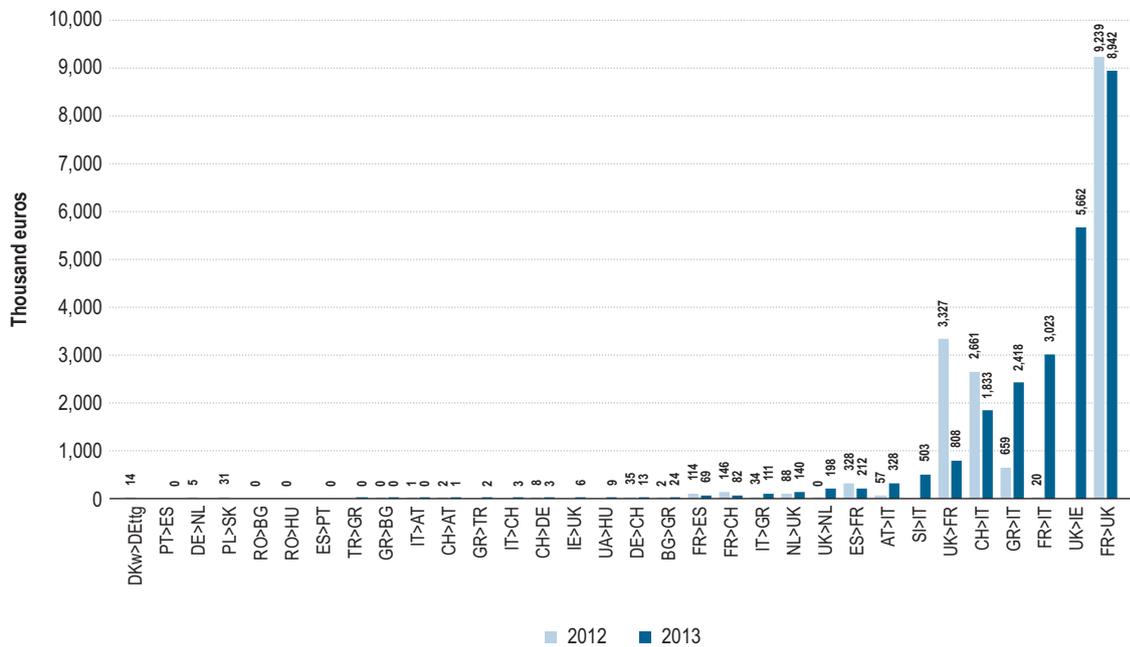


Source: Data provided by NRAs through the ERI (2014)

Notes: In this figure, ‘curtailment’ is defined as ‘long-term capacity curtailment’; it refers to a situation in which the sum of monthly and yearly auctioned capacity is higher in a specific hour than the day-ahead NTC value in the same hour. For the borders of FR-ES, FR-IT, FR-CH, FR GB, AT-CH, CH-IT and AT-IT in 2012 and CH-AT, ES-FR, FR-ES, FR CH, FR-UK, GR-IT, IT-GR, SI-IT and UK-FR in 2013 the data provided on the two sides of the borders were not identical, and average MW capacity curtailed and the average number of hours curtailed are reported. Only borders with more than 24 hours of curtailments per year are included.

379 A capacity curtailment, if implemented by a TSO, is followed by compensation payments paid to the holders of cross-border transmission rights. Compensation schemes still differ across borders and the EU. For instance, while the CWE region offers compensation capped at the value of the day-ahead price differential, other regions usually reimburse the original price paid at the transmission rights auction. These costs are usually split between the TSOs proportionally to the auction revenues received by each TSO. Figure 65 shows the curtailment costs for a selection of borders.

Figure 65: Total curtailment costs per border – 2013 (thousand euros)

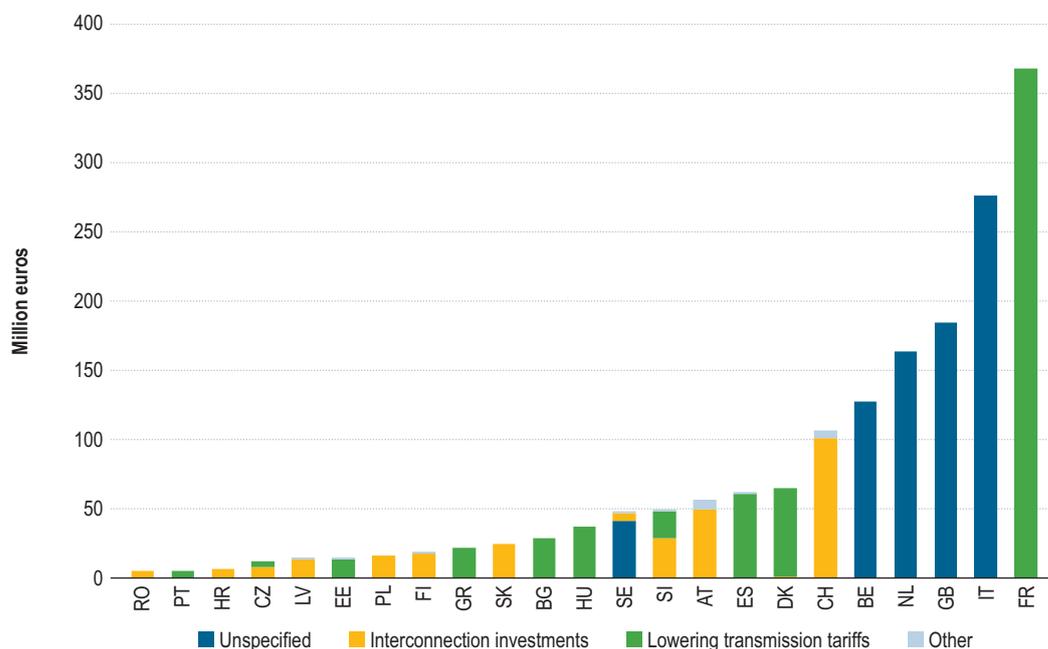


Source: Data provided by NRAs through the ERI (2013) and ACER calculations

Note: For the borders of FR-ES, FR-IT, FR-CH, FR-GB, AT-CH, CH-IT and AT-IT in 2012 and CH-AT, ES-FR, FR-ES, FR-CH, FR-UK, GR-IT, IT-GR, SI-IT and UK-FR in 2013 the data provided on the two sides of the borders were not identical and average total curtailment costs are reported.

- 380 On borders linked with DC interconnectors, and especially sub-sea cables, higher costs related to cross-border capacity curtailments can be observed, as the duration of curtailments on these borders is usually longer than on borders with AC interconnectors. Curtailment costs may also significantly increase on borders with capped market-spread compensation when the curtailment takes place in hours with a high price spread between bidding zones, compared to the originally paid cross-border capacity auction price.
- 381 Figure 66 shows the total congestion revenues and their decomposition, depending on how the TSOs spend them.

Figure 66: Congestion revenues – 2013 (million euros)



Source: Data provided by NRAs through the ERI (2014) and ACER calculations

Note: The results were cross-checked with ENTSO-E data, and when different from ERI, NRAs were asked separately to confirm either of the amounts. For Sweden, “Unspecified” refers to revenues placed on a separate internal account without further distinction of spending.

382 Not all the measures and data collection methods used to obtain the data mentioned earlier in the chapter have been unified among TSOs. This might cause slight discrepancies in comparisons between one country and another. Therefore, more and deeper cooperation is needed among all the involved parties (the Agency and CEER, NRAs, TSOs and ENTSO-E) in order to improve definitions and ways of collecting data, especially from TSOs, which have the core information. The Transparency Regulation²²⁵ should help to increase transparency with regard to remedial actions applied by the TSOs to ensure efficient cross-border trade.

225 Commission Regulation (EU) No 543/2013 of June 2013 on the submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council.

3.4 Conclusions and recommendations

- 383 In 2013, the efficient use of interconnectors continued to increase due to market coupling reaching a level of efficiency of 77% in the day-ahead timeframe. The highest 'losses in social welfare' are still observed on the Swiss borders, on the border between Great Britain and Ireland and within the CEE region, due to the lack of market coupling, among other factors. The losses due to inefficient day-ahead allocation methods illustrate the urgent need to finalise the implementation of the ETM.
- 384 The combined analysis of available intraday cross-border capacity and intraday price differentials shows that the available capacity in the intraday timeframe was frequently underutilised in 2013 (more than 40% of the times, the capacity remained unused in the economic direction)
- 385 In 2013, the exchange of balancing services across EU borders was still incipient. The analysis shows that substantial benefits (in the order of several hundred million euros per year) could be achieved from the exchange of balancing services, which is why Europe should continue to harmonise and integrate balancing markets.
- 386 UFs remain a significant challenge for the further integration of the IEM. Their persistence reduces tradable cross-border capacities, impacting market efficiency and network security. Welfare losses due to UFs have shown an increasing trend since 2011 and reached nearly half a billion euros in 2013, without taking into account the losses associated with the reliability margins, which are expected to increase the amount substantially. In view of integrating RES into EU power systems, there is an increasing need for flexible resources in the system. Flexibility in wholesale electricity markets (including RES balancing) requires efficient and well-integrated gas markets.
- 387 Overall, the monitoring results for the electricity wholesale section show that significant scope remains to improve: i) the use of existing cross-border capacity in the different timeframes (i.e. LT, DA, ID and BM); ii) TSO coordination on capacity calculations and allocation; and iii) configuration of bidding zones.

4 Wholesale gas markets and network access

4.1 Introduction

388 In competitive markets, retail and wholesale markets are closely interrelated. Liquid and efficient wholesale gas markets, in combination with transparent and non-discriminatory gas network access mechanisms, help promote competition and efficient price formation across the EU gas value chain.

389 The GTM²²⁶ and the provisions of the various gas network codes (NCs) and framework guidelines (FGs)²²⁷ aim to enhance EU gas wholesale markets' functionality, by improving their transparency and accessibility. The model is intended to encourage wholesale market liquidity by making hub trading easier and more transparent, and will ultimately constitute a mature and attractive mechanism as an alternative to traditional long-term bilateral contracts.

390 The measures proposed include the setting of criteria on the appropriate size of market zones²²⁸, the offering of cross-border bundled capacity from/to virtual trading points²²⁹ supported by trading platforms, the organisation of capacity auctions, harmonised transmission entry/exit tariff structures, market-based balancing mechanisms²³⁰ and, possibly, following a cost-benefit analysis, the merging of market zones²³¹. At the same time, the EU Infrastructure Package²³² is contributing to the establishment of integrated wholesale markets by encouraging the development of adequate cross-border transmission infrastructure. In addition, and in order to mitigate the lack of transparency in wholesale markets, Regulation (EC) No 1227/2011 on wholesale energy market integrity and transparency (REMIT²³³) is intended to prohibit insider trading and market abuse in gas wholesale markets across Europe through the establishment of a monitoring regime for wholesale energy trading.

391 This chapter provides a review of the main wholesale market developments in 2013 across the EU. It presents the key demand, price and gas supply developments (Section 4.2), then explores the level of market integration assessed through the evolution of price, competition and liquidity indicators (Section 4.3). This section also contains an assessment of the welfare losses that each individual

226 The GTM is an EU wholesale market model essentially promoting a hub-to-hub trading framework. The GTM is currently under review to assess whether enhancements are required to address some new challenges which have arisen in the gas sector.

227 The Commission Decision of 24 August 2012 amending Annex I to Regulation (EC) No 715/2009 on Congestion Management Procedures, the Commission Regulation (EU) No 984/2013 of 14 October 2013 establishing a Network Code on Capacity Allocation Mechanisms in Gas Transmission Systems and the Commission Regulation (EU) No 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks are already in place. The Network Code on Interoperability and Data Exchange Rules and the Network Code on Harmonised Transmission Tariffs Structures are currently under development.

228 The GTM1, published on December 2011, provided an initial vision of the European gas market and the necessary measures to foster IEM completion. See: http://www.ceer.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/GAS/Gas_Target_Model/CD/C11-GWG-82-03_GTM%20vision_Final.pdf. GTM1 market zones dimension criteria were: churn rate over 8; markets zone sizes over 20bcm; more than 3 supply source origins; HHI index, measuring concentration, over 2,000; and Residual Supply Index (RSI), measuring the share of consumption that can be met without the largest supplier based on supply capability higher than 110%. GTM2 will provide a revision of the initial model, with the aim of ensuring the GTM remains fit for purpose. GTM2 works are being conducted during 2014. GTM2 may set new criteria in relation to ask-bid spreads, the number of players or number of available offers in a given timeframe.

229 A virtual trading point consists of an entry/exit system where gas can be traded independently of its location. A virtual trading point offers users the possibility to bilaterally transfer the title of gas and/or swap imbalances between network users – processes facilitated by exchanges or balancing platforms.

230 Arguably, balancing market operations have more impact on short-term liquidity enlargement, but they help to constitute a price reference base, and this may also serve to spread liquidity to forward products.

231 See: GTM presentation on the current status of merging projects: <http://www.acer.europa.eu/Media/Events/3rd-Gas-Target-Model-Stakeholders-Workshop/Documents/08.%20Hesseling%20Market%20integration%20projects.pdf>.

232 See: Regulation (EU) No 347/2013 on guidelines for trans-European energy infrastructure. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:115:0039:0075:EN:PDF>.

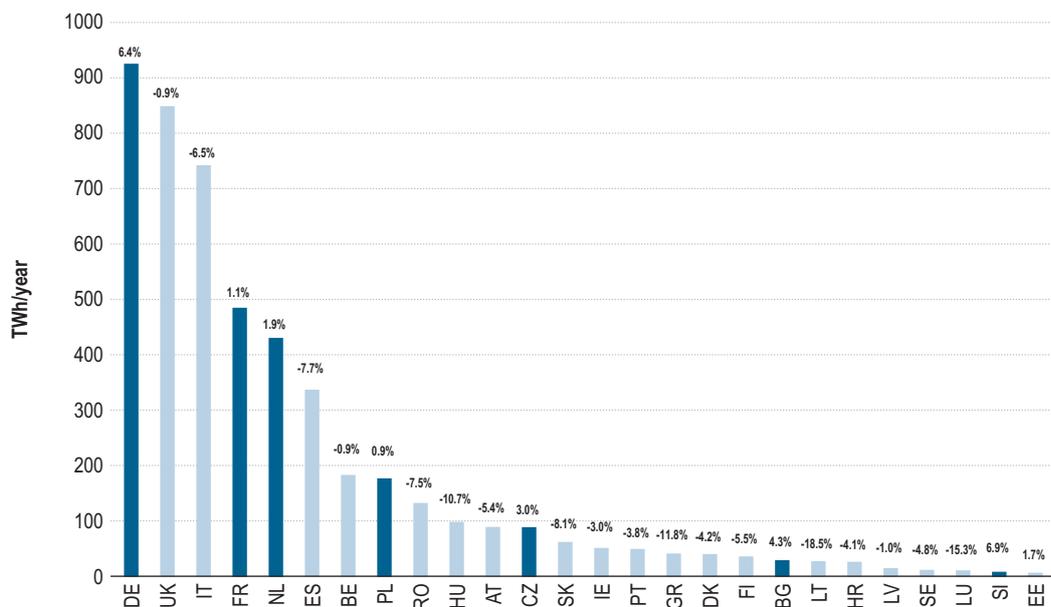
233 See: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011R1227>.

MS is estimated to be facing pending the completion of a fully integrated EU internal gas market. Further, network access issues such as cross-border capacity utilisation, gas flows and transmission tariffs are tackled (Section 4.4) and, finally, the main barriers inhibiting further EU wholesale market integration are summarised, and mechanisms to remove them considered (Section 4.5).

4.2 Developments

392 EU-26 natural gas consumption totalled roughly 5,000 TWh in 2013, a slight decrease compared to 2012. The same factors that significantly reduced gas demand in previous years²³⁴ – slow economic growth, the increased use of coal as the fuel of choice for power generation, the increasing penetration of RES and energy efficiency improvements – continue to be determining factors. This overall EU trend varied among MSs, as shown in Figure 67.

Figure 67: EU-26 gas consumption – 2013 (TWh/year and % variation with respect to 2012)



Source: Eurostat’s gross annual inland consumption monthly data (Data series nrg_ind_103m in TJ (GCV), 8 May 2014) and ACER calculations

Note: Denmark, France, Germany, Lithuania and Luxembourg values were revised by NRAs. Those MSs, where demand increased in 2013 compared to 2012, are shown in dark blue. Cyprus and Malta have no gas market.

234 EU-26 gas demand decreased year-on year by 1.2% in 2013, 2.2% in 2012 and 10.5% in 2011.

- 393 One of the main reasons for the overall reduction in EU gas demand is the displacement of gas by other energy sources for power generation²³⁵. This has been driven by two factors: first, the availability of cheap international²³⁶ coal imports in combination with the low price of CO₂ Emission Trading System (ETS) allowances²³⁷, causing gas to remain less profitable than coal-fired generation during the year, leading to negative spark/dark²³⁸ spreads. Second, as a result of lower generation costs and direct support schemes²³⁹, electricity production from RES is increasing across the EU, in parallel with steps taken to meet the 20-20-20 targets. In addition, gas demand for industry was affected by a slight decrease in EU industrial production²⁴⁰. Colder weather conditions, on the other hand, particularly in the first quarter of the year, sustained household consumption. The impact of each of these factors on demand varies between MSs²⁴¹.
- 394 EU gas wholesale prices remain over twice as high than US prices, while Asian and Latin American LNG markets still sustain price levels which considerably exceed those of the EU. In the US, shale gas production and greater wholesale market competition continued to place downward pressure on domestic prices²⁴². Higher EU energy prices relative to the US and other world regions affect industrial competitiveness and are reducing the EU's share of energy-intensive goods in global exports²⁴³.

235 Gas consumption for electricity generation declined by 30% in Spain, 20% in France, 16% in Italy, and 8% in the United Kingdom compared to 2012. Sources: Enagas, GRTgaz, Snam and National Grid.

236 Cheap shale gas availability in the US has led to coal exports from this country. Additionally, the economic contraction in developing economies (highly dependent on coal) has led to an increase in global coal market liquidity resulting in lower coal prices. See Figure 39.

237 See underlying info on the ETS schemes and price evolution here: http://ec.europa.eu/clima/policies/ets/index_en.htm.

238 The spark spread is the gross margin of a gas-fired power plant from selling a unit of electricity, having bought the fuel required to produce this unit of electricity. The dark spread is the similar gross margin of a coal-fired power plant.

239 Support schemes differ across EU MSs. In certain markets, RES may be competitive without them. See: Annex 9.

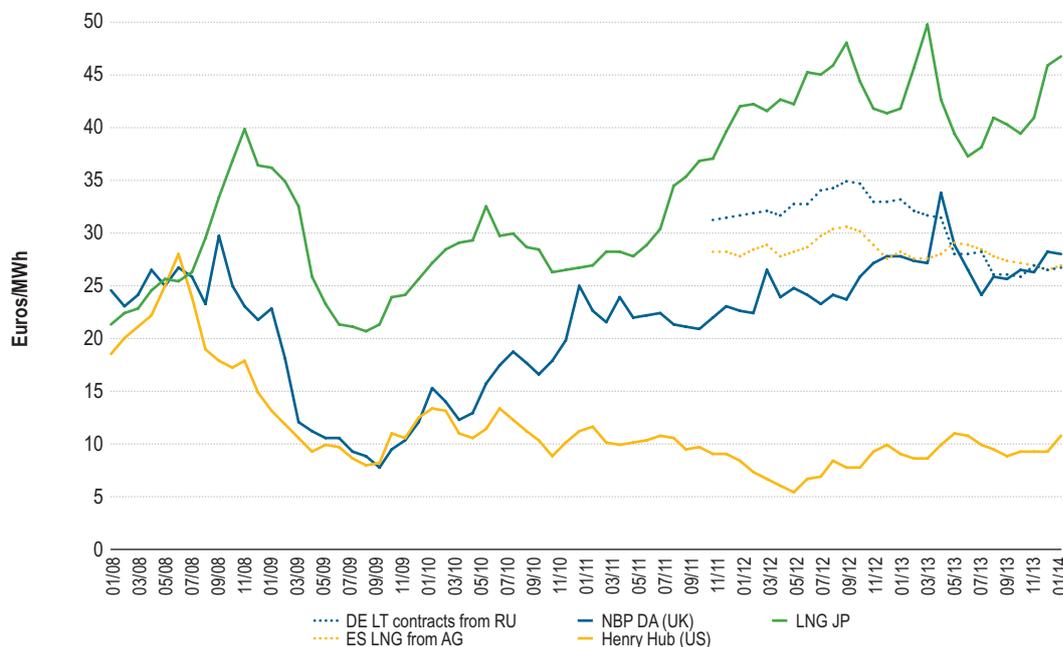
240 See: http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/4-12022014-AP/EN/4-12022014-AP-EN.PDF.

241 See, for example: Eurogas Statistical Report 2013: http://www.eurogas.org/uploads/media/Eurogas_Statistical_Report_2013.pdf.

242 See, for example: http://www.oxfordenergy.org/wpcms/wp-content/uploads/2011/12/NG_58.pdf.

243 According to the IEA, EU28 energy intensive goods exports could decline by one-third from the current share until 2035. See: <http://www.worldenergyoutlook.org/publications/weo-2013/>.

Figure 68: International wholesale price evolution – 2008–2014 (euros/MWh)



Source: Platts, Thomson Reuters, ICIS Heren (2014) and ACER calculations

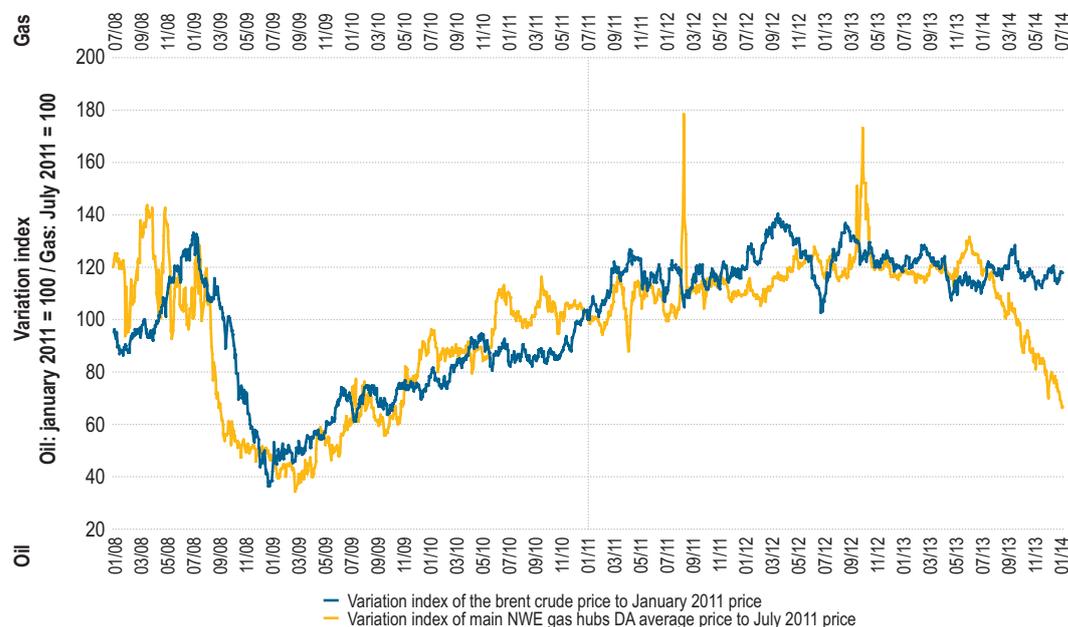
395 Compared to 2012, greater wholesale gas price convergence was observed across EU MSs in 2013, although considerable price differences still persist between certain markets. The convergence was assisted by the continued alignment of EU hubs’ prices, and by the convergence of hub prices and the prices of long-term contracts (LTC) indexed to other commodities. On average, approximately half²⁴⁴ of EU gas supplies are still linked to long-term oil-indexed contracts, although the tendency is increasingly for these contracts to be renegotiated or indexed to hub prices. This topic will be covered in more detail in Section 4.3.2.

396 Oil prices in 2013 generally remained the same as in 2012. Although the correlation²⁴⁵ between the price variations of oil and gas is growing weaker as gas-on-gas competition rises, oil prices still seem to have been one of the main determinants of overall wholesale gas prices in Europe in 2013. This was a result of the continued direct oil-indexation of gas prices in a significant proportion of European supply contracts, and the impact those contracts would have as references for hub price formation. The data points to a divergence in correlation between gas and oil prices from the beginning of 2014, with gas prices showing a significant reduction in contrast to oil prices, which remained relatively stable. Downward price pressure specific to gas may have been a result of relatively mild weather conditions and high EU gas storage stocks, contributing to relatively benign supply conditions.

244 This overall value varies by region, with North-West Europe having the largest shares of indexation to hub prices and SEE and Mediterranean MSs the lowest. See International Gas Union Gas Wholesale prices Survey 2014 for regional values split: http://www.igu.org/sites/default/files/node-page-field_file/IGU%20Wholesale%20Gas%20Price%20Survey%20Report%20-%202014%20Edition.pdf.

245 It should be pointed out that correlation does not mean causation.

Figure 69: Oil and gas hubs price evolution in Europe – 2008–2014 (index)



Sources: Platts (2014) and ACER calculations

Note: A six-month forward lag is used for gas in the comparison with oil prices. The gas price index variation is calculated with reference to average hub gas prices on 1 July 2011 (on the upper X axis). The oil price variation is calculated with reference to the oil price on 1 January 2011 (on the lower X axis). This is because hub prices are predominantly influenced by oil-indexed contracts, the prices of which track oil with a lag of six to nine months.

- 397 As happened in 2012, in 2013 EU indigenous gas production continued to decline²⁴⁶ while EU gas imports continued to increase. This trend continues to heighten the debate on shale gas extraction in Europe. At the moment, the views on the pros and cons of shale gas extraction differ among MSs. The European Commission published a Recommendation²⁴⁷ aiming to clarify the conditions under which fracking can take place, while imposing no ban on them. In addition to shale gas, it is possible that biogas and power-to-gas technologies could also offer areas of growth for European gas supply in the future, although the scalability of these technologies is still unclear.
- 398 The share of Russian exports to the EU showed a significant increase compared to 2012²⁴⁸. This recovery is partly explained²⁴⁹ by Gazprom renegotiating final offered contract prices with the aim of better utilising spare production capacity. This may have been in response to its loss of market share to more flexible competitors – i.e. Norway – in previous years, or in anticipation of the price reduction effects from increased competition due to the further development of organised markets and new interconnection infrastructure availability. The need to replenish EU gas storage stocks after the low stock levels reached at the end of March 2013 is also likely to have impacted demand for Russian gas. Another noticeable change compared to 2012 was the decline, by one third, in EU LNG imports, probably caused by higher Asian and Latin American prices. These analyses will be expanded in Section 4.4.1.

246 Indigenous production declined by 2.4%, source Cedigaz 2014. EU net gas imports in 2013 were worth approx. 130 billion euros.

247 See: http://ec.europa.eu/environment/integration/energy/unconventional_en.htm.

248 Aggregated Russian exports to Europe increased in 2013 by 15%, to roughly 155 bcm. Source: IEA. See Figure 80.

249 These and other market trends explained/referred to throughout the document confirm the Agency and CEER view on the basis of specialised media reports, different forum presentations and expert views. Additional reasoning on price downward pressure is presented in Section 4.3.2. Flow increase interpretations are continued in Section 4.4.1.

4.3 Markets' integration

4.3.1 Level of integration: liquidity evolution

- 399 Liquidity has a strong bearing on the level of competition and the efficiency of price formation in gas wholesale markets. The number and diversity of gas wholesale market participants, and the volume of wholesale gas trades at gas trading hubs are important liquidity indicators. Competitive hubs attract contending market participants and provide more options to source and hedge supplies. This places downward pressure on gas prices, which should translate into benefits for retail markets.
- 400 A series of factors are detrimental to liquidity and competition. These factors²⁵⁰ include: the absence of hubs, high market concentration, insufficient interconnection capacity, capacity hoarding, the presence of vertically integrated incumbents and oligopolistic market structures which limit the trading of gas. Furthermore, the difficulty in obtaining trading licenses and high entry costs may particularly hinder the entry of small players, who are less able to achieve economies of scale.
- 401 Figure 70 shows the level of diversity of supply by country of origin across the EU. The figure shows that ten MSs rely on a single country of origin for more than 75% of their supply, meaning that a single source²⁵¹ is able to exert considerable influence on wholesale prices in these markets. These MSs often lack adequate interconnection capacity, do not have competitive hubs and have no access to LNG supply. Consequently, these MSs tend to face higher gas prices²⁵² than MSs with enhanced interconnections, LNG²⁵³ terminals and liquid hubs, further demonstrating the need for more EU market integration.

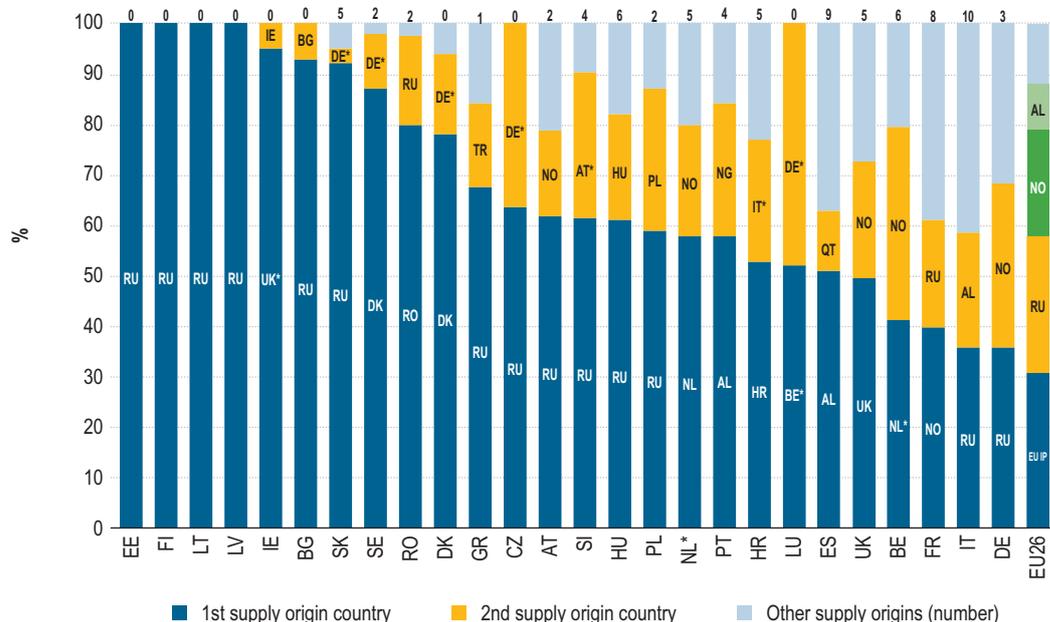
250 Factors are presented here as a theoretical list based on factual impacts observed in individual markets.

251 Arguably, several suppliers could be sourcing from the same country of origin and competing among themselves. Also, the situation may be quite different depending on whether the single source is the home country, an EU MS or Energy Community Contracting Party, or a third country.

252 See also Figure 73 showing EU-26 wholesale prices in correlation to MSs market concentration levels. For Denmark and Romania, the high single source dependency relies on the fact that a relevant share of total country consumption is met by indigenous production. Ireland, despite its high dependency on a single source, has similar prices to NWE MSs due to the competitiveness of the country's declared gas import contract prices.

253 Some LNG sources may only arrive in small quantities and/or at significant price premiums, but 'count' as a separate supply source.

Figure 70: Estimated diversity of gas supply in EU-26 per MSs and by origin of supply country – 2013 (%)



Source: Eurostat Comext, BP Statistical Report, Eurogas, MSs' National Reports (2014) and ACER calculations

Note: Supply origins indicate the upstream gas producer state or, in those origins marked with an asterisk, a MS featuring an organised market where gas has been purchased. The number at the top of the column relates to the total number of other different MSs declared as gas import origins in Eurostat Comext; again, either a gas-producing MS or MS with a gas market where gas has been purchased. The Netherlands split refers to the gas origins of overall traded volumes in the country, but the country constitutes itself as a net exporter even by solely considering its relevant indigenous production.

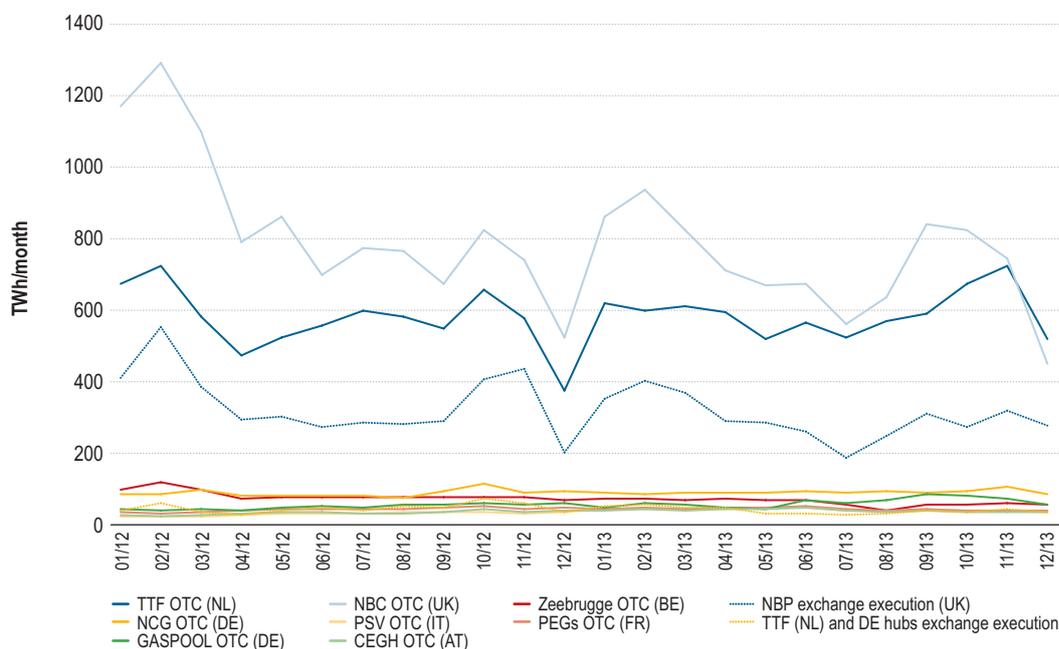
402 Figure 71 compares traded gas volumes at the main NWE EU hubs. It demonstrates that aggregated hub liquidity levels changed little in 2013: the continuing tendency to move away from oil-indexations in long-term contracts and to hedge short-term exposure on the hub has brought increased liquidity to some hubs, as did the establishment of hub-price components in certain MSs' regulated prices²⁵⁴. However, progressive reductions have been observed in the gap between hub prices and the price of long-term contracts, which may be reducing the profitability of pure hub sourcing activity in comparison to previous years²⁵⁵. In addition, the continued effect of slow economic growth, and particularly the lack of credit, has forced some financial entities and companies to reduce their financial exposure to gas markets. This could have reduced traded volumes at some hubs, particularly of longer-term products²⁵⁶.

254 Belgium, France, Hungary and Italy (only for vulnerable customers) have introduced such regulatory provisions.

255 In addition, in certain long-term renegotiated contracts, clauses may have been imposed that reduce arbitrage flexibilities against the hub.

256 This is particularly valid for the NBP. Difficulties in obtaining products longer than the year-ahead product (longest curve) made the hubs less liquid. On EU-hubs, major volumes are typically negotiated on intra-month and month-ahead products. See Wagner, Eibling & Company forthcoming study on gas market functioning for an appraisal of the split of liquidity and products duration: <http://www.acer.europa.eu/Media/Events/3rd-Gas-Target-Model-Stakeholders-Workshop/Documents/04.%20Wagner%20WEC%20-%20Functioning%20of%20Gas%20Markets%20-%20Albrecht%20WAGNER%20140515.pdf>.

Figure 71: Traded volumes at main EU hubs – 2012–2013 (TWh/Month)



Source: ICIS Heren, Trayport (2014)

Note: Over-the-counter trade (OTC) refers to the volumes traded among parties without the supervision, credit risk management and clearing function of an exchange operator. Exchange execution refers to those volumes supervised and cleared by an organised market operator.

403 Total traded volumes at the main NWE EU hubs²⁵⁷ ranged between four and five times the overall EU-26 physical gas consumption. OTC trade – bilateral plus broker cleared – remained the predominant²⁵⁸ type of trading, especially on the Continent, where it accounted for more than 90%²⁵⁹ of traded volumes. NBP and TTF continue to have the highest traded gas volumes, and generally remain the most liquid and competitive²⁶⁰ European hubs. Although the traded volumes at both these hubs declined at the end of 2013 (in part a seasonal effect), the high liquidity of these two hubs²⁶¹ – particularly for longer-term products – means that their prices act as a reference for other hubs in the EU and other gas contracts.

257 Hubs considered: NBP (UK), TTF (NL), GASPOOL and NCG (DE), Zeebrugge (BE), PEG Nord (FR), CEGH (AT), PSV (IT).

258 Among other factors, OTC volumes' predominance over exchange cleared (organised markets) can be explained by the trust-based and relatively circumscribed trader community, by larger firms' presence (as arguably more capable of backing their credit positions) and by the option of customising products vs. exchange market standardisation. Arguably another factor in OTC predominance relies on the opportunity to price discriminate across buyers. Moreover, the clearing fees and guarantees imposed by organised markets with a central counter-party may constitute added costs. However, data indicate that to some extent OTC trades are being progressively replaced by exchange clearing to better address counterparty risks, particularly for longer-term products. Organised markets prices in those liquid and low concentrated hubs, although representing smaller traded volumes than OTC, can be considered transparent and accessible price signals to be used as a market reference that usually matches OTC prices.

259 This percentage represents OTC aggregated traded volumes for all products. OTC and exchange executed traded volumes ratios may slightly differ per type of contract product, showing day-ahead exchange executed products have the relative higher shares. In UK NBP, exchange executed trades comprise more than 30% of overall traded volumes.

260 With the highest churn ratios (more than 10), the highest number of participants (more than 100) and the highest available number of offers at any given period. TTF is becoming an equally influential hub as NBP. Both hubs' liquidity levels are now comparable, given the increase in TTF liquidity registered in 2013 and the aggregate decline in NBP traded volumes. See also Section 4.4.1.

261 Liquidity values on the curve on these two hubs are promoted by the 'circle of virtuosity' factor; liquidity attracts liquidity as sourcing and hedging trades from adjacent areas. A relevant effect for liquidity is that these two hubs show the EU narrowest average bid-ask spreads in gas traded products. They are also favoured by the indigenous production factor in both MSs.

- 404 Across a number of markets, including Germany, Belgium, France, Austria and Italy, a trend has developed in favour of shorter-term gas contracting²⁶², additional to the balancing portfolio operations. This is likely to increase the number of gas trades and the liquidity of these markets' hubs, as participants seek to derive economic value from short-term price arbitrage. The higher reliance on hubs for gas contracting is progressively impacting capacity contract trends in those markets. Shorter-term capacity contracts are increasing²⁶³, as they offer a more flexible way of matching commodity demand.
- 405 Facilitated by NRAs²⁶⁴, the development of settled gas exchanges and newly implemented VTP configurations has also increased hub trading in several Central-East European countries, such as the Czech Republic, Hungary, Poland and Slovakia. Shippers in these countries are also relying more on adjacent organised markets, in Germany and Austria in particular, which is also improving competition²⁶⁵. Despite this, both in terms of number of supply sources and volume of trades, only a minority of MSs (mainly in North-West Europe) have wholesale gas markets with a high degree of liquidity. Furthermore, direct bilateral contracts with upstream producers remain the most common supply mechanism across most MSs in the EU.

4.3.2 Level of integration: price convergence²⁶⁶

- 406 Price convergence between EU gas wholesale markets is an important indicator of the level of market integration: in fully integrated markets, higher prices in one area should attract gas supplies from lower priced areas, thus reducing price differentials.
- 407 In aggregate, increased gas wholesale price convergence was observed across the EU in 2013 (see Figure 72). One of the main reasons for this was that the trend towards the renegotiation of long-term contract conditions, initiated in previous years, was amplified in 2013. During such renegotiations, hub prices have been increasingly used as a reference, and traditional price indexations to oil and other commodities have been reduced. Where modifications to the indexations were not made, in some cases, direct discounts were granted by upstream producers²⁶⁷. This arbitration tendency has contributed to greater wholesale price convergence among EU MSs, predominantly placing downward pressure on prices.

262 See, for example, NCG registry of traded volumes and products: http://datenservice.net-connect-germany.de/BoerslicherGashandel.aspx?MandantId=Mandant_Ncg&rdeLocaleAttr=en.

263 See data analysis in Section 4.4.1.

264 See, for example: <http://www.reuters.com/article/2013/12/05/poland-gas-idUSL5N0JJ2BR20131205>.

265 See, for example, data supporting this statement on the ICIS Heren European Gas Hubs Report 2013.

266 The trends in overall pricing and contractual conditions mentioned in this Section conform the view of the Agency and CEER on the basis of specialised media reports, different forum presentations and experts views.

267 See: KEMA study for the European Commission on LT-ST contracts in gas: http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/lt-st_final_report_06092013final.pdf.

- 408 The increase of this arbitration tendency in 2013 derives in large part from the fact that Gazprom²⁶⁸, and in Southern Europe Sonatrach²⁶⁹, increasingly adopted this approach as a competitive response to earlier movements by Norwegian and Dutch producers, but also with a view to utilising their vacant production capacities in a context of lower demand. The downward pressure on Russian gas prices has also come from increases in competition in some Central-East markets, the further development of organised markets within the EU, and the delivery and planned expansion of new interconnection infrastructure²⁷⁰.
- 409 However, despite increased contract renegotiations and greater NWE price convergence, significant price variations remain across the EU as a whole, reflecting the different degrees of bargaining power in different markets. The extent to which this is the case is mainly related to overall liquidity and competition levels along the whole gas value chain.
- 410 There is some evidence that Central-East and Southern European MSs tend to sustain a premium over more liquid, less concentrated and better interconnected Western countries. Oil-indexed and semi oil-indexed long-term contract prices also remain more common in Central-East and Southern Europe, and in 2013 the price of these contracts continued to be higher than hub spot prices, even though the gap has narrowed compared to previous years²⁷¹. LNG import prices tend to be price competitive on average, providing benefits to those markets with access to LNG, although in some cases the price of LNG in Asian and Latin American markets led to that same gas subsequently being re-exported from the EU.
- 411 As hub spot prices are more exposed to EU gas supply and demand fundamentals, their volatility²⁷² is also higher. This can be observed in Figure 72, where the peak hub prices for March correspond to the spike in demand during the unexpectedly cold temperatures in northern Europe that month²⁷³. In such cases, hub prices may surpass the prices of gas contracts indexed to other commodities. For this reason, to spread their pricing risks, major shippers or large industrial consumers may retain, at reduced volumes, a portfolio of LT contracts indexed to other commodities.

268 Specialised reports (ICIS Heren, Platts) indicate that price reductions of more than 15% have been granted to Poland and Bulgaria. Gazprom seems to have a strategy of treating markets separately and thus establishing some price discrimination between MSs, arguably influenced by political considerations.

269 According to specialised reports, Sonatrach is still keen to maintain oil indexations in its existing LT contracts, but it is recently showing more flexibility on take-or-pay volumes obligations. Also, some hub indexation is being offered in LNG deliveries. See a detailed analysis on the subject in: <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2011/03/NG48.pdf>.

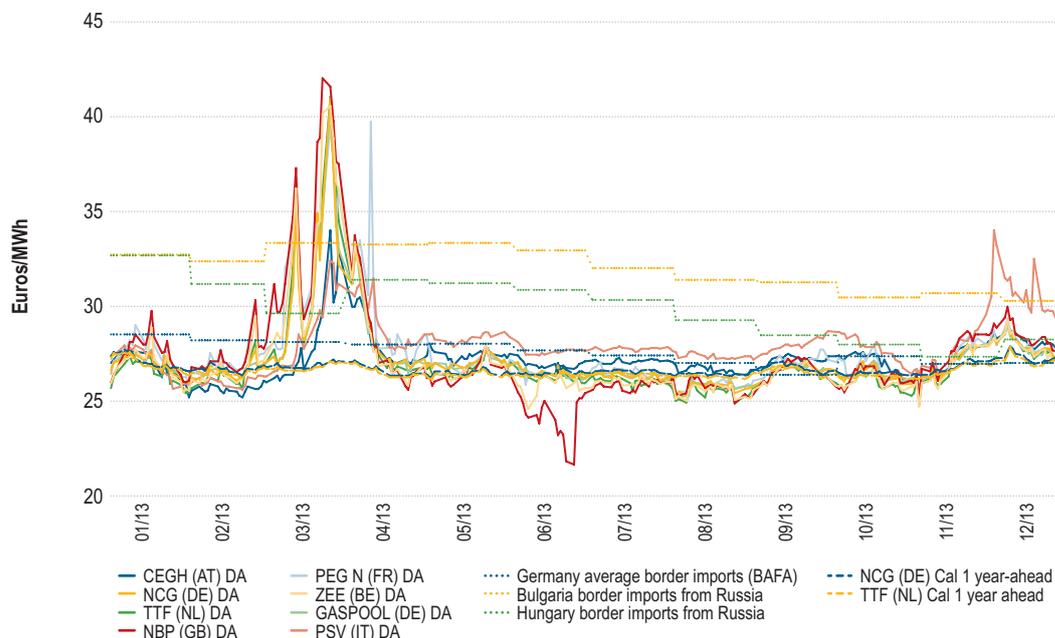
270 The efforts to promote diversification of supplies and the potential threat of competition from LNG and unconventional gas production are also playing a role. Lower aggregated EU gas demand is also a relevant factor. The international context also adds downward pressure on global prices, such as the possibility of forthcoming US or Australian LNG exports, the slow-down in China's economy or the indication that Japan may restart nuclear power stations.

271 See Figure 72 and Figure 73. In some MSs, the trend is now to correlate regulated prices to hub prices. By this procedure, the historical indexations of the regulated tariff to main LT contracts are progressively substituted by hubs' price references. In Italy, for example, AEEG ruled that Italian gas prices had to be linked to Dutch hub TTF from October 2013.

272 Arguably volatility is more reflected in total hub contracted volumes.

273 As another example of this volatility, in June, UK NBP prices were reduced due to a combination of factors: low demand, high imports from Norway – as Norwegian flows were diverted to the UK due to maintenance on the interconnector flowing Norwegian gas to Germany – and coincidence in time with the annual maintenance works of the Interconnector, a fact which impeded gas flows from the UK to Continental Europe.

Figure 72: Gas prices: comparison between main EU hubs and cross-border import prices – 2013 (euros/MWh)



Source: Platts, Eurostat Comext, BAFA (2014)

Note: BAFA provides an estimate of overall German cross-border gas imports prices. BAFA convergence to hubs' prices illustrates a reduction in lasting bilateral LT oil-indexed prices and the progressive indexation of German import contracts to hub price indexes.

412 As indicated above, the price correlation among major NWE hubs is quite significant; however, this may not necessarily mean that wholesale markets are wholly integrated. Price spreads may still arise as a result of differences in liquidity degrees, concentration levels, transmission tariff values, capacity constraints, congestion levels and individual MSs demand-supply fundamentals and existing contract portfolios. Under particular circumstances, the combination of these factors may have resulted in weaker correlations during some 2013 periods; for example, PSV still maintains a certain premium over NWE hubs, although it is lower than in previous years. Except for winter months with peak spot prices, one year forward product prices were mostly slightly above spot ones, perhaps reflecting the expectation²⁷⁴ of price increases for the coming months.

4.3.3 Benefits of market integration

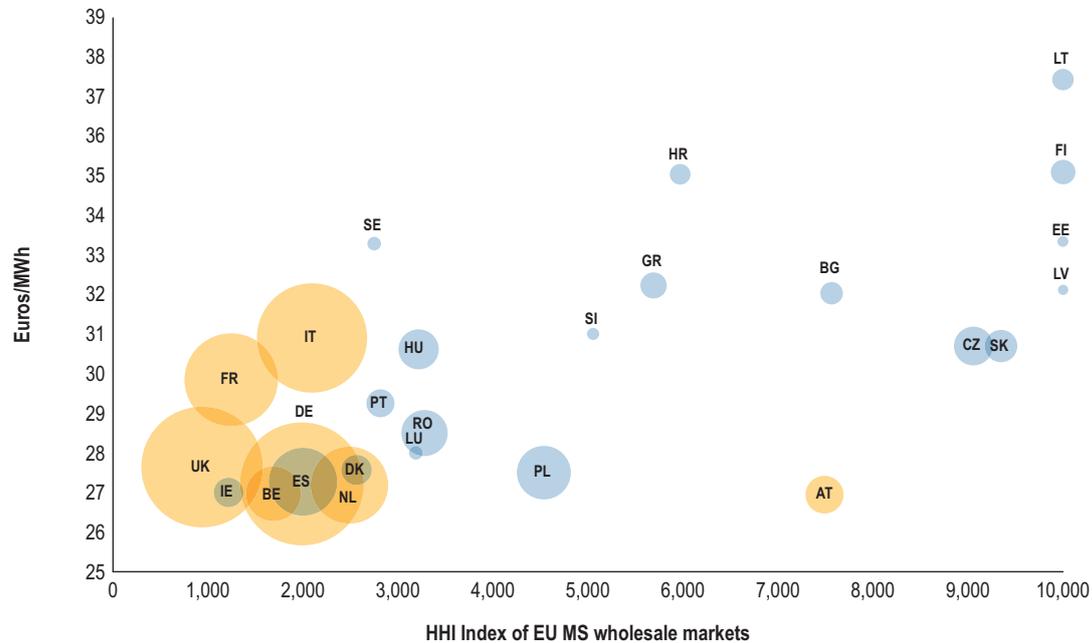
- 413 As indicated above, despite increasing convergence in 2013, significant wholesale price²⁷⁵ variation still exists across Europe, reflecting varying market fundamentals and varying degrees of competition along the gas value chain.
- 414 The data presented in Figure 73²⁷⁶ below shows a positive relationship between market concentration²⁷⁷ and prices: in general, less concentrated markets tend to have lower prices. The relationship is not so strong as to demonstrate that market concentration is the only price determinant, but the data do not take into account structural differences (which may make supplying gas more expensive in one country than another), and methodological issues may under-represent the trend in some cases (see notes for Figure 73).
- 415 Nevertheless, considered together with the other data and analyses presented in this chapter, Figure 73 suggests that it is plausible that more benefits in terms of lower gas wholesale prices can be derived from the further integration of EU wholesale markets. As Figure 73 also demonstrates, larger markets may offer some specific suppliers the opportunity to benefit from greater economies of scale when exerting bargaining power on producers, thus leading to lower prices formation in certain larger MSs. Therefore, closer alignments of smaller markets with larger markets may also deliver benefits. The sub-sections which follow explore the materiality of some of these benefits in terms of welfare losses/gains.

275 The prices used in the overall subsection constitute an estimate of the average price level for each MS based on available data and the application of ACER/CEER methodology. See Figure 73 Notes.

276 Figure 73 provides an interesting comparison with the diversity of supply sources data represented in Figure 70. Certain MSs may not fully accomplish the general signalled correlation, given their specific market fundamentals (i.e. Austria, Italy, Poland or Sweden).

277 Herfindahl–Hirschman Index (HHI) values are calculated on the basis of the market shares of all different upstream companies sourcing gas into the MS, not by the shares of the wholesalers/importers i.e. players buying this gas.

Figure 73: Gas wholesale prices in EU MSs compared with market concentration and gas demand – 2013 (euros/MWh)



Source: Eurostat, Comext, Platts, Frontier, and NRAs data (2014) and ACER calculations

Note: Circle sizes are proportionate to MSs gas demand. Those in orange denote MSs with more liquid organised markets. The prices used constitute an estimate of the average price level for each MS based on available data. Final prices may vary between suppliers and over time, depending on specific contracts and individual procurement strategies. The presented prices result from the application of the ACER/CEER MMR 2013 methodology²⁷⁸: in cases of an MS with no hub or a hub with very reduced liquidity, wholesale prices are solely referenced from the Eurostat Comext Database on declared gas import prices at the border weighted by import-origin volumes; in MSs with hubs but relatively illiquid forward products, a combination of long-term contracts prices (assessed from Eurostat Comext Database) plus short-term hub products prices was used; in MSs with sufficiently liquid hubs, the assessment is based exclusively on hub price references and hedging strategies around the hub. Monthly prices were weighted by monthly demand to arrive at a unique final yearly average price. It is to be noted that the methodology used has limitations that may result in inaccuracies for certain MSs. Nevertheless, it is consistently applied for comparability reasons. For example, the hub prices in France and Italy are reasonably correlated with the prices of other main European hubs like TTF and NCG (see Figure 72) but the methodology used may not fully reflect the realities or specificities of the French and Italian wholesale markets. The resulting higher final average prices in these two MSs can be explained by the higher prices of declared gas imports at the French and Italian borders derived from the Eurostat Comext Database. For instance, the wholesale market price for PEG Nord on the French gas exchange was on average 27.60 euros/MWh in 2013, and the wholesale market price for PSV on the Italian gas exchange was on average 27.98 euros/MWh. The Romanian price used is the Eurostat Comext one on border imports; the indigenous production price is estimated to be 30% lower. In the absence of Eurostat Comext data, the Polish wholesale price corresponds to the regulated industrial consumers' tariff – group E with the lowest tariff – net of transmission charges indicated by the NRA. The HHI values are calculated on the basis of market shares of different upstream companies sourcing gas into the MSs.

a) Estimates of gross welfare losses

- 416 This section assesses prospective gross welfare losses across the EU – losses resulting from the limited integration of national gas markets –by contrasting the estimated price deviations of EU MSs gas wholesale markets with the baseline reference price of the Netherlands²⁷⁹ (Dutch market price built on TTF). This provides an estimate of the potential savings that could be achieved if all wholesale markets in the EU had at least similar liquidity and competition levels, and hence comparable prices as the TTF²⁸⁰. This initial exercise does not take into account demand-supply constraints or other factors such as transportation costs, necessary investment costs or importing capacity availability²⁸¹, all factors that could affect the potential level of price convergence.
- 417 On an EU aggregated basis, the total potential annual gas wholesale gross welfare losses due to the current lack of market integration amounted to 7 billion euros in 2013. Losses have decreased significantly in comparison to 2012, when they totalled 11 billion euros. This decrease is mainly the result of the continued wholesale price convergence among MSs observed in 2013, the reasons for which were examined in Section 4.3.2: mainly due to LT contract price renegotiations, prompted by the enhanced competitive pressure facilitated by hub developments and increased interconnection capacity.
- 418 On a country-by-country basis, the highest aggregated potential losses were observed in Italy and France²⁸², an effect accentuated by the significant gas demands in these two MSs. The appraised wholesale market prices in these two MSs remain above the reference price of the Netherlands. This is likely to be driven by the fact that their supplies are, relative to the Netherlands, still more reliant on higher-priced existing long-term contracts²⁸³, and because their hubs continue to show lower forward product liquidity²⁸⁴. Overall, the gross welfare loss in Italy's case amounts to approximately 2.8 billion euros and in France 1.2 billion euros.
- 419 Figure 74 shows the relative wholesale gross welfare losses in each MS per individual household consumer. For comparability purposes, calculations for all MSs were made using the EU average household consumption level. The results point towards potential significant welfare losses remaining in several MSs, although the precise values would be affected by individual consumers' consumption levels²⁸⁵.

279 Yearly gross welfare losses are thus calculated as the aggregated sum of the assessed price differentials between EU MSs and the Netherlands monthly prices, multiplied by the monthly demand of each MS.

280 The formation of similar final prices to TTF in all EU MSs is not guaranteed in the presence of comparable competition and liquidity values as the Netherlands. Different MSs' market fundamentals would play a specific role in the setting of final gas prices.

281 Some of these factors are analysed in the next section.

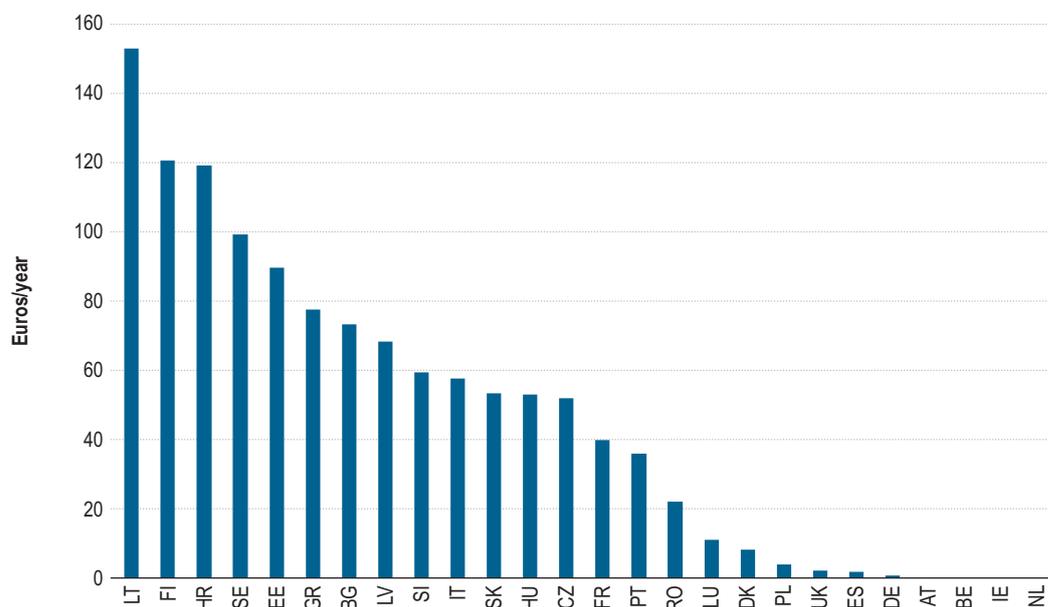
282 See the notes to Figure 73 explaining the limitations on estimates of wholesale prices in France and Italy.

283 Eurostat Comext data used in the price assessment refer to the gas import prices declared at the borders, based on information collected by customs agencies; they are deemed to be more representative of longer-term contracts.

284 Hub prices in both France and Italy (PEGs, PSV) are relatively convergent with TTF ones, but liquidity, particularly for longer curve products, is not so ample. According to specialised reports (ICIS Heren), during 2013 GDF and ENI obtained more hubs indexations and price discounts in their historical long-term contracts by increasing negotiations with upstream suppliers.

285 The EU average household consumption level considered is 15,000 kWh/year. This amount was calculated using EU MSs average from CEER National Indicators database. Significant consumption level differences may exist among MSs household consumers, a fact which would impact their precise welfare losses values.

Figure 74: Wholesale level of gross welfare losses per EU average household consumer in EU-26 – 2013 (euros/year)



Source: Eurostat Comext, Platts, NRAs, CEER Database Indicators data (2014) and ACER calculations

b) Net welfare gains estimations

420 Building on the gross welfare loss results, this section assesses potential net welfare gains across Europe by examining one of the several mechanisms that could serve to increase price convergence among EU MSs: the optimisation of existing capacities²⁸⁶. The scenario assumes that competitive firms would expand their sales to adjacent markets by using unused physical²⁸⁷ capacities on existing cross-border interconnections (assessed as the IPs total technical capacity minus the physical registered flows during the year). These new entrants would undercut previous wholesale prices in entry markets, thus generating welfare gains.

421 This section also looks at the impact that new interconnection infrastructures could have on the reduction of supply constraints and the facilitation of new market entrants. However, given the complexity of the issue, no numerical analyses are presented on this particular aspect²⁸⁸.

286 The Agency and CEER are aware that this scenario builds on a theoretical situation similar to the market coupling and implicit capacity allocation schemes referred to in the Electricity chapter. However, the physics of gas systems, the lack of liquid organised markets, contractual capacity issues, lack of trading counterparts, contractual obligations, gas resale restrictions, shippers' market strategies and other factors may in reality make optimisation of IPs capacities more difficult. The exercise aims to constitute a referential analysis which could be closer to reality in the future as IEM develops.

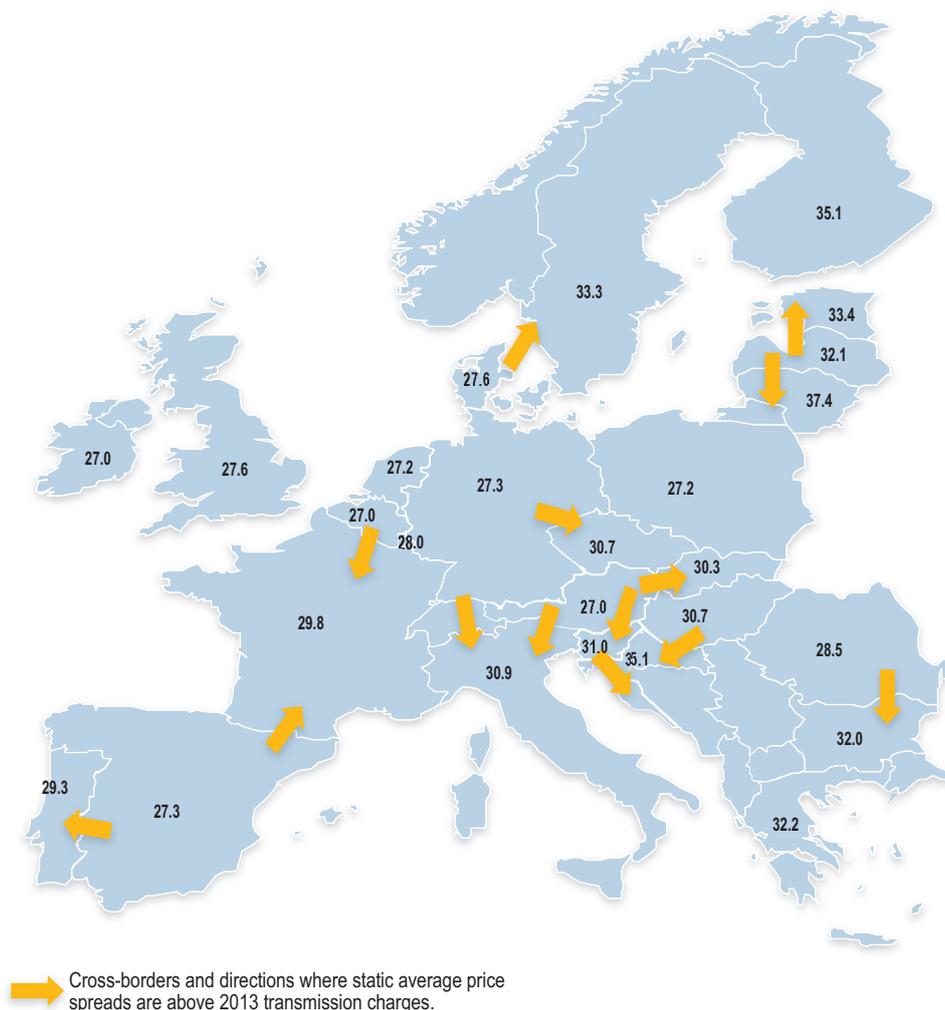
287 Unused physical capacity provides an indicator of the maximum new supplies which could be attracted to an adjacent market. Using unused physical capacity values assumes that all unwanted contractual capacity is made available on the secondary market and that no contractual congestion remains.

288 The scope of integration in EU gas wholesale markets can also be improved by several other instruments; (re)negotiation of upstream prices with suppliers, fairer allocation of existing capacities, the possibility of swapping flows between neighbouring countries, the deployment of an organised market fostering liquidity, the availability of alternative supply sources, and/or IPs tariffs aspects. Again, given the lack of data and the complexity of the issue, it has been not possible to include all these factors in assessments of other scenarios.

- 422 To our knowledge, the price convergence effect of new market entrants in EU gas markets has not yet been studied. This renders forecasts uncertain, and means that the benefits can only be correctly gauged on a case-by-case basis through experience. Hence, the results of the analysis presented below are static and based on assumptions about the new competitor's offered price level. It is also worth emphasising that the socially optimal level of investment (assessed in a cost-benefit analysis) is not necessarily the one that allows a 100% price convergence i.e. the costs of the new infrastructure could outweigh the benefits of lower wholesale prices.
- 423 The analysis is based on 2013 assessed wholesale price levels, recorded IPs capacity utilisation and registered gas flows. These inputs result from present market features and stakeholders' positions, but their interdependence could change in time, resulting in different values in the future. This analysis is not intended to forecast how the real physical flows should occur or which infrastructures should be constructed; it is intended to analyse only the range of welfare gains that seem to be theoretically feasible.
- 424 Figure 75 presents the 2013 EU MSs wholesale price levels used in the assessment. The blue arrows identify those border crossings and directions where zonal price spreads were – on a static yearly average basis – above the 2013 transmission charges at the respective IPs²⁸⁹.

289 2013 cross-border IPs transmission tariffs across the EU were presented in the Agency/CEER MMR 2012, p. 194.

Figure 75: EU-26 Average annual cross-border gas wholesale price spreads – 2013²⁹⁰ (euros/MWh)

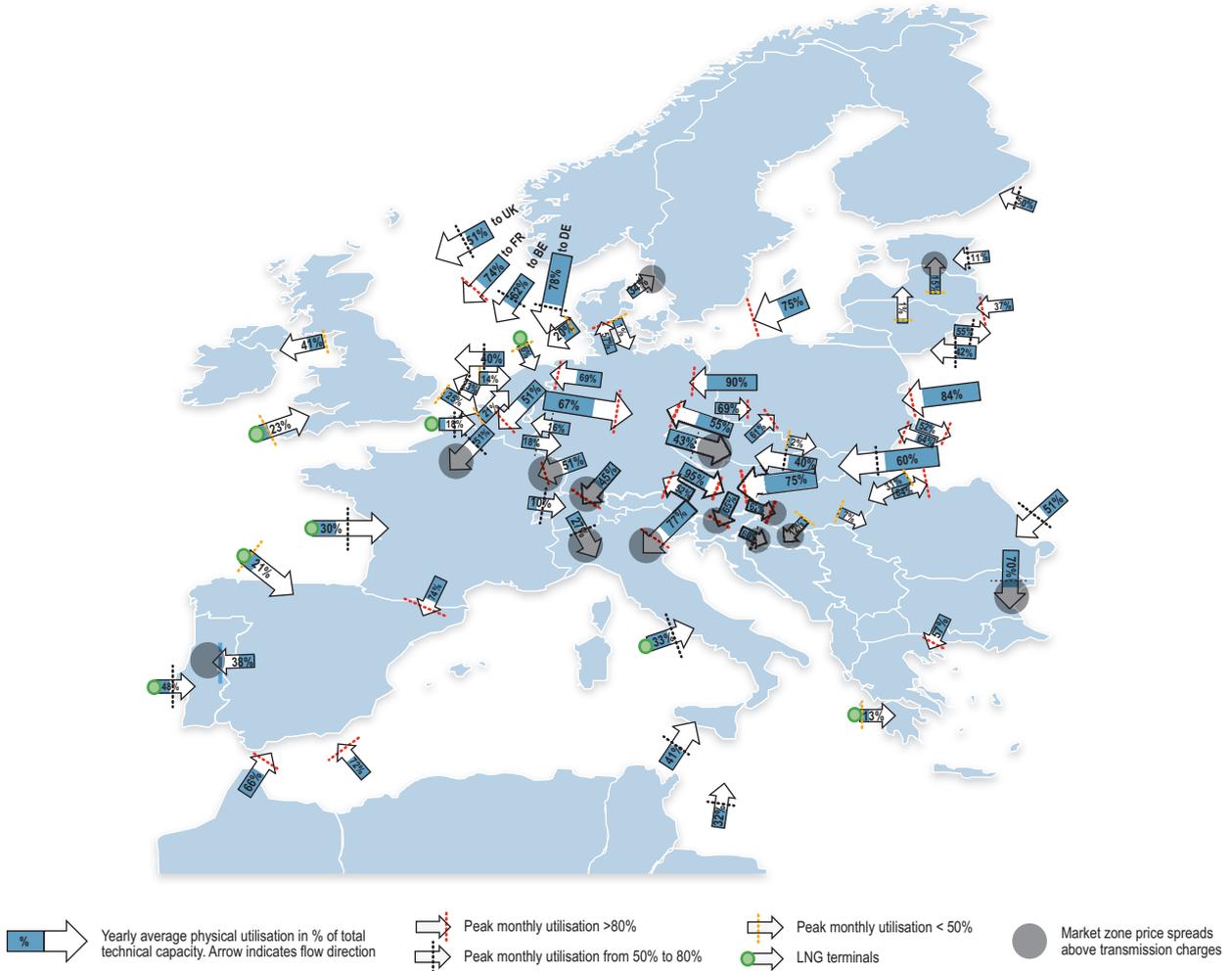


Source: Eurostat Comext, Platts, NRAs data (2014) and ACER calculations

Note: As indicated in the note accompanying Figure 73, the indicated prices result from the application of the ACER/CEER MMR2013 methodology that, given its limitations, may result in inaccuracies for certain MSs.

425 Figure 76 shows physical capacity availability values for all EU-26 cross-border IPs in 2013. Those cross-border IPs connecting market zones where the price spreads were above the transmission tariffs are indicated by a grey circle.

Figure 76: EU gas cross-border IPs physical capacity utilisation – 2013 (%)



Source: IEA, NRA data (2014) and ACER calculations

Note: Utilisation data refer to annual physical flows registered as a percentage of total technical capacity. Arrows (and circles) are depicted only if physical flows were registered in the indicated direction in 2013. Values represent the weighted average of all the IPs at each border. If they had occurred, swapping trades on certain bidirectional IPs could have signified higher contractual utilisation rates (i.e. the interconnector between Belgium and the UK, and between the Netherlands and the UK).

426 Building on the data presented in Figure 75 and Figure 76, Figure 77 present the potential net welfare gains that could be achieved by optimising the unused interconnection capacities between adjacent pairs of market zones maintaining price spreads above transmission tariffs in 2013. Calculations are presented on an aggregated yearly basis, but they were made by using monthly data on prices, capacity availability and gas demand per MS.

- 427 The prices that could be offered by a hypothetical new competitor entering the high priced market from the lower priced one are assessed by applying varying gross profit margins on the initial adjacent zones' price spread, including transmission charges. Two different percentages were considered: the new entrant selling gas with a profit equal to 25% and 75% of the existing price spread²⁹¹.
- 428 Unused capacities are also segregated in the assessment at two levels: total yearly aggregated unused physical capacity and technical minus peak-month idle capacity. Due to the fact that unused capacities are not uniformly distributed during the year, peak utilisation constitutes a relevant factor for inclusion in the analysis²⁹².
- 429 The pairs of MSs appraised on the x-axis of Figure 77 were selected on the basis of the co-existence of theoretically profitable price spreads between adjacent zones and coincident unused physical capacity. Some of the specified borders and flow directions over which the net welfare assessments were performed do not coincide with the predominant physical flow directions registered in 2013. In those cases, the capacity availability analysis was assessed on the basis of reverse flow capacity availability.
- 430 At some IPs, various factors may determine flow directions in the opposite direction to the one that the zonal price spreads would theoretically indicate as profitable. These include lack of liquid organised markets, lack of trading counterparts, contractual obligations on exact delivery points for supplies, gas resale restrictions, the extent of volumes or shippers' specific contract prices and individual market decisions.
- 431 For example, from the Czech Republic to Germany, or from Slovakia to Austria, real flows are driven by German and Austrian shippers importing high amounts of contracted Russian gas, side-stepping the adjacent zones' markets, which merely constitute a transit path. As an arbitraging trade would²⁹³ in principle result in beneficial gas transactions in the opposite directions, these reverse directions are appraised for welfare calculations in Figure 77. In the case of the French-Spanish border, the overall wholesale prices assessed²⁹⁴ signal that the profitable utilisation direction would be to France from Spain. However, factors such as the redirection of certain Spanish imported LNG volumes to more profitable Asian and Latin American markets, the lack of a liquid organised market in Spain, and/or the reliance on long-term contracts, may, in reality, determine the physically predominant direction as France to Spain. In these three cases, the available cross-borders capacities were appraised on the basis of reverse flow capacity availability values (see Figure 77 Notes).

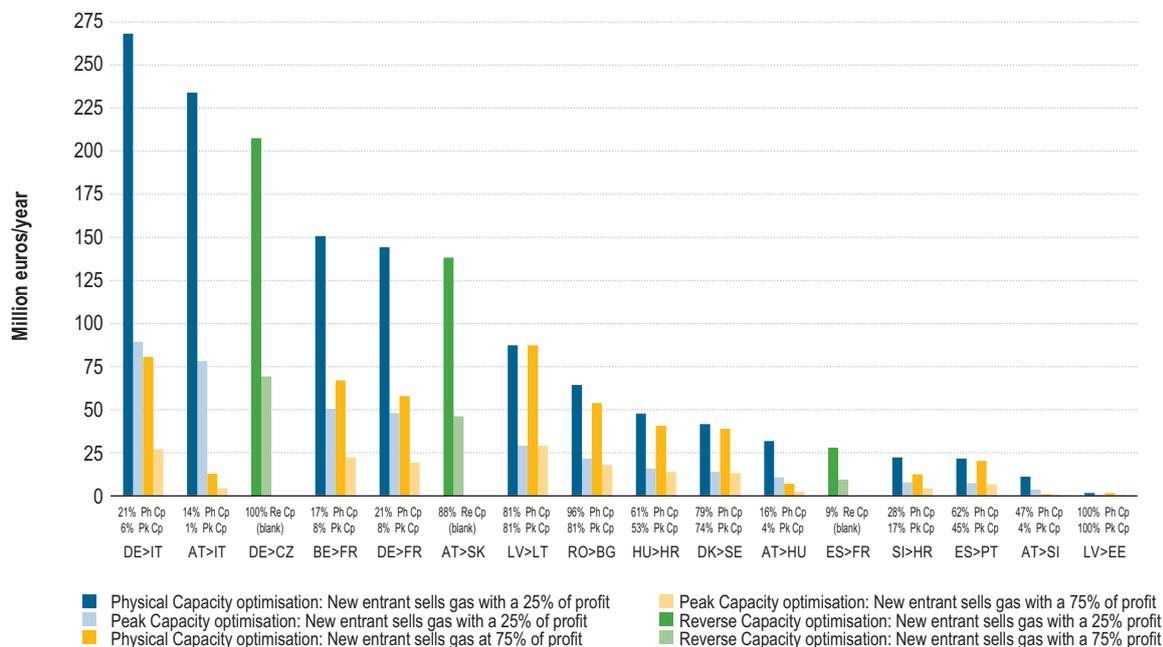
291 Example: MS A (the low exit price one) features a price of 27 euros/MWh and MS B (the high entry price one) a price of 30 euros/MWh. Transmission tariffs are set at 1 euro/MWh. Initial market zones price spread, including transmission tariffs is 2 euros/MWh. In the established scenario, the new entrant would buy gas in MS A, and pay transmission charges and sell the gas in MS B, applying the profit percentage on the initial price spread. This means that it would sell the gas either at a) 28.5 euros/MWh (25% profit: $27 + 1 + 2 \times 25\% = 28.5$) or b) 29.5 euros/MWh (75% profit: $27 + 1 + 2 \times 75\% = 29.5$).

292 IPs contractual values are in part determined by the peak utilisation levels during the year anticipated by shippers. The scenario assumes that the difference between the IPs total technical capacities and peak-month registered flows constitute a valid proxy of the physical available capacities that the new entrants could realistically use when entering a new market. Even if according to CMP provisions all contracted but unused capacities should be released in the secondary market on a daily basis (ST UIOLI for certain IPs), it is arguably true that longer-term certainty on capacity acquisition may be necessary for new entrants' when entering a new market. See: Annex I to Regulation (EC) No 715/2009, point 2.2 Congestion management procedures in the event of contractual congestion: <http://www.entsog.eu/public/uploads/files/publications/CMP/2012/CMP%20annex%20final.pdf>.

293 For example, the flow from Germany to the Czech Republic is mostly a transit from Nord Stream via OPAL to Gazelle, back into Germany via Waidhaus; nevertheless, there is also a growing tendency to commercially flow/swap gas into the Czech Republic.

294 In Spain, the reference price considered is based solely on the Eurostat Comext average declared import prices data (according to CNMC data, spot OTC trading is done in Spain at a higher price than the declared gas import prices). In France, it is mainly based on this very same source, complemented with short-term hub products' average prices. See Figure 73 notes. Individual shippers' specific prices and commercial decisions may affect the final IPs utilisation. The Agency and CEER do not have access to shippers' individual prices.

Figure 77: Potential annual net welfare gains in different EU MSs if cross-border physical unused capacities were fully utilised – 2013 basis, monthly aggregated (millions euro per year)



Source: IEA, Eurostat, Platts, ENTSOG (2014) and ACER calculations

Notes: Physical Capacities (Ph Cp) refer to the technical capacities minus the physical registered flows in 2013. Peak Capacities (Pk Cp) refer to the technical capacities minus the peak month flows. The percentage numbers at left indicate the share of total yearly MSs demand that could be supplied with the referred unused capacities. DE>IT (1) refer to capacities and aggregated transmission tariffs through Switzerland. Reverse flow capacities previously identified for the exercise are denoted as Reverse Capacities (Re Cp).

- 432 On the basis of these assumptions, EU welfare gains could be obtained of up to a maximum of 1.5 billion euros on an aggregated basis if all physical unused capacities were optimised and the pricing strategy adopted by the new market entrants resulted in a 25% profit (i.e. undercut the prevailing price spread plus transmission charges by 75%). This would be reduced to 0.5 billion euros if the pricing strategy resulted in a 75% profit (i.e. undercut the prevailing price spread plus transmission charges by 25%)²⁹⁵. Under the arguably more realistic hypothesis of technical minus peak-month unused capacities optimisation, and 25% profit percentage, the welfare gains upper limit would amount to some 0.9 billion euros (0.3 billion if the comprised profit were 75%). The differences in the results in the two scenarios put the significance of peak utilisation values into context.
- 433 Subject to the limitations of the modelling assumptions, this assessment shows that if the underutilised physical (direct or reverse) capacity were optimised, it could nearly supply as much as the total demand of Bulgaria²⁹⁶, the Czech Republic, Estonia and Slovakia together, resulting in greater price convergence. To some extent, reverse flows have already been implemented between some of these markets, as pointed out in the next section.

295 In the implausible event that the new entrants obtained a 0% profit over the existing price spreads, the total EU welfare gains would be 2 billion euros, considering the optimisation of all physical unused capacities, and 1.2 billion euros considering the technical minus peak capacities case. The pricing strategies of the new entrants' effect on the total level of assessed EU welfare gains: new entrants' profits constitute in this sense a transfer to suppliers from the theoretical EU maximum gains.

296 Another caveat to be entered regarding the theoretical exercise is that in some zones, the current features of the network may not allow entry to the domestic supply market of an adjacent MS even if available cross-border transmission capacities were identified (e.g. entering Bulgaria from Romania would be affected by the fact that transmission and domestic networks are independently managed in Bulgaria, and flows mainly serve destinations beyond the country, such as Turkey and Greece).

434 On the basis of absolute values, the results indicate that again Italy and France²⁹⁷ would stand to gain the most if their price convergence with adjacent zones increased. Again, this effect is accentuated by the large demand in both these MSs. In recent years Italy has achieved increased price convergence with other NWE hubs, and the implementation of auctions for cross-border capacity with Austria can be expected to increase price convergence further in the coming years, thereby realising some of the potential welfare gains.

Investment in new capacities

435 Creating new cross-border interconnection capacity usually entails significant capital investments. Nonetheless, if additional interconnection capacity can be shown to reduce supply constraints and facilitate competition, the benefits could exceed the costs, thus producing welfare gains. The identification and endorsement across the EU of potential projects that could have an impact on higher market integration and lower price formation driven by enhanced competition is being currently executed under the EU regulatory framework²⁹⁸ governing the identification and development of priority corridors and projects of common interest (PCIs). This procedure involves all gas sector stakeholders. It entails the establishment of a methodology to assess projects benefits – cost-benefit analysis (CBA)²⁹⁹ – and the institution of mechanisms for dividing costs among those MSs benefitting from the projects: cross-border cost allocation (CBCA)³⁰⁰. Figure 78 illustrates the locations of the proposed locations.

297 See Figure 73 notes.

298 Regulation (EU) No 347/2013 on guidelines for trans-European energy infrastructure. See: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:115:0039:0075:EN:PDF> and PCI projects list: http://ec.europa.eu/energy/infrastructure/pci/pci_en.htm.

299 See: <http://www.entsog.eu/publications/cba-methodology#CBA-METHODOLOGIES>.

300 See: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2007-2013.pdf.

Figure 78: List of PCI gas projects



Source: European Commission (2014)

- 436 Some of the proposed projects connect market zones, which, on the basis of the 2013 static data analysis, have significant price differences. It would be misleading to suggest current price differentials are wholly driven by capacity constraints, but this suggests that several of the proposed PCIs have the potential to deliver significant welfare gains³⁰¹ if the projected savings from reduced prices exceed the net present value of investment costs.
- 437 Improved interconnections with adjacent, more liquid and lower-priced zones could achieve welfare gains in several EU MSs by introducing more price competition and a wider range of supply sources, but in order for these gains to be maximised, the development of efficient and functioning markets in all regions is essential. Efficient and stable hub price formation and market-oriented allocation and utilisation of capacities is crucial to allow gas to flow from lower-priced areas to higher-priced areas and thus to serve EU demand at least cost.

301 All other projects are intended to improve overall EU interconnection levels and may impact future price formation.

4.4 Improving the functioning of the internal market: removing barriers

4.4.1 Utilisation analysis of cross-border capacity

- 438 At a significant number of European cross-border points in 2013, a high percentage of IP capacity continued to be subject to long-term capacity contracts. Long-term capacity bookings play an important role in underwriting network investment decisions. However, when capacity is booked and not utilised, it can prevent shippers who want to flow gas, but who do not have long-term capacity rights, from accessing the system. Optimising the efficiency of capacity utilisation, and mitigating this contractual capacity congestion, is one of the main objectives of the Guidelines on Congestion Management Principles (CMP).
- 439 The *ACER 2013 annual report on contractual congestion at interconnection points*³⁰² concluded that contractual congestion is still a potential problem at a significant number of IPs, as at least one third of European IPs were found to be contractually congested³⁰³ in at least one side in the last quarter of 2013. This was particularly the case in North-West Europe³⁰⁴, but was also observed in Central Eastern and Southern Europe.
- 440 Utilisation levels of contracted capacity diverge significantly across Europe. At some IPs, contracted and utilised values are reasonably aligned. For different reasons, at other IPs, substantial differences exist between contractual values and actual utilisation³⁰⁵. The challenge is to ensure that unused capacity, whether or not strategically acquired, can and has to be easily returned to the market so that other shippers can use it.
- 441 This year, the Agency and CEER again analysed the issue of contractual congestion and physical capacity utilisation in a sample of the most relevant IPs in the EU³⁰⁶. Representative IPs were selected, providing a collection of the main gas flows throughout Europe. In some cases, appreciable differences between average contractual values and average physical utilisation rates were found, although contracted values are significantly determined by the annual peak utilisation levels anticipated by shippers.

302 See: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Gas%20Contractual%20Congestion%20Report%202014.pdf. Also, the CMP Comitology report raised this issue prior to the ACER report. See: <http://ec.europa.eu/transparency/regcomitology/index.cfm?do=search.documentdetail&aa8fTM56J8G1M3cAHteGgPYmC CSQ8RgFDLtuYd6SlvcxdbQ+Al/X9VTMRqv00VG>.

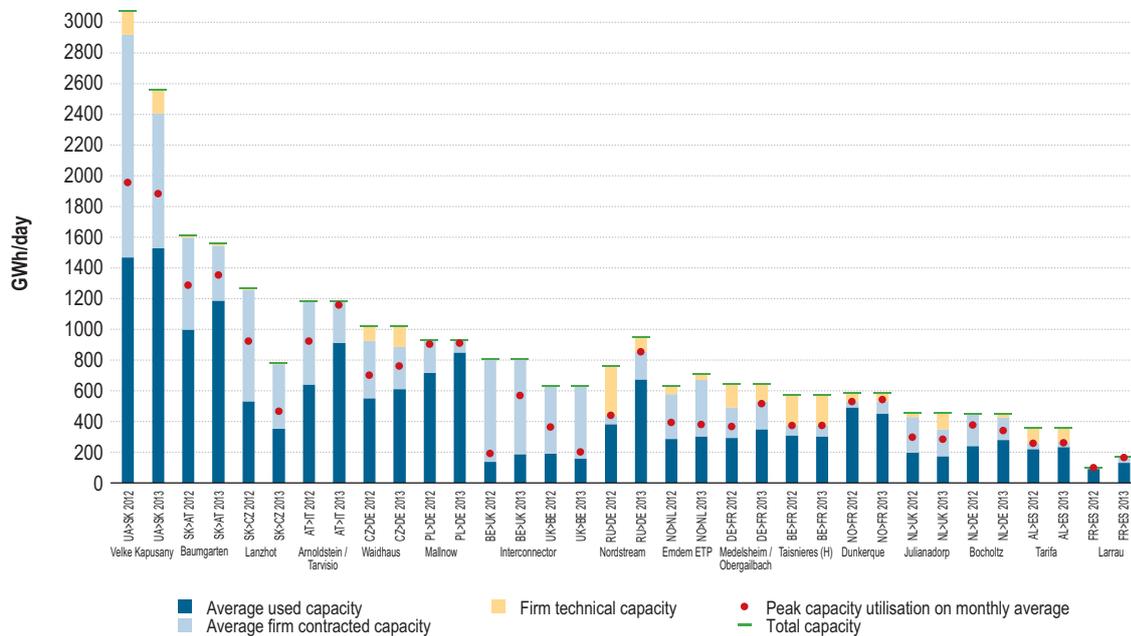
303 The report reviews the occurrence of contractual congestion in the light of the definition laid down in Regulation (EC) No 715/2009 and the CMP Guidelines. The purpose was to identify those IPs which would potentially be subject to the provisions contained in the CMP Guidelines (i.e. Firm Day Ahead Use it or Lose it). Some of the IPs identified as contractually congested could also be physically congested. At some IPs, congestion could not be identified, because the data was not available to do so. The report's conclusions should be treated with care, due to the short period and analysed and data quality issues.

304 Detection of contractual congestion in NWE was more significant than in other regions, arguably due to the better availability of data.

305 The reasons for existing differences between contractual and utilisation values are hard to substantiate in the absence of individual shippers' capacity contract data. Differences might give rise to a presumption of capacity hoarding in certain IPs in the absence of fully implemented congestion management procedures, but they may also be caused by the willingness of shippers to contract sufficient capacity to adjust their demand portfolios in the light of the renomination of flows. Other reasons may be that profiled bookings are not always as accessible or as cheap as yearly flat capacity. Finally, the difference may be also the result of the inconvenience of surrendering existing long-term capacity, particularly in the absence of other shippers willing to contract the surrendered capacities.

306 Only firm capacity is considered. Overall utilisation values are calculated on the basis of this (firm) capacity. Interruptible capacity is not considered.

Figure 79: Average used versus booked capacity at natural gas IPs in the EU – 2012–2013 (GWh/day)



Source: ENTSOG transparency platform and individual TSO data (2014) and ACER calculations

- 442 Based on the IPs considered, the average contracted firm technical capacity is 91% of total technical capacity, while the average utilisation rate is 60%, and the peak monthly utilisation value is 77%. The figures on capacity utilisation generally indicate that there is still some excess contracted capacity, but that, at times of seasonal peak demand, flows match technical capacity more closely.
- 443 As Figure 79 shows, the greatest divergences between contracted and utilised capacity were found at Slovakian IPs flowing gas from Russia (i.e. Velke Kapusany and Lanzhot). This was a result of reduced flows³⁰⁷ through this route in combination with high levels of booked capacity. Other significant divergences are found at IUK (Belgium/UK) and Julianadorp (the Netherlands/UK), where both had highly contracted capacity levels, but much lower physical utilisation rates. These differences may be explained by shippers enacting balancing trades in both directions in order to take advantage of reverse flow possibilities. Noticeable capacity utilisation increases in 2013 compared to 2012 were detected at Baumgarten and Tarvisio, where more Russian flows are entering Austria and being redirected to Italy, and at Nordstream, as higher utilisation levels (see Figure 80), supported by developments in OPAL/NEL German pipeline capacity were registered in 2013.

307 Alternative supplies from Nord Stream have also affected technical capacity availability from Ukraine into Slovakia. In particular, Velke Kapusany has faced significant technical capacity reductions – almost a third – since 2011.

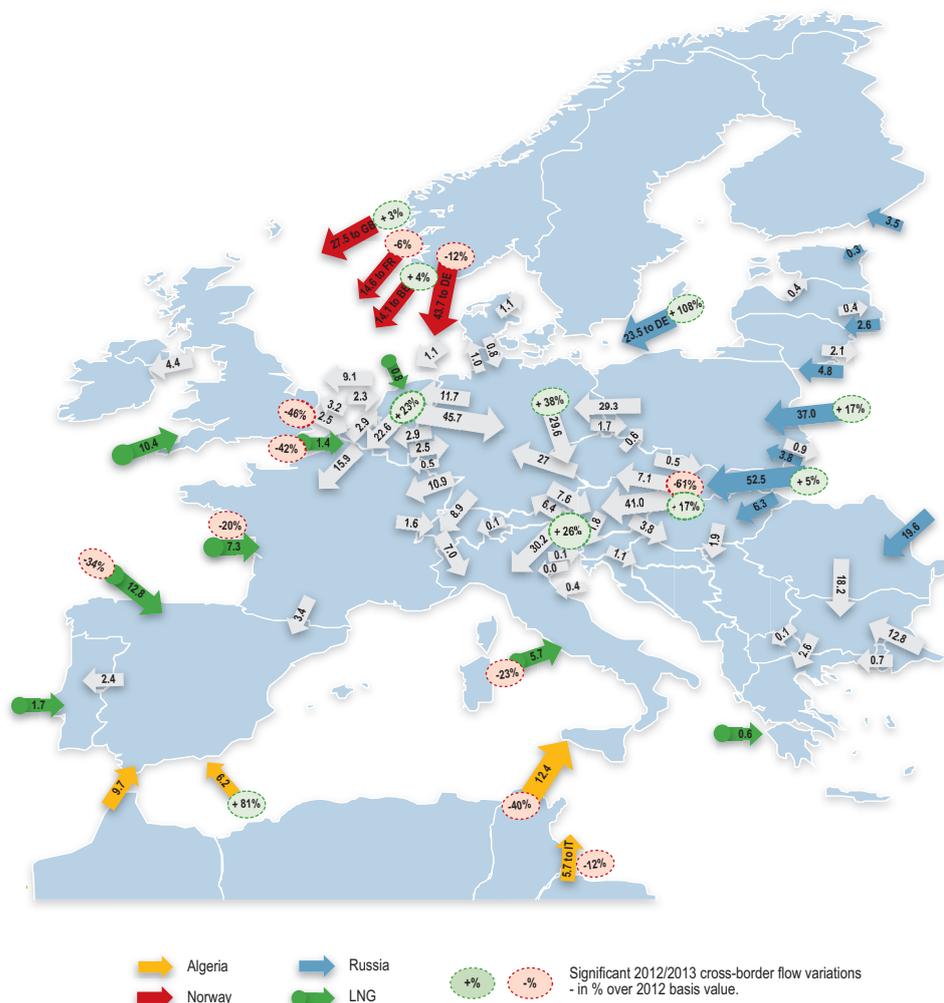
- 444 As noted above, a high percentage of IP capacity continues to be subject to long-term capacity contracts. Nevertheless, a new trend in capacity contracting has emerged in recent years (confirmed in 2013), which has seen a shift away from new long-term contracts in favour of more short-term capacity bookings. Data that confirm this trend can be seen in both the limited demand for long-term capacity revealed in the last PRISMA capacity platform yearly auctions, and the proportionally higher demand for short-term capacity products³⁰⁸. The move from long-term to short-term contracting could also be said to be reflected in the number of capacity contract terminations registered in medium- and long-term bookings in German bookable points³⁰⁹.
- 445 The emergence of a trend towards shorter term-capacity contracting is likely to be driven by a number of factors, including, but not limited to: uncertainty over the medium- and long-term demand for gas, also in the light of environmental objectives; the relative price of long- and short-term capacity products; the functionality of secondary capacity trading; and the relative flexibility of being able to match short-term capacity bookings with gas flows. However, the existence of surplus capacity at a significant number of IPs could also be a factor: in the face of reduced gas demand and relatively low gas demand growth forecasts, market participants in many locations are aware that the risk of not obtaining capacity in the short term is relatively low.
- 446 As noted above, long-term capacity bookings are important for underwriting new network investment decisions. The framework for validating and securing new investments has been analysed in the Blueprint on Incremental Capacity and the proposed amendment to NC CAM³¹⁰. The proposed model is intended to provide more transparency to market participants concerning the ways in which new and incremental capacity can be obtained, and gives priority to market-driven investments, meaning that investments will go ahead only if the value of financially binding future capacity bookings satisfies a proportion of the investment costs approved by the NRA. Since demand for incremental and new capacity will materialise only in locations where there is a perceived or real scarcity of existing capacity, the willingness of market participants to make longer-term capacity commitments in these locations would be expected to be materially different compared to locations with a demonstrable surplus capacity. In this sense, market fundamentals should determine stakeholders' interest in new projects.
- 447 In relation to actual IPs capacity utilisation at the regional level, Figure 80 depicts flow variations across EU cross-border IPs between 2012 and 2013.

308 PRISMA-offered annual capacity contracted rates are quite low, even in the first years ahead. It is noticeable that the PRISMA platform auctions only the capacities of those IPs where capacity is available to contract. The number of IPs allocating capacity through PRISMA and the total volumes of aggregated capacity allocated via PRISMA are increasing. On the other hand, the PRISMA auction results indicate a higher capacity appetite for short-term profile products. The overall contracting trend profiles may be affected by the possibility of surrendering existing flat-capacity contracts. See: <https://platform.prisma-capacity.eu/trading/reports.xhtml?conversationContext=1>.

309 Contract terminations in German IPs are possible only on the basis of the occurrence of tariff increases over a certain threshold or due to variations in the fundamental aspects of the contracts. See BKA 2013 Monitoring Report page 195: http://www.bundeskartellamt.de/SharedDocs/Publikation/DE/Berichte/Energie-Monitoring-2013.pdf?__blob=publicationFile.

188 310 See: http://www.acer.europa.eu/Gas/Framework%20guidelines_and_network%20codes/Pages/Incremental-Capacity.aspx.

Figure 80: EU cross-border gas flows in 2013 and main variations from 2012 (bcm/year)



Source: IEA (2014) and ACER calculations

448 Among the most significant year-on-year differences were: the increase in flows from Russia to the EU, both through Nord Stream and Eastern IPs; the reduction in LNG imports to the EU; the divergent trend in North African gas flows – flows from Magreb to Italy sharply declined, while flows from Algeria to Spain significantly increased; the increase in flows through Baumgarten into Italy; and the reduction of flows from GB to the Continent. The section below explains some of these developments.

i. Increase of Russian Nord Stream and Eastern flows

449 The Nord Stream pipeline is significantly affecting the traditional flow route of Russian gas into Europe. Nord Stream grants Russian gas direct access into NWE markets, enabling shippers who have contracted Russian³¹¹ gas to better compete in EU gas trading hubs. The increase in supplies through this recent interconnector continued in 2013.

311 Nord Stream flow increases in 2013 may have been supported by developments in OPAL/NEL pipelines capacities.

- 450 In previous years, higher Nord Stream gas flows years reduced Russian flows through the Ukraine and Belarus into Central Europe. However, the increased willingness of Gazprom to renegotiate the pricing of its supplies, the need to replenish EU gas storage stocks after the low stock levels reached at the end of March 2013, and the significant rise in German gas demand in 2013 resulted in an overall increase in Russian westward supply levels. Growth has also been registered, for example, in Polish entry border flows, among other places. Overall Russian exports were also supported³¹² by the disruption of Norwegian flows during the summer, and the drop of LNG imports.
- 451 Figure 80 also illustrates the increase in Russian flows through Austria and redirected flows from Austria to Italy. These flows were strengthened by the improvement in cross-border pipeline access conditions on the Austrian-Italian border, the Austrian CEGH transition to a VTP, and also due to the renegotiation of LT contract conditions in both MSs. These flows counter-balanced the decline in imports to Italy from Magreb as a consequence of political events in Libya.
- 452 Several Central-East European countries are striving to diversify their gas sources, in order to lower their dependency on Russian gas, and have been looking to Western Europe's spot markets as alternative sources. Larger counter-flows from Germany and Austria to the Czech Republic³¹³, Poland and Slovakia were observed, as shippers rely increasingly on German hubs to supply those markets. These commercial counter-flows are expected to increase in the future, given the profitable price spreads and the on-going procedures on security of supply obligations³¹⁴ to enable, or enlarge, bi-directional capacities. Flows from Poland and Hungary to Ukraine were also registered, as Ukraine faces significant price pressure for Russian gas and seeking alternatives supplies from Central European hubs³¹⁵.

ii. The effects of NBP and Continental hubs price convergence on gas flows

- 453 As liquidity and better price formation continue to develop at Continental hubs, the traditional lower price attractiveness – at least seasonally – of NBP declines. NBP versus Continental price differentials swing under particular seasonal conditions and supply-demand fundamentals. TTF is becoming an equally influential gas hub to NBP as an overall European reference, and this fact leads to an increase in physical flows into and from the Netherlands.
- 454 As Figure 80 illustrates, in 2013, flows from the UK to Continental Europe were further reduced and UK imports increased, counterbalancing the reduction of indigenous UK production and LNG diversion. This was in part due to the demand for gas to refill storage stocks following greater than expected depletion of stocks in the winter period at the start of the year. In addition, IUK maintenance works during June served to put downward pressure on NBP prices and to reduce exports during that month: as IUK exports normally account for a significant proportion of UK gas flows during the summer months, the outage meant this gas was confined to the UK market. On the BBL pipeline between the UK and the Netherlands, flows remained similar to 2012.

312 Aggregated Russian exports to Europe increased by 15% in 2013 to approx. 155 bcm. Source: IEA.

313 Most of the flow from Germany to the Czech Republic is a transit from Nord Stream via OPAL to Gazelle, back into Germany via Waidhaus. However, there is also a growing tendency to commercially flow gas into the Czech Republic.

314 Regulation (EU) No 994/2010 concerning measures to safeguard the security of gas supply. See: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:295:0001:0022:EN:PDF>.

315 The Ukraine aims to attract flows by offering attractive storage prices in comparison to those in adjacent EU MSs.

455 Greater reliance on TTF's liquidity – and its advantageous price spreads – from neighbouring markets led to an increase of exports from the Netherlands, which was sustained by an increase in the country's indigenous production³¹⁶.

iii. A significant reduction in LNG deliveries to Europe

456 In 2013, there was a notable reduction (30%) again in European LNG imports. The very attractive market prices in the Far East and Latin America kept LNG away from European shores. The more competitive prices of pipeline deliveries and the diminishing demand in the Iberian and Italian peninsulas also contributed to this outcome. Another significant trend observed during the year in this regard was the diversion of European destined deliveries: GLE reports that 12% of overall EU LNG imports were diverted as reloaded shifts. In Spain, this resulted in much higher Algerian imports, and some increases in French pipeline imports.

4.4.2 Utilisation analysis of underground storage facilities

457 Gas storage plays an important role in meeting EU gas demand. Over the four winter periods December–February 2010/11 to 2013/14, gas storage withdrawals averaged approximately 19% of EU gas demand. In those MSs with the highest gas storage volumes³¹⁷, monthly gas storage withdrawals peaked at over 50% of gas demand.

458 Gas storage can be used in a number of ways: to meet base load demand and foreseeable seasonal swing requirements; to meet short-run peak requirements, including unforeseen supply disruptions (depending on technical characteristics); and, in countries with regulated storage, it can be used explicitly for security of supply reasons. Underground storage is mainly operated on a cyclical basis as base load to adapt to foreseen yearly seasonal demand, but all storage installations can react to price changes, depending on their technical characteristics and on the availability of a transparent wholesale price reference in the market concerned.

459 The annual gas storage cycle generally involves larger injection values and increasing storage levels during the spring and summer months in order to cover higher autumn-winter demand when gas is withdrawn. Storage gas is therefore not a primary source of gas supply, but because it allows the consumption of gas supplied in the summer months to be deferred, in effect it increases available gas supply over peak demand periods. Therefore, the availability of gas storage improves the liquidity of the gas market, potentially putting downward pressure on gas prices during these months.

316 However, Dutch production will be reduced in the coming years following the government decision to cut production by about a quarter, given the link between gas drilling and the increase in earthquakes in the region.

317 A map showing the location, technical characteristics and type of gas storage across the EU is available on Gas Infrastructure Europe's website. See: <http://www.gie.eu/index.php/maps-data/gse-storage-map>.

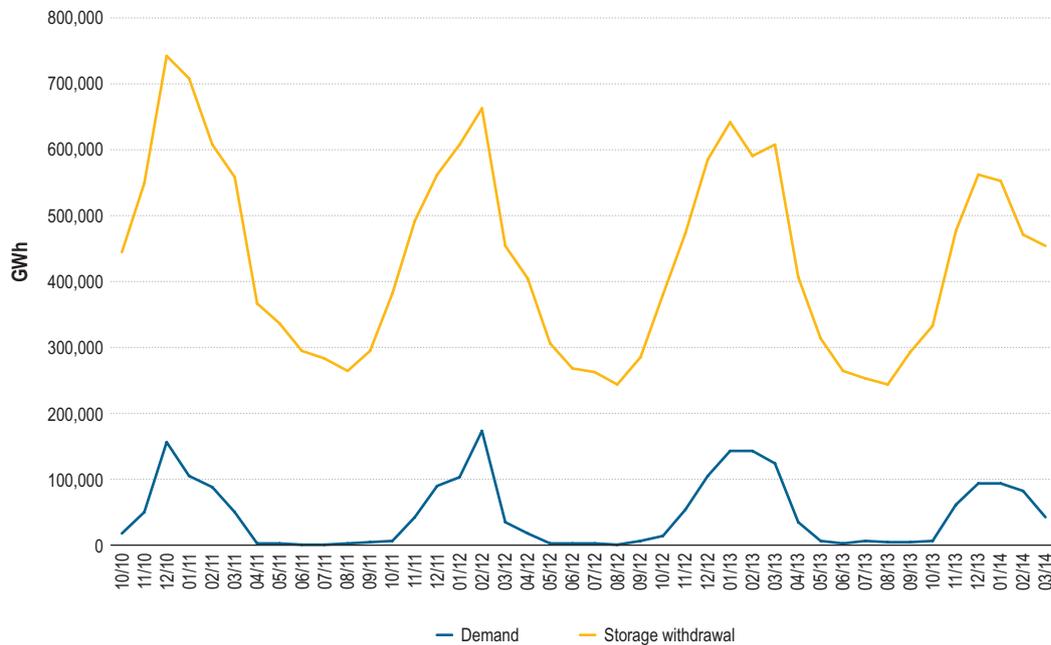
- 460 The correlation between demand and gas storage withdrawals is confirmed in Figure 81 which compares monthly gas demand with monthly gas storage withdrawals over the period October 2010 to March 2014. The data shows that storage withdrawals are highest during the winter peak demand months, i.e. December, January, February, and in the case of winter 2012/13, March, and lowest during the summer months. However, in recent years, storage stock levels and utilisation rates have shown significant variation: the stock level at the end of winter 2012/13 was significantly lower than in the preceding two years³¹⁸, while in winter 2013/14, gas storage withdrawal volume was much lower than in the preceding three years.
- 461 Decision making about the extent to which storage is used is based on a mix of economic, commercial and regulatory considerations. On the supply side, factors which can affect gas storage injection include: mandatory storage obligations at MS level, forward gas supply contracts held by gas storage users, storage capacity charges, transmission network tariffs³¹⁹ for putting gas into storage, as well as forecast winter-summer³²⁰ gas price spreads. On the demand side, factors which can affect gas storage withdrawal include: regulation of gas storage prices at MS level, long-term gas storage contracts and the terms and conditions for the use of those contracts, transmission network tariffs for withdrawing gas from storage, the level of gas demand generally and the price of storage gas relative to spot prices and prompt prices. The balance between the factors affecting gas storage utilisation varies between MSs; therefore, specific gas storage utilisation rates at a MS level can be fully understood only within this context.

318 Concern about the low end-of-season stock level for winter 2012/13 was identified by CEER in its November 2013 interim report on 'Changing storage usage and effects on security of supply'.

319 A transmission network tariff is usually paid to put gas into storage (exit capacity charge) and to take it out again (entry capacity charge). Different methodologies for calculating transmission tariffs for gas storage are currently used among MSs. In some MSs, tariffs for accessing gas in storage are discounted, while in others they are not. To harmonise the principles applying to the setting of storage tariffs, the Agency made specific provision for storage in its Framework Guidelines on harmonised transmission tariff structures. The FG specifies that in setting or approving gas storage tariffs, NRAs should consider, among other things, the economic benefits that storage may provide to the transmission system. The Network Code on transmission tariffs is under development by ENTSOG.

320 The winter-summer gas price spread at a given hub can be calculated as the difference between the average price for a given gas supply contract at that hub over the months October to March and the average price of the same contract over the months April to September. Where the price spread is expected to be low, the attractiveness of holding gas in storage is reduced because, all other things being equal, the margin between the price at which the gas can be sold at market (in winter) and the price paid for it (in summer) is reduced. Similarly, where an anticipated winter-summer spread does not materialise, demand for gas in storage is also reduced because the price saving in buying storage gas instead of at the hub is reduced.

Figure 81: EU-26 Gas demand versus gas storage withdrawal – 2010–2014 (GWh)



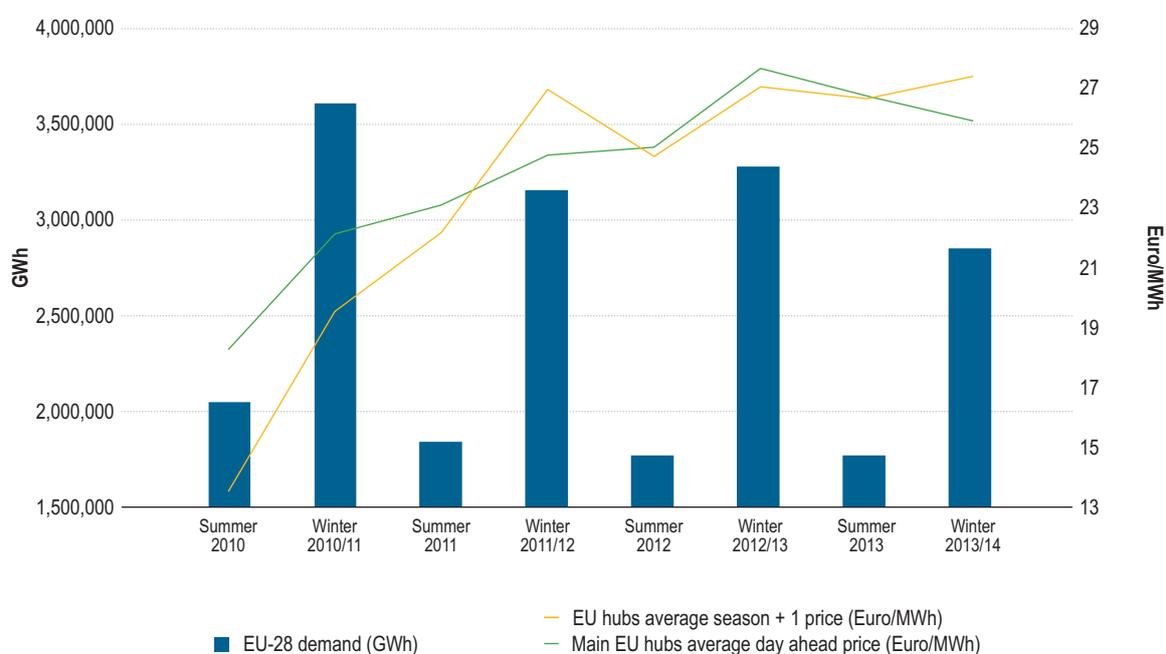
Source: Eurostat, Gas Infrastructure Europe (2014)

462 In theory, factors such as regulated storage obligations and the level of transmission network tariffs vary the least from year to year; therefore they would not be expected to explain EU-26 aggregate year-on-year gas storage changes. The materiality of commodity prices relative to other factors in the gas storage value chain suggests that the winter-summer gas price spread has a strong influence on aggregate gas storage utilisation. The section below investigates the relationship between recent trends in gas storage utilisation, gas demand, and a sample of aggregate winter-summer price spreads at the main EU hubs.

Understanding recent trends in gas storage utilisation

463 Gas injected into storage is likely to be supplied on a variety of short- and medium-term contracts. In turn, gas withdrawn from storage competes against a variety of short- and medium-term gas price contracts. Figure 82 compares seasonal average day-ahead gas prices for the main EU hubs³²¹, seasonal average ‘season plus one’³²² gas prices for a selection³²³ of the main EU hubs and EU seasonal demand over the period October 2010 to March 2014. A ‘season plus one’ contract and other medium-term gas price contracts allow gas users to hedge the risk of day-ahead gas price volatility. Comparing ‘season plus one’ prices alongside day-ahead prices allows some of the hedging effect to be factored into the analysis.

Figure 82: EU-26 seasonal demand and average seasonal day-ahead prices for the main hubs in Europe – 2010–2014 (GWh and euros/MWh)



Source: Eurostat, Platts (2014) and ACER calculations

464 The comparison shows significant variation both across winter seasonal demand and between prices. However, although average seasonal prices increased over the period, the winter-summer spread (calculated as the difference between the average winter price and the preceding summer price) of both day-ahead and season plus one prices shows a downward trend. The same is true for winter demand. For winter 2013/14, the winter-summer average seasonal day-ahead price spread was -0.85 euros/MWh (25.93–26.78 in Figure 82) meaning that gas was actually more expensive in the summer. Clearly lower winter demand, as a consequence of warmer temperatures in winter 2013/14 compared to winter 2012/13 contributed to this negative spread, but given that summer 2013 demand was still lower than winter 2013/14 demand, more benign supply conditions must have

321 Austria (CEGH VTP), the Netherlands (TTF), Italy (PSV), France (PEG), Germany (Gaspool and Net Connect Germany); UK (NBP); and Belgium (Zeebrugge).

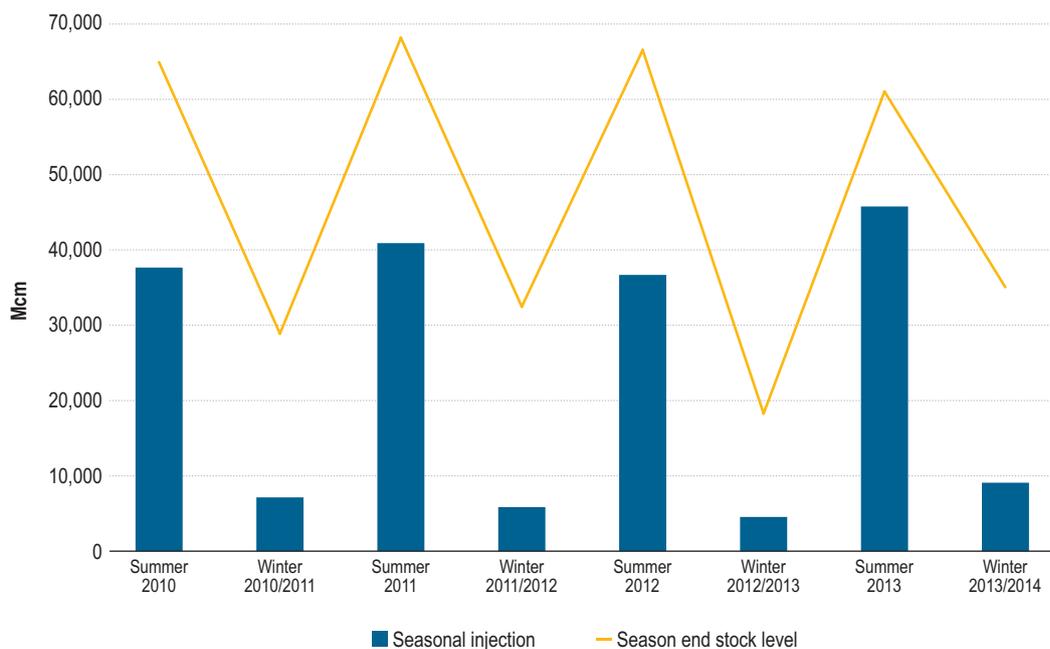
322 A ‘season plus one’ contract is a contract to take gas at a given price for each day of the season ahead. The average ‘season plus one’ price for winter 2012/13 is the average of the prices paid for that contract on each day of the period 1 April to 30 September 2012.

323 France PEG, Germany Gaspool, and Net Connect Germany, UK NBP; and Belgium Zeebrugge. Data for France PEG and German Gaspool was available from September 2011 only. Season plus one data was not available for Austria CEGH VTP, the Netherlands TTF or Italy PSV.

been the key driver. For seasonal average ‘season plus one’ prices, the effective winter-summer spread fell from 5.94 euros/MWh in winter 2010/11 down to 0.72 euros/MWh in winter 2013/14.

- 465 The data in Figure 81, considered together with the data in Figure 82, suggest a strong relationship between demand and the winter-summer price spread, and between the winter-summer spread and gas storage withdrawal volumes. The lowest and the highest demand seasons and winter-summer spreads are coincident (winter 2013/14 and winter 2010/11 respectively). Furthermore, when demand increased in winter 2012/13, so too did the average seasonal day-ahead gas price spread. Given that price spreads are a function of average gas prices, and that gas prices are determined when supply meets demand, this relationship is not surprising. If we assume that supply conditions are stable, reduced winter demand is likely to put downward pressure on winter gas prices, thus lowering the winter-summer price spread. Nevertheless, the data provide an important indication that if winter demand increases, the winter-summer spread is also likely to increase.
- 466 A strong relationship between winter-summer gas price spreads and gas storage withdrawals is also suggested by the fact that the year (2013/14) when the winter-summer gas price spread was the lowest coincided with the year when gas storage withdrawal volumes were the lowest, and by the fact that in 2012/13, when the day-ahead gas price spreads increased, so too did the total volume of gas storage withdrawals. However, it is important to note that gas storage withdrawal volumes are also likely to be a function of gas storage stock levels and gas storage injection volumes in the preceding season. Figure 83 compares end-of-season EU gas storage stock levels against aggregate EU gas storage seasonal injection volumes. The data shows a much lower end-of-season stock level for winter 2012/13 than for the other years in the series.

Figure 83: Gas storage seasonal injection versus end-of-season aggregate stock level – summer 2010 to winter 2013/14 (mcm)



Source: Gas Infrastructure Europe (2014) and ACER calculations

- 467 The figure shows a difference in end-of-season stock levels between winters 2012/13 and 2013/14 and a difference between the preceding summer seasonal injection volumes for both years. The seasonal injection volume for summer 2013 was much higher (24%) than for summer 2012, while gas storage withdrawals during winter 2013/14 were much lower (35%) than winter 2012/13.
- 468 Developments in winter-summer gas price spreads could also help explain trends in gas storage injection volumes and, therefore, in conjunction with withdrawal volumes, end-of-season stock levels. Average seasonal day-ahead hub prices in summer 2012 were slightly higher than in winter 2011/12. This relative flat-lining of day-ahead hub prices during 2012 may have lowered expectations of a significant winter-summer spread for winter 2012/13, which may have discouraged high gas storage injection volumes. In fact, the winter-summer day-ahead gas price spread for winter 2012/13 turned out to be higher than the preceding year. This, in combination with higher than expected demand in March 2013, is likely to have led to the withdrawal of the observed volumes and the consequential lower than average end-of-season stock level.
- 469 At the end of winter 2012/13, low end-of-season stock levels raised concern in some quarters regarding the adequacy of EU gas storage stocks. The end-of-season stock level for winter 2013/14 returned to the levels seen in winters 2010/11 and 2011/12, allaying these concerns, at least in the short term. This year, the most obvious question in respect of gas storage is whether the much lower withdrawal volumes in winter 2013/14 are likely to lead to a trend in favour of lower storage utilisation.
- 470 The data presented in this chapter would suggest that the answer to this will largely be a function of future trends in winter-summer hub price spreads. If winter demand returns to higher levels, or if EU gas winter supply conditions are tighter than in 2013/14, it is possible that aggregate EU winter hub prices will rise to the extent that storage gas becomes competitive, and gas storage injection and withdrawal volumes increase.
- 471 If the low winter-summer hub price spread trends endure, it is likely that gas storage utilisation rates will remain relatively low. If a higher winter-summer spread develops, as in 2012/13, it is likely that storage utilisation will respond. If lower spreads are a consequence of relatively benign supply conditions, then it is unlikely to present a short-term security of supply risk. If it is more as a consequence of subdued aggregate winter demand, security of supply concerns could arise as a result of demand-side shocks. Demand data for winter 2014/15 will provide more evidence to test this hypothesis, but it is important to note that although storage injection volumes in summer 2012 were low, and in March 2013 demand was higher than expected, at an aggregate level there was sufficient gas in storage to serve demand with a margin to spare.
- 472 As indicated above, a number of factors affect specific gas storage utilisation rates. However, given the importance of the winter-summer spread to the economics of gas storage, if winter-summer hub price spread reductions endure, the incentive to invest in new or existing gas storage facilities could be reduced. In its interim report on Changing Storage usage and effects on security of supply, CEER indicated that there is currently sufficient gas storage capacity to meet demand. However, investment lead times for delivering new gas storage capacity may not be able to anticipate an unexpected increase in gas storage demand; therefore, the monitoring of aggregate EU gas storage capacity trends would seem appropriate for security of supply reasons.

4.4.3 Cross-border transportation tariffs

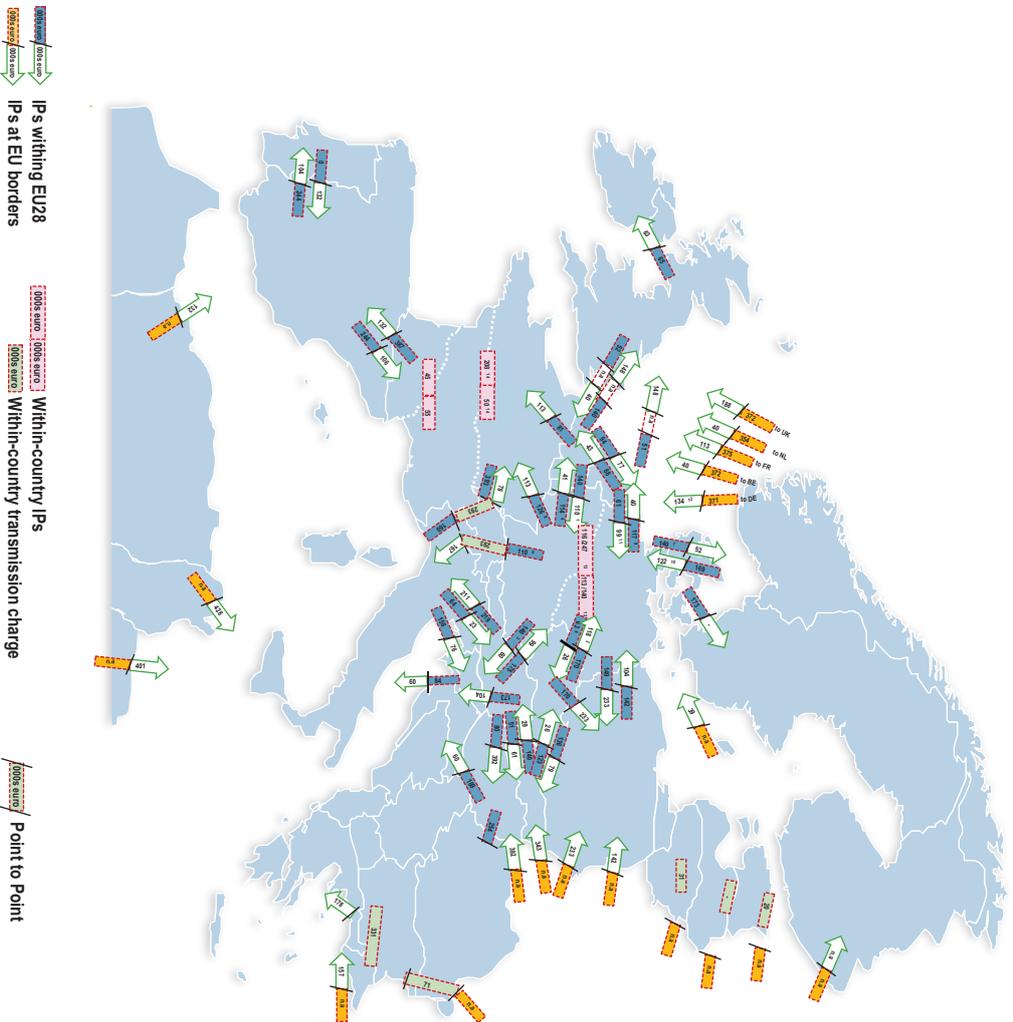
- 473 Cross-border IPs transmission tariffs vary across the EU. The tariff level at a given IP is a function of the regulated revenues the TSO is allowed to collect (as determined by the NRA), technical factors³²⁴, and the cost allocation methodology used to determine the proportion of the regulated revenue payable at each point on the network. Differences of approach are not necessarily problematic where tariffs derive from an objective and transparent methodology, although inconsistent tariff structures across Member States result in more complexity for cross-border transmission network users.
- 474 From a user's perspective, tariffs should reflect the cost incurred in providing the specific transmission service in such a way that cross-subsidies between users are minimised. From a regulatory perspective, tariffs are set³²⁵ so that an efficient TSO will recover its costs. However, where tariff structures lack objectivity or do not reflect system costs, this can lead to discrimination, inefficient use of the transmission network, and potentially inefficient gas flows to the detriment of the internal market.
- 475 This year, the Agency and CEER again collected the EU-26 cross-border tariff information published by TSOs in order to identify variations in entry and exit transmission tariffs. While it is not within the scope of this report to make judgements about the structure of tariffs, it is apparent that pronounced differences³²⁶ exist in terms of tariff magnitudes at EU borders, and sometimes within countries when multiple domestic zones are present.

324 Factors such as the geographical and topological characteristics of the network, the extension of the system, the terrain, climate, and general macro-economic conditions affecting investment costs; the initial investment cost, the age of the network, and the depreciation regime; NRAs/TSOs tariff-setting methodologies and TSOs cost allocation strategies and rules or demand and supply characteristics.

325 The core features and parameters when setting tariff structures are: the tariff setting period, the capacity/commodity split, the entry/exit split, the cost allocation methodology, the reference price, the revenue reconciliation mechanism, the reserve price, product multipliers, seasonal factors and, finally, the payable prices. See the ACER justification document on the policy options 'Framework Guidelines on rules regarding harmonised transmission tariff structures': http://www.acer.europa.eu/Gas/Framework%20guidelines_and_network%20codes/Documents/Justification%20document%20Policy%20Options%20for%20Harmonised%20Transmission%20Tariff%20Structures.pdf.

326 Again, these differences may be explained by the applied cost allocation methodologies and the technical factors of the network and do not necessarily mean that resulting tariffs are inefficient or do not reflect costs.

Figure 84: Average gas transportation charges through the EU-26 borders – 2013 (thousand euros)



Source: TSO and NRA data (2014) and ACER calculations

Note: Simulation of cross-border charges for flowing 1 GWh/day/year by entry/exit IP, based on published 2014 tariffs in March (in thousand euro). Average weighted charges by border, by TSO, and by IP capacity level.

Notes:

At those cross-border points featuring more than one IP – but with dissimilar tariffs – a single charge per border was estimated as the weighted average of charges according to offered capacity per IP and/or distinct TSO.

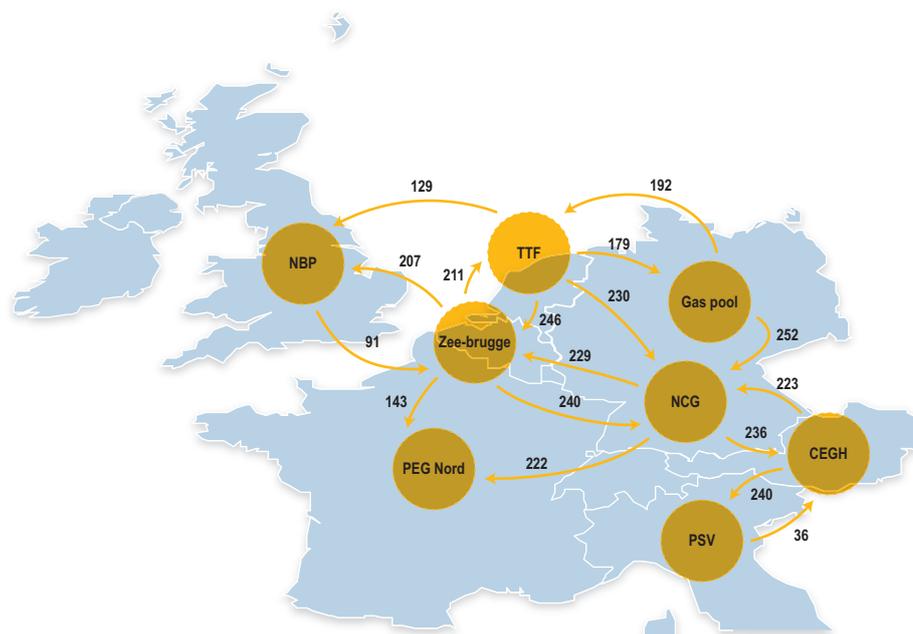
For example, cross-border flows in Germany can attract different charges, depending on the IP and/or TSO at the same IP. In Germany, cross-border tariff ranges for the assumed 1GWh/day/year flow may vary as follows (min/max in thousand euro):

- 1 BE to DE: 73/119
 - 2 CZ to DE: 100/171
 - 3 DE to AT: 95/184
 - 4 DE to BE: 60/145
 - 5 DE to CH: 69/183
 - 6 DE to CZ: 105/145
 - 7 DE to DK: 140/183
 - 8 DE to FR: 124/145
 - 9 DE to NL: 113/140
 - 10 DK to DE: 110/207
 - 11 NL to DE: 43/139
 - 12 NW to DE: 108/159
- “DE” above is used to refer to flows to/from Germany, although actual flows go to and from either German domestic zone (NCG or GASPOLL). See details on the German market zone to which each cross-border IP connects here: <http://www.entsog.eu/maps/transmission-capacity-map>

- 13 Range of min/max E/E charges to flow gas between TSO zones in Germany.
 - 14 North to South/South to North: single E/E payment.
 - Between TIGF /GRTgaz Sud zones: Entry and Exit payments.
 - 15 Transit charges, independent of transmission charges.
- Charges for simulated flows were estimated on the basis of yearly contract duration, using units of measurement published by TSOs. In those cases where tariff units of measurement were not published on a yearly basis, a direct conversion was performed. At some IPs, different tariffs could apply to different capacity contracting periods, but this was not considered in this year’s exercise. More details can be found in the Annex on EU27 IP tariffs.

- 476 When cross-border transmission tariffs are higher than wholesale market price spreads across border zones, there is in principle no economic incentive to trade gas between those zones, since the theoretical profit of the trade would not compensate the capacity payments. Where tariffs derive from an objective and cost-reflective cost allocation methodology, this could be said to apply an efficient constraint, to the extent that tariffs represent the system costs incurred in allowing the gas to flow. Where this is not the case, transmission tariffs can be said to negatively affect wholesale market integration.
- 477 As transmission capacity between zones has a cost, and must be paid for, arguably³²⁷ the value of transmission tariffs constitute a barrier to full price convergence which should not be eliminated. Moreover, the fact that in a growing number of cases the value of transmission tariffs is higher than wholesale market price spreads may be another indicator that a high degree of price convergence (see Figure 72) has already been achieved.
- 478 Situations in which transmission charges are above price spreads³²⁸ are increasingly frequent in new, as prices increasingly converge, because they are highly interconnected, feature liquid organised gas markets and generally apply capacity allocation mechanisms in accordance with the CAM NCs provisions³²⁹. Trade at these IPs may favour higher volumes, as the margins are becoming lower.

Figure 85: Number of days in 2013 during which transmission charges were above NWE hubs day-ahead price spreads



Source: Platts, ENTSOG (2014) and ACER calculations

Note: Calculations do not include VAT. Charges in exempted BBL and Interconnector IPs were not considered.

327 Considering only two zones with two differentiated wholesale prices – resulting on the zones demand/supply fundamentals – and a unique cross-border transmission capacity product with a single, fairly calculated charge.

328 At least among hubs' price references. Perhaps not so applicable to overall MSs wholesale price formation, also influenced by LT contract prices.

329 For example, BNetzA 2014 Annual Report (page 143) signalling the higher price convergence over the course of 2013 among German NCG and Gaspool hubs with Dutch TTF, see: http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Allgemeines/Bundesnetzagentur/Publikationen/Berichte/2014/140506Jahresbericht2013NichtBarrierefrei.pdf?__blob=publicationFile&v=2.

- 479 In some cases, cost allocation methodologies may result in transmission charges, which, as a result of the way in which certain categories of users are grouped, appear to favour one category or user or flow direction over another. Where this does not reflect costs, the effect could be the subsidisation of one category of user by another (domestic versus cross-border, or entry versus exit users, for example). Transmission tariff cross subsidies can lead to the inefficient use of transmission networks and, as indicated above, can cause inefficient cross-border gas trades.
- 480 To harmonise the approach to transmission tariff setting across the EU, the Agency published its framework guidelines on rules regarding harmonised transmission tariff structures³³⁰ in November 2013. The FGs provides a set of harmonised rules which have transparency; non-discrimination, cost reflectivity and tariff stability at their core. The assessment of policy options³³¹ accompanying the framework guidelines provided some examples of how final tariffs may vary according to the application of one of the four³³² cost allocation methodologies permitted under the FGs, but the full impact on the level of cross-border transmission tariffs will not be known until the full development and implementation of the network code has been achieved.
- 481 Therefore, the Agency and CEER encourage timely and efficient implementation of the future NC on tariffs³³³. The Agency and CEER would also find it beneficial if the industry developed network access tariff comparisons, especially in Central-East and South-East Europe, where tariff comparisons (or even the availability of data) have been lacking so far. Such comparisons exist in electricity and other network industries. The Agency and CEER encourage ENTSOG to work together with individual TSOs to make price and, possibly, underlying cost benchmarking possible in the near future.

330 See: http://www.acer.europa.eu/Gas/Framework%20guidelines_and_network%20codes/Documents/outcome%20of%20BoR27-5%201_FG-GasTariffs_for_publication_clean.pdf.

331 See: <http://www.acer.europa.eu/Media/News/Pages/ACER-assesses-policy-options-for-harmonised-transmission-tariff-structures-in-the-gas-sector.aspx>.

332 Postage stamp; Capacity-weighted distance; Distance to the virtual point; Matrix. See footnote above.

333 In November 2013 the Agency submitted framework guidelines on harmonised transmission tariff structures to the Commission. The network code on harmonised transmission tariff is under development by ENTSOG.

4.5 Conclusions and Recommendations

- 482 This Chapter demonstrates that progress continues to be made towards the integration of the internal gas wholesale market. Price convergence between MSs – an important measure of the extent of market integration – has increased, principally as a result of increased price competition leading to more long-term contract renegotiations.
- 483 During 2013, the supply of Russian gas to the EU increased significantly. The main drivers of this development were the increased willingness of Gazprom to renegotiate the pricing of its supplies, the need to replenish EU gas storage stocks after the low stock levels reached at the end of the winter, and the significant rise in German gas demand. Russian exports were also supported by a disruption of Norwegian flows during the summer, and by the decline in LNG imports. Several Central-East European countries are striving to diversify their gas sources in order to lower their dependency on Russian gas, and have been looking to Western Europe's spot markets as alternative sources. Larger counter-flows from Germany and Austria to the Czech Republic, Poland and Slovakia were observed. These commercial counter-flows are expected to increase in the future, given the profitable price spreads and the on-going procedures, driven by security of supply concerns, to enable or enlarge bi-directional capacities. Flows from Poland and Hungary to Ukraine were also registered, as Ukraine faces high prices of Russian gas and is seeking alternative supplies from central European hubs.
- 484 Despite significant advances, barriers to full market integration remain, including: lack of liquidity in many wholesale markets (ten MSs rely on a single country of origin for more than 75% of their supply); lack of transparency in wholesale price formation; the lack of adequate gas transportation infrastructure and the presence of long-term commitments for gas supply. These barriers and their implications were identified in the 2012 MMR report³³⁴, and their presence continues in 2013, albeit to a varying extent in different regions.
- 485 The bundled allocation of IPs capacities, the synchronised implementation of CMP mechanisms, the implementation of balancing provisions and the implementation of interoperability arrangements are advancing in the majority of MSs³³⁵. The timely adoption of these measures, along with the full transposition of the 3rd Package, is expected to advance the integration of the internal gas wholesale market, leading to greater price convergence and, ultimately, lower gas prices for all EU gas consumers.

334 See: MMR 2012, page 229.

335 According to April 2014 estimates, CMP guidelines have been fully or partially implemented by 27 TSOs in 13 MS, regarding CAM, 23 TSOs from 8 MSs are active in PRISMA and 4 other MSs have launched pilot capacity allocation through auction projects. In regard to the Balancing NC, two MSs (Austria and the Netherlands) are fully compliant with the provisions, while four are working to incorporate them in 2015, and five more are expected to do so in 2016, according to the established schedule. Interoperability and Tariffs NCs have not yet reached the comitology stage.

5 Consumer protection and empowerment

5.1 Introduction

486 Electricity and natural gas help to fulfil basic needs, including nutrition, warmth and the ability to participate in economic and social life. For this and a number of other reasons, consumers in general, and household consumers in particular, should be protected in order to ensure continuous access to energy and functioning energy (retail) markets. Otherwise, the danger persists that consumers are unduly denied access to energy and may become economically, socially and culturally isolated as a result.

487 This chapter monitors household (end) consumer protection according to the provisions in the respective articles of the 3rd Package. This European legislation is also aims to provide effective energy laws which guarantee that the ‘voice’ of consumers is heard and taken seriously by energy companies and other market actors. In particular, Article 3 of the Electricity and Gas Directives³³⁶, in combination with Articles 10, 11 and 12 of the Energy Efficiency Directive³³⁷ outline a set of measures which aim to:

- provide essential and free information to consumers, including information on switching suppliers, metering and billing, their rights, current legislation and means of dispute resolution, to ensure their (full) participation in liberalised energy markets;
- define the concept of vulnerable customers and ensure adequate safeguards with respect to their protection on Europe’s energy markets; and
- ensure a continuous supply of energy, especially in cases of vulnerability, including people living in energy poverty and poverty in general.

488 While the 2012 MMR assessed the level of compliance with the provisions for consumer rights in the 3rd Package, the 2013 MMR closely explores the underlying mechanisms of how EU law has been transposed into national legislation and, therefore, how the national legal frameworks protect final household consumers. A series of indicators measures how many consumers currently benefit from protection under the respective provisions from the 3rd Package in each country. The topics covered by this year’s Consumers Protection and Empowerment chapter are as follows.

- Universal service in electricity, i.e. the right for consumers to be connected to the electricity grid, as well as the right to be supplied with electricity at reasonable, easily and clearly comparable, transparent and non-discriminatory prices. To ensure the provision of universal service, MSs may appoint an electricity supplier of last resort (SoLR) and restrict disconnections in specific circumstances;
- Likewise, MSs may appoint a gas SoLR for gas consumers who are already connected, despite the lack of a universal gas service obligation in the EU legislation. Again, MSs may define procedures to regulate and restrict the disconnection process for non-paying gas consumers;
- Vulnerable consumers: MSs must define the concept of vulnerable customers, which may refer to energy poverty and be associated, *inter alia*, with the prohibition of disconnection of electricity and gas supplies to such customers at critical times;
- Consumer information: MSs shall ensure high levels of consumer protection, particularly with respect to transparency regarding contractual terms and conditions, general information and dispute settlement mechanisms;

336 Article 3 of Directive 2009/72/EC and Article 3 of Directive 2009/73/EC.

337 Articles 10, 11 and 12 of Directive 2012/27/EC.

- Easy free of charge switching: MSs shall ensure that eligible customers are able, in practice, to switch easily to a new supplier. For household customers, this must include measures such as (pre-) contractual information, and, among other things, up-to-date information about applicable prices, tariffs and charges, and how to complain and/or settle disputes; and
- Complaint handling and dispute settlement: MSs shall ensure that an independent mechanism such as an energy ombudsman or a consumer body is in place in order to ensure efficient treatment of complaints and out-of-court dispute settlements. Single points of contact shall provide consumers with all necessary information concerning their rights, current legislation and the means of dispute settlements.

489 In view of the above this chapter assesses: the elements of consumer protection (Section 5.2); consumer complaints (Section 5.3) and consumer access to information (Section 5.4). This chapter concludes with a recommendations section (Section 5.5).

5.2 The elements of consumer protection

490 The need for stronger consumer rights is mentioned in the Electricity and Gas Directives. Articles 3, 37 (electricity) and 41 (gas) and Annex 1 of these Directives particularly focus on protecting and empowering consumers, while assigning detailed monitoring duties and powers to NRAs. Importantly, “helping to ensure [...] that the consumer protection measures [...] are effective and enforced”³³⁸ is one of the duties outlined for regulatory authorities.

5.2.1 Supplier of last resort and disconnections

491 According to the Electricity Directive³³⁹, consumers have the right to be supplied with electricity of a certain quality within their territory at reasonable, easily and clearly comparable, transparent and non-discriminatory prices. To ensure that this provision of universal service is met, MSs can appoint a SoLR. Although the Gas Directive³⁴⁰ states that MSs may appoint a SoLR for customers connected to the gas grid, no universal gas service obligation exists. However, neither the Electricity nor the Gas Directive specifies the functions of a SoLR. For instance, the SoLR could step in to provide energy to those consumers who have not actively chosen a supplier on the liberalised energy market. Alternatively, the SoLR could be called upon to supply those consumers whose current supplier fails to do so, becomes insolvent or in other extenuating circumstances.

492 Table 5 below presents the various functions of national SoLRs as currently implemented in MSs according to national legislation. Generally speaking, the SoLR obligation has been transposed into national legislation in all MSs with the exception of France (electricity) and Bulgaria, France, Greece and Slovenia (gas). The various mechanisms have various functions, which may be roughly classified into three broader types.

- Firstly, the SoLR may support the consumer in the case of payment difficulties (options A and B in Table 5): for instance, in 16 countries, the electricity SoLR supports consumers if they cannot find a supplier in the market (the case in 9 countries in gas). In addition, in eight countries (six for gas), the SoLR takes over supply if a consumer is dropped by their current supplier;

338 Article 37(1)(n) of Directive 2009/72/EC and Article 41 para 1 (o) of Directive 2009/73/EC.

339 Article 3(3) of Directive 2009/72/EC.

340 Article 3(3) of Directive 2009/73/EC.

- Secondly, the SoLR mechanism may cover cases of supplier failure, e.g. bankruptcy or license revocation (options C, D, and E). As can be seen in Table 5, this is the main function of the SoLR for both electricity and gas across most MSs; and
- Thirdly, the SoLR can be seen as supporting inactive consumers (options F, G, and H), i.e. consumers who have not actively chosen a supplier following market opening, when moving house or after any temporary contract expires. While in some countries a so-called default supplier takes over in this case (e.g. Germany, Poland), this nevertheless covers an important consumer protection mechanism, which is covered here under the SoLR terminology as well.

493 It should be noted that customer supports may fall under a MS's broader (than energy) social protection and social security mechanisms rather than specific provisions within the energy market, such as those provided by the Supplier of Last Resort or default supplier. For example, a previous status review published in 2009 by CEER on the definitions of vulnerable customer, default supplier and supplier of last resort (E09-CEM-26-04) found that: "Almost all countries have support systems, not specific to the energy sector, for customers on low income or financially weak customers. The support systems mainly consist of financial support such as social allowances".

Table 5: Functions of the supplier of last resort in MSs – 2013

		# Countries Electricity	# Countries Gas
A.	If a final household customer does not find a supplier on the market (no energy supplier is willing to sign a contract with the customer)	15	8
B.	If a final household customer is dropped by its current supplier because of non-payment	7	5
C.	The current supplier of the final household customer has gone bankrupt and is no longer doing business	26	17
D.	The license of the current supplier has been revoked	20	16
E.	The license of the DSO has been revoked	4	2
F.	If a final household customer does not choose a supplier when moving home	10	6
G.	If a final household customer does not choose a supplier at market opening	12	8
H.	If a fix-term supply contract expires	9	6
I.	There is no supplier of last resort in the country	1	4

Source: CEER Database, National Indicators (2014)

Note: 28 jurisdictions covered. The question that was posed: "In what circumstances may final household customers turn to the "supplier of last resort" to ensure their continuous energy supply? Multiple answers possible."

494 In most MSs, the SoLR mechanism fulfils more than one of the aforementioned functions. Table 6 shows the country-specific functions of the SoLR according to the data available. In some countries (e.g. Cyprus and Romania), data suggests that all consumers were supplied by a SoLR, while in other MSs, no consumer was supplied by the SoLR in 2013, mainly due to the more limited function of the SoLR and/or absence of any events requiring their intervention. Due to this variability in functions, the numbers of consumers supplied by the SoLR remain generally incomparable across MSs, since they cover a range of different situations.

Table 6: Types of supplier of last resort in the EU – 2013

Country	Electricity			Gas		
	Supporting customers with payment difficulties	Replacing failing supplier/DSO	Supplying inactive customers	Supporting customers with payment difficulties	Replacing failing supplier/DSO	Supplying inactive customers
Austria	X	X		X	X	
Belgium	X	X		X	X	
Bulgaria	X	X	X		No supplier of last resort	
Cyprus	X	X	X		Not applicable (no gas)	
Czech Republic		X			X	
Denmark	X	X	X	X	X	X
France			No supplier of last resort			
Germany	X	X	X	X	X	X
Estonia	X	X	X	X	X	X
Finland	X	X			X	
Great Britain		X			X	
Greece		X	X		No supplier of last resort	
Hungary		X			X	
Ireland		X			X	
Italy	X	X	X	X	X	X
Latvia		X			Data not available	
Lithuania	X	X	X		X	
Luxembourg		X	X		X	X
Malta	Only one supplier of electricity				Not applicable (no gas)	
Norway	X	X	X		Not applicable (no gas)	
Poland		X	X			X
Portugal	X	X		X	X	
Romania	X	X	X	X	X	
Slovakia		X			X	
Slovenia		X			No supplier of last resort	
Spain	X	X	X			X
Sweden		X	X	X	X	X
Netherlands		X			X	

Source: CEER Database, National Indicators (2014)

495 The EU Directives³⁴¹ also foresee circumstances in which disconnecting consumers in case of non-payment may be restricted. Since disconnections are in strong contrast to the right to be supplied with energy once connected to the grid, consumers may be disconnected only when a) there is a good reason; b) they have been adequately informed about the intended disconnection in advance; and c) they have also been informed about ways to prevent a scheduled disconnection. While the aforementioned Directives specify that a prohibition to disconnect a consumer may be an adequate means to secure the energy supply of vulnerable customers at critical times, there is no further detailed explanation regarding the circumstances in which disconnections may be an appropriate action for energy service providers to take.

- 496 Here the minimum notice (and procedural) period to disconnect a consumer from both a legal and practical perspective is assessed by exploring the minimum number of days from the non-payment of a bill or monthly instalment on its due date to the date of disconnection (days for delivery of mail or notice were been counted, and any action on behalf of energy companies was assumed to be immediate). It should be noted that many MSs have difficulties determining the precise duration of the disconnection process. Therefore, the data available here should be considered with some caution; most NRAs provided their best estimates of the actual (in practice) duration of the process.
- 497 Table 7 illustrates the considerable legal differences between countries in terms of disconnection periods; for approximately half of the countries, the same disconnection period applies for electricity and gas within the same MS. For instance, while the disconnection process must take at least 200 days in Flanders (Belgium), consumers may be disconnected in less than a month in several countries, including Austria, Bulgaria, Cyprus, Great Britain, Italy, Lithuania, Portugal, Slovakia and Slovenia. In Estonia, the duration of the disconnection process is considerably extended in cases of vulnerability, e.g. from 15 to 90 days. In Norway and the Netherlands, self-binding agreements establish a certain minimum duration which is not legally enforceable. In some countries, different process durations apply for electricity and gas disconnections, with the most marked example being Greece, with a 70-day notice period for electricity and 15 for gas.

Table 7: Minimum duration (in days) for the disconnection process for non-paying consumers across MSs in both electricity and gas

Duration of disconnection process in case of non-payment (in days)		
Country	Legal	In practice
Austria	29	more than 29
Belgium	~ 200 (Flanders), 65 (Wallonia), 57 (Brussels)	-
Bulgaria	10 ¹ / 20 ²	more than 10 ¹ / 20 ²
Croatia	60 ¹	60 ¹
Cyprus	23 ¹	23 ¹
Denmark	Not specified in law ¹	90
Estonia	15 or 90 ¹ / 7 or 45 ²	15 or 90 ¹ / - ²
Finland	35	35 ¹ / - ²
France	35	45
Germany	31	more than 31
Great Britain	28	80
Greece	70 ¹ / 15 ²	70 ¹ / 15 ²
Hungary	60	-
Ireland	*	*
Italy	23	more than 23
Latvia	30 ¹	more than 30 ¹
Lithuania	15	15
Luxembourg	60	-
Netherlands	**	60
Norway	** ¹	63 ¹
Poland	44	50
Portugal	20	20
Romania	45	45
Slovakia	10	10
Slovenia	23 ¹ / 15 ²	-
Spain	104 ¹ / 60 ²	-
Sweden	35 ¹ / 40 ²	-

Source: CEER Database, National Indicators (2014)

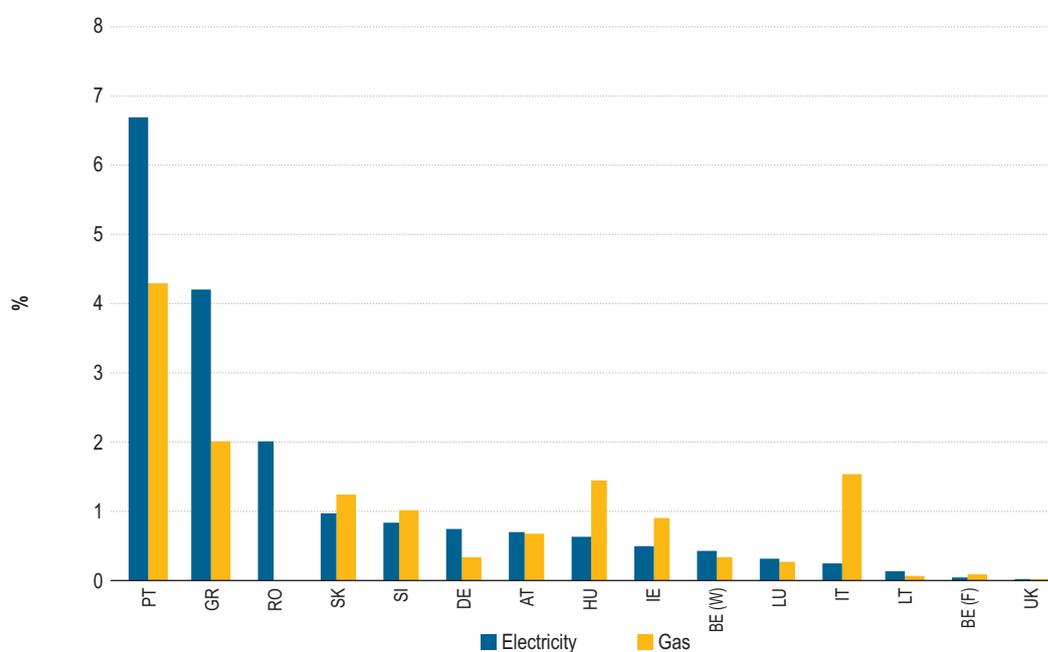
Notes: ¹ electricity; ² gas; – not available; * although no days are mentioned, there is a complex procedure in place which suggests a duration of 30 days or longer; ** self-binding agreements in industry, not legally enforceable.

Question: How many days (at least) does it take to disconnect a final household customer from the grid because of non-payment in your country?

498 Since energy service providers also have different policies concerning disconnections, which are not always made transparent, the actual duration of a disconnection may take considerably longer in a number of MSs. For instance, actual disconnection may take (significantly) longer than legally required in Austria, France, Germany and Great Britain. However, some NRAs also point to a lack of data on the exact duration in practice.

499 Finally, Figure 86 illustrates the share of consumers disconnected due to non-payment of bills in countries where data on disconnections are available. As can be observed, only half of the MSs' NRAs are unable to provide information on the number of disconnections in electricity and gas, despite their monitoring duty mentioned in both the Electricity and Gas Directives (Articles 37 para 1 (j) and 41 para 1 (j) respectively). Disconnection rates are lowest in Great Britain (<0.1%) which in part reflects a policy favouring the installation of prepayment meters over disconnections in cases of non-payment, and strong non-disconnection protections for vulnerable consumers. Meanwhile, disconnections reach up to 6.7% of all electricity metering points for Portuguese households in 2013. While disconnection rates are below 1% in Great Britain, Luxembourg, Austria, Ireland and Slovenia, they rise above 4% in Greece (in electricity only) and Portugal.

Figure 86: Share of disconnections due to non-payment in % of household consumer metering points – 2013



Source: CEER Database, National Indicators (2014)

Notes: figures from electricity disconnections in Austria are estimates; the figures for Slovakia include other reasons for disconnection. BE(W)=Wallonia in Belgium; BE(F)=Flanders in Belgium. MSs not shown in the figure were either unable to provide any data or do not (yet) know the number of disconnections in 2013.

500 To conclude, the consumer provisions from the 3rd Package covering SoLR and restrictions on disconnections from the grid have been widely implemented in national legislation. While SoLR mechanisms have been established in almost all countries, there are considerable differences in their functions across MSs. The main function of current SoLR provisions can be seen in the takeover of supply in case of supplier failure. However, numerous MSs also foresee a SoLR to support economically weaker consumers, as well as inactive consumers, although this is labelled default supply in some countries. Having said that, it should be noted that customer supports may fall under a MS's broader (than energy) social protection and social security mechanisms rather than specific provisions within the energy market; such as those provided by the Supplier of Last Resort or default supplier.

- 501 As for disconnections, up to 6.7% of Portuguese electricity customers were disconnected in 2013. While the disconnection rates are considerably lower in other countries, no systematic differences in the disconnection rates between electricity and gas were detectable in the countries examined. Despite a monitoring duty of disconnection rates in the 3rd Package, only 13 NRAs were able to provide information on disconnection rates.
- 502 Most MSs have specified a legal minimum duration for the disconnection process for non-paying consumers. This period varies considerably across MSs, ranging from 10 to 200 days based on (estimated) data submitted by NRAs. However, there is considerably less information available on the actual duration of disconnection processes, as energy service providers exercise some liberty in deciding whether or not to disconnect their customers in the first place. Here, NRAs are less informed about the practicalities of disconnections, which may also vary within countries because of different company policies. Nevertheless, available figures indicate that the actual duration of a typical disconnection due to non-payment may be considerably longer than legally required.

5.2.2 Vulnerable consumers

- 503 According to Article 3 of the Directives³⁴², MSs must ensure that there are adequate safeguards in place to protect vulnerable customers. In this context, each country must define the concept of a vulnerable customer, which may refer to energy poverty and, *inter alia*, to the prohibition of disconnection of electricity and/or gas supply to such consumers at critical times.
- 504 The concept of vulnerable customers refers to important information with respect to protected groups of consumers and specific protections. When assessing consumer protection under the lens of vulnerability, a first step is to gauge the various systems of protection of (vulnerable) consumers across MSs. However, given the various approaches to social security and other protection mechanisms across MSs, the interpretation of what it means to “define the concept of vulnerable customers” has taken different forms. On the one hand, MSs may define the concept in explicit terms, that is, the legal and/or regulatory frameworks clearly state the criteria of vulnerability. Existing definitions may rely on personal characteristics to differentiate vulnerable consumers from others, such as age, health, disability status and so on. In other cases, an explicit definition of vulnerable consumers may refer to specific situations, such as unemployment, times of economic crisis and so on.
- 505 On the other hand, existing legal and/or regulatory frameworks may protect such consumers in different ways, even without specifying vulnerability in more detail. Importantly, MSs may argue that their existing energy-specific, social or other protection mechanisms already protect these groups of consumers as intended in the aforementioned Directives. In such cases, the concept of vulnerable customers may be described as inherent to, or implicit in, existing social protection and social security mechanisms in a given country. For instance, in Austria or Germany a series of more general social security measures protect specific groups of citizens, also covering their energy affairs, even without using the terminology of vulnerability.
- 506 Results indicate that in 13 out of 26 MSs for which data are available, the concept of vulnerable consumers is explicitly defined; in another 12 countries, vulnerable consumers are defined implicitly. Only two NRAs (Latvia and Norway) state that a definition of vulnerable consumers is not (yet) available in their country.

342 Directives 2009/72/EC and 2009/73/EC.

507 While the vast majority of MSs have defined the concept of vulnerable customers, MSs might take different approaches to protecting these groups of consumers. Therefore, a closer look at specific protection mechanisms is needed to grasp the kind of support available to these consumers. The measures implemented most often to protect vulnerable consumers are restrictions to disconnection due to non-payment. Such a protection mechanism is in place in 16 out of 23 MSs (electricity) and 11 out of 21 MSs (gas). Other popular means to support vulnerable consumers throughout Europe are special energy prices (aka social tariffs) and earmarked social benefits to cover energy costs. Support mechanisms such as a certain amount of free energy or exemptions from specific cost components of energy are rare. While national suppliers may offer some types of repayment plan (i.e. deferred payment), a consumer's right to deferred payment is also not widespread across MSs.

Table 8: Measures to protect vulnerable customers in the EU – 2013

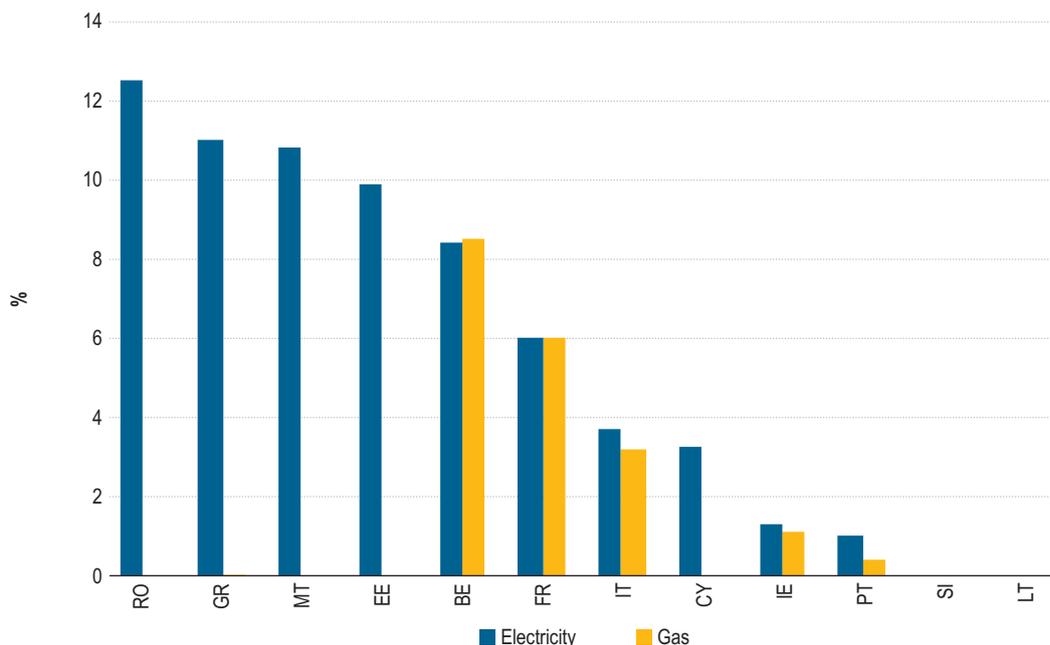
	# Countries Electricity	# Countries Gas
A. Restrictions on disconnection due to non-payment	16	11
B. Earmarked social benefits to cover (unpaid) energy expenses	9	7
C. Special energy prices for vulnerable customers (also known as social tariffs)	8	5
D. Additional social benefits to cover (unpaid) energy expenses (non-earmarked financial means)	4	5
E. Free energy-saving advice to vulnerable customers	3	3
F. Right to deferred payment	2	3
G. Exemption from some components of final customer energy costs (e.g. energy price, network tariffs, taxes, levies...)	2	2
H. Financial grants for the replacement of inefficient appliances	2	2
I. Free basic supply of energy	1	1
J. Replacement of inefficient basic appliances at no cost to vulnerable households	1	1
K. Other	5	9

Source: CEER Database, National Indicators (2014)

Notes: 26 jurisdictions covered. Question: "What are the specific safeguards to protect vulnerable customers to ensure their necessary energy supply in your country?"

508 While Table 8 shows a diversity of approaches to how vulnerable consumers are protected, any comparison between MSs on these protections must also take into account substantial differences in the meaning of vulnerability. Nevertheless, a closer examination of the prevalence of vulnerability, that is, the number of vulnerable consumers in a country, gives a first impression about this kind of protection offered in the energy sector. While MSs with implicit definitions often report being unable to "count" these groups of vulnerable consumers, countries with explicit definitions of vulnerable groups of consumers mention fewer difficulties in reporting. Figure 87 illustrates data for 12 MSs (electricity) and 6 MSs (gas) which were able to report on the number of vulnerable consumers in their country. While shares of vulnerable consumers are close to zero in Slovenia and Lithuania (and Greece for gas only), the percentages of vulnerable electricity consumers in Romania, Greece and Malta are higher than 10%. However, due to the vast differences in the definition of the concept of vulnerable customers, national differences in the social security system, varying benefits in the energy sector and/or economic conditions at the time, the reported numbers of vulnerable consumers are of very limited comparability. For these reasons, therefore, it is not possible to draw any cross-country comparisons from this data.

Figure 87: Share of vulnerable customers in a selection of MSs – 2013 (in % of household consumer metering points)



Source: CEER Database, National Indicators (2014)

509 To conclude, the concept of vulnerable consumers has been transposed into national laws in different ways. Some MSs opt for an explicit definition and identify specific groups of consumers or consumers in specific situations as vulnerable. Other MSs choose to define the concept of vulnerable consumers implicitly in their energy or social security laws. Nevertheless, most MSs report a number of protection means covering the energy sector, e.g. restrictions on the disconnection of vulnerable consumers, or social benefits to cover energy expenses. These national differences lead to limitations in the comparability of the number of vulnerable consumers across MSs.

5.2.3 Customer information

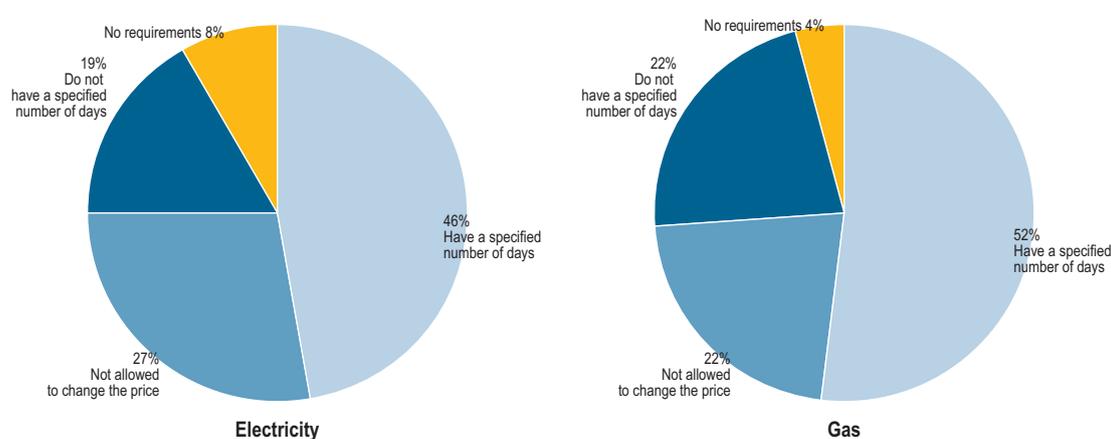
510 The Electricity and Gas Directives³⁴³ consider the information provided to customers as the most important factor in customer protection and empowerment. Having the right information at one's disposal can make a difference to one's ability to exercise one's rights and actively participate in the energy market.

511 Here, both the legal and practical perspective in MSs concerning customer information provisions in the Directives are considered; this demonstrates the level of consumer protection in different MSs as a result of providing consumers with quick, transparent and accurate information. In order to identify good practices which exceed the minimum requirements, an overview of all issues covered under the consumer information umbrella will be presented.

343 Directives 2009/72/EC and 2009/73/EC.

512 First, the provision of information on price changes and other components of the bill varies among MSs. As shown in Figure 88, the legal requirement to inform household (end) consumers about energy price changes in fixed-price contracts³⁴⁴ does not include a specific notice period (number of days) in Austria, Bulgaria, Poland and Portugal for either electricity or gas; this is also the case in Malta (for electricity) and Sweden (for gas). In Estonia and Sweden, an electricity supplier is not allowed to change the price in a fixed-price contract; while in Finland, Germany, Great Britain, Slovenia, and the Netherlands, suppliers are not allowed to change a fixed price for electricity or gas. In Hungary and Norway, there are no legal requirements for fixed-price contracts.

Figure 88: Legal requirements for information to consumers about price changes for fixed-price contracts – 2013 (% of jurisdictions)



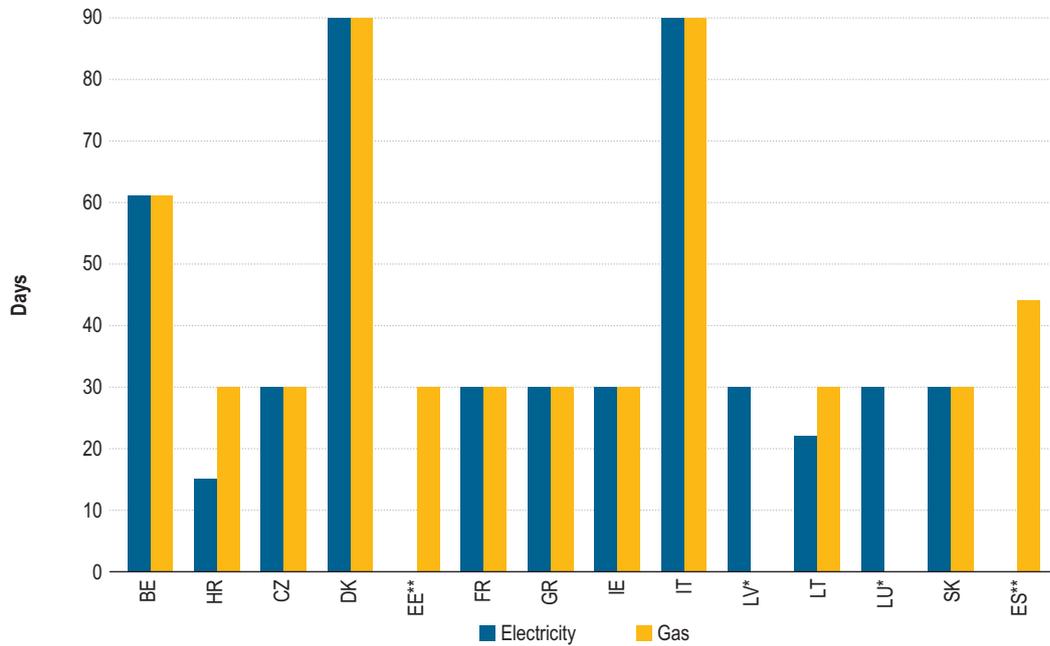
Source: CEER Database, National Indicators (2014)

Note: Data for electricity from 26 jurisdictions, data for gas from 23 jurisdictions.

513 In 14 countries, legal requirements specify that consumers must be informed about energy price changes in a fixed-price contract a specific number of days in advance of the change. The legal requirement for information on fixed-price contracts varies between 15 and 90 days for these countries. Figure 89 depicts this variation in the different countries according to national law. In practice, the timeframe in number of days does not differ, which means that the legal requirements are de facto applied.

344 A fixed-price contract refers to any contract in which energy price changes are not foreseeable by the supplier for the whole or unlimited duration of the contract. In contrast, variable-price contracts are contracts which explicitly bind the final household customer energy price component to an explicit pricing mechanism and is changed on a regular basis, e.g. an indexed wholesale energy price or indexed to regulated prices.

Figure 89: Number of days in advance that household consumers are informed about energy price changes – fixed-price contracts (legal perspective) – 2013 (days)



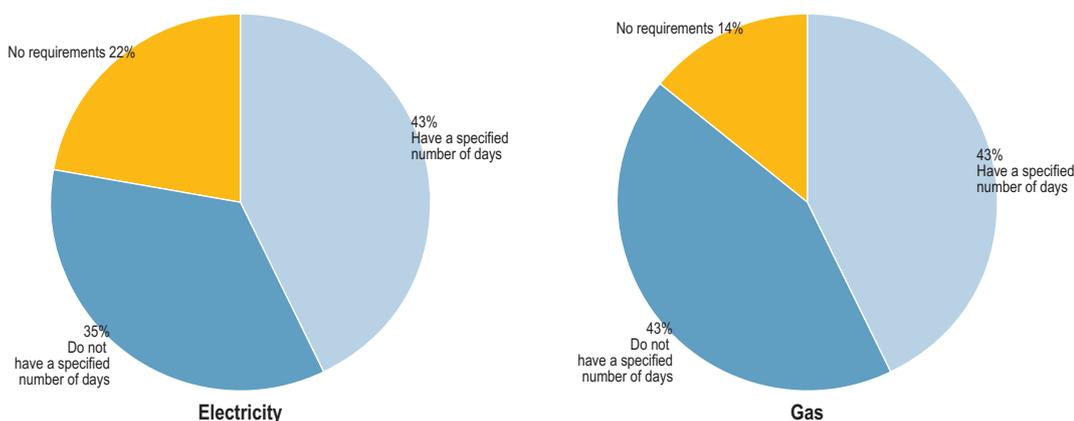
Source: CEER Database, National Indicators (2014)

Notes: * only for electricity; ** only for gas.

514 The legal requirement to inform household consumers about energy price changes in variable-price contracts does not include a specific notice period (number of days) in Austria, Belgium, Germany, Italy, the Netherlands, Poland³⁴⁵ and Portugal (for both electricity and gas), or in Malta (for electricity) or Romania and Slovenia (for gas). There are no legal requirements for variable-price contracts for either electricity or gas in Greece, Hungary and Sweden, and no legal requirements for electricity in Estonia and Norway.

345 In Poland, the notice period is specified by the settlement period.

Figure 90: Legal requirements for information to consumers about price changes for variable-price contracts – 2013 (% of jurisdictions)

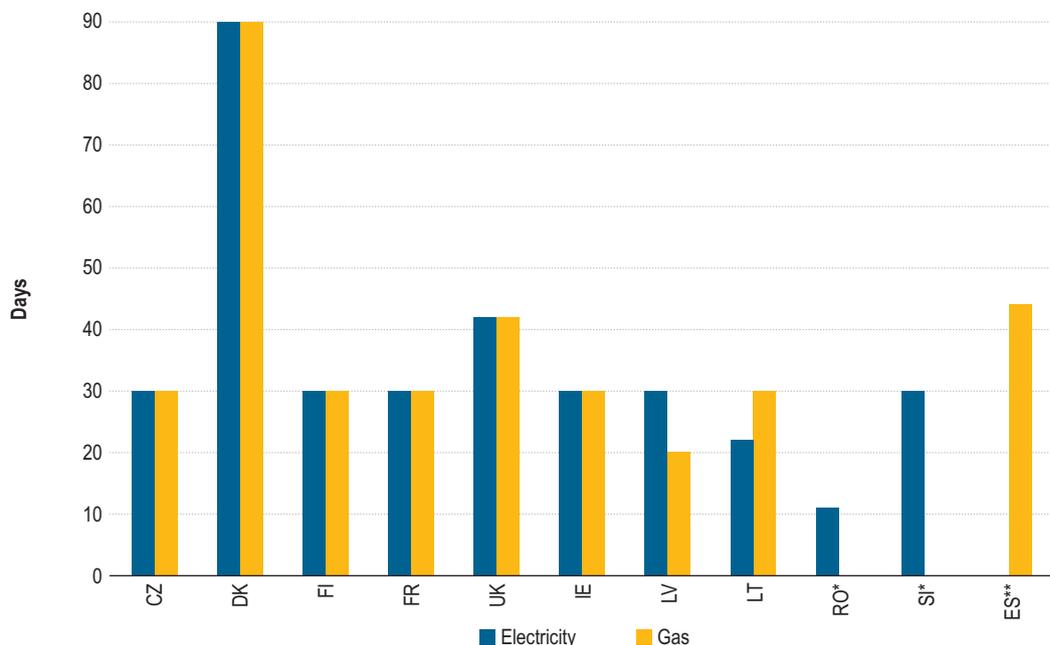


Source: CEER Database, National Indicators (2014)

Note: Data on electricity from 23 jurisdictions, data on gas from 21 jurisdictions.

515 In 11 countries, legal requirements specify that consumers must be informed about energy price changes in a variable-price contract a specific number of days in advance of the change (see Figure 91). The legal requirement for information on variable-price contracts varies between 11 and 90 days for different MSs. Figure 91 depicts this variation in the different countries according to national law. In practice, the results mirror the legal requirements for all MSs except Romania, where customers are informed less than 10 days in advance regarding energy price changes, compared to the 11 days required by law. In both Austria and Norway, customers are informed about price changes 14 days in advance in practice, although this is not required by national law.

Figure 91: Number of days in advance that household consumers are informed about energy price changes – variable-price contracts (legal perspective)



Source: CEER Database, National Indicators (2014)

Notes: * only for electricity; ** only for gas.

516 The data regarding consumer information on energy price changes allows for interesting comparisons with the data regarding information to consumers on changes in the other components of energy costs, such as network tariffs and taxes, etc. In 26 out of 28 countries, NRAs stated that there are legal requirements to provide consumers with information about these changes; Austria and Great Britain are the two countries with no such legal requirement³⁴⁶ In practice, consumers in all MSs are provided with information about changes in other components of the bill; with the exception of Austria and Ireland (where the law is not applied). In Great Britain, this information is often provided to consumers in practice, although this is not required by law.

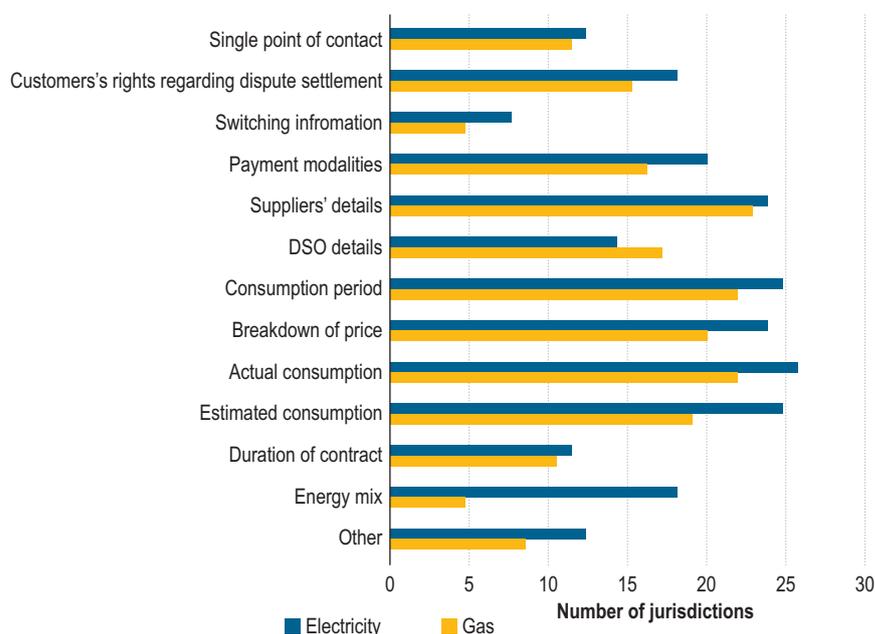
517 Consumers in almost all countries can find various items of information on their bills, such as information about the single point of contact, means of dispute settlement, switching, payment modalities, supplier and DSO contact details, actual and estimated consumption, the breakdown of prices, the energy mix, and the duration of the contract.

518 As can be seen from Figure 92, in some countries there is a lack of information on bills regarding consumer rights (i.e. the single point of contact) and empowerment (through switching information and the duration of the contract). In Great Britain, the regulatory authority Ofgem introduced new licence obligations for suppliers to also show information on the cheapest tariffs they offer and the tariff comparison rate³⁴⁷ on consumers' bills. In the Netherlands, consumers can choose from two types of bill: a simple or extended one.

346 In Great Britain, all price changes are communicated as indicated in the previous paragraphs, since network costs and taxes are included in the retail price.

347 In Great Britain, all energy suppliers are obliged to publish a Tariff Comparison Rate for gas (TCR) for every tariff offered. The TCR is supposed to assist customers in comparing one tariff with another on a cost-per-kWh basis. It assumes typical consumption for a household and includes unit rates (energy price), standing charges and any applicable discounts. Hence, the TCR is not an actual price and not based on personal consumption.

Figure 92: Information on consumer bills – 2013 (number of jurisdictions)



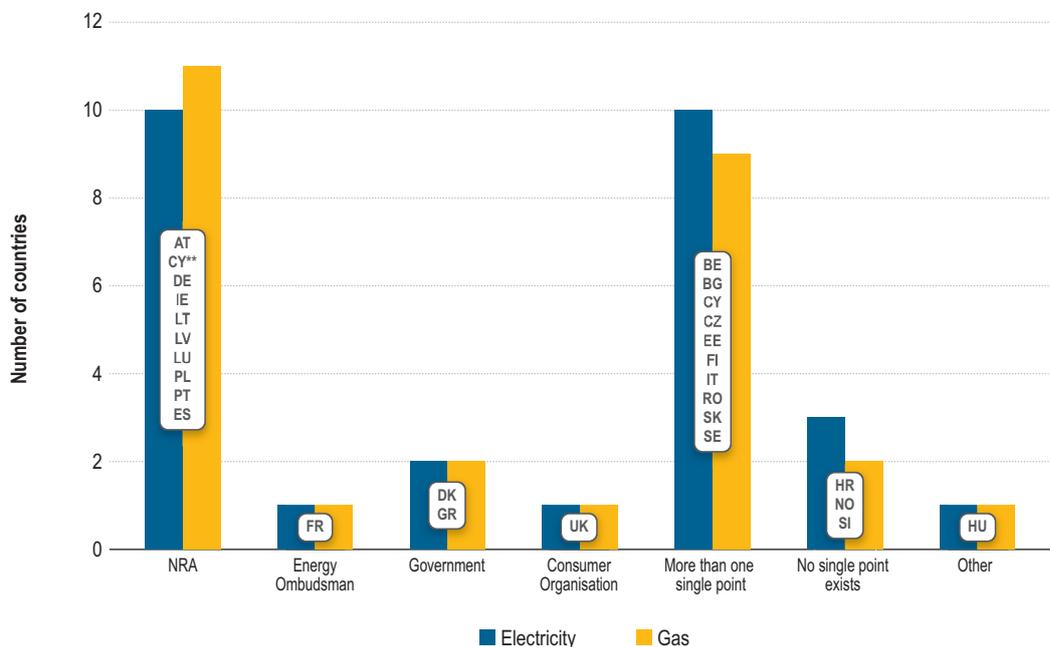
Source: CEER Database, National Indicators (2014)

Note: 29 jurisdictions have provided data for electricity, while 27 jurisdictions have provided data for gas.

519 MSs must establish a single point of contact which consumers can contact in order to obtain independent information about their rights and the market. Almost all of the respondent countries mention that they have such a service in place. Only Croatia, Norway and Slovenia note that there is still no single point of contact. In 10 out of 28 countries, this role for electricity falls within the responsibilities of the NRA. The NRA is the single point of contact for gas in 11 out of 27 countries. In France, the role is taken by the Energy Ombudsman in coordination with the NRA and the Government; while in Denmark³⁴⁸ and Greece, it is the government, and in Great Britain, a consumer organisation. Hungary reported that the single point of contact is another body, without giving further details. In some countries, namely Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Italy, Romania, the Slovak Republic and Sweden, the single point of contact role for both electricity and gas is shared between two or three bodies. In Cyprus, the role of single point of contact for gas is shared between the NRA and the Government.

348 The Energy Suppliers Complaint Board in Denmark is a government institution established in co-operation with the Consumer Council and the industry.

Figure 93: Single point of contact – 2013 (number of countries)



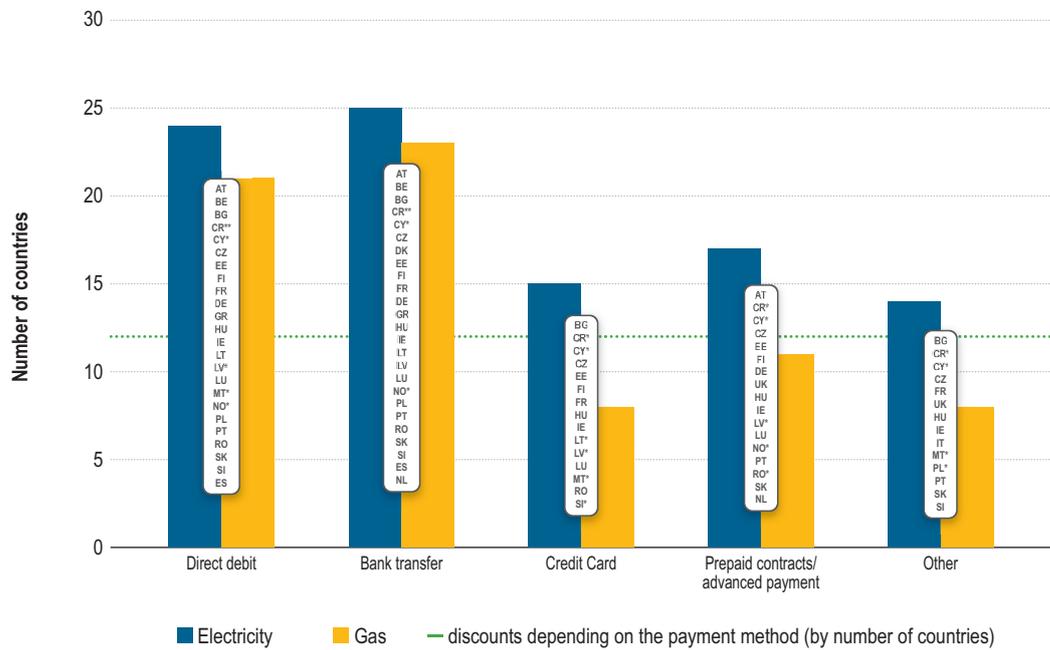
Source: CEER Database, National Indicators (2014)

Note: * only for electricity.

- 520 The European Commission has called upon MSs to make available a consumer checklist or handbook of practical information related to energy consumer rights. In 14 out of 26 countries, such a consumer checklist exists and falls under the responsibility of the NRA. Few countries stated that there is no national legal requirement to have such a document. Other NRAs compare it to the single point of contact information. A third set of countries stated that the information contained in this kind of checklist can be found in several brochures/documents or websites, but not in one single document.
- 521 Finally, the Electricity and Gas Directives³⁴⁹ require a variety of payment methods be made available to energy consumers. According to the data received and displayed in Figure 94, consumers in all MSs can choose from at least two different payment methods (for electricity). In 12 out of 25 countries, suppliers offer discounts or rebates according to the type of payment method.

349 Directives 2009/72/EC and 2009/73/EC.

Figure 94: Choice of payment methods – 2013 (number of countries)



Source: CEER Database, National Indicators (2014)

Notes: * only for electricity; ** only for gas.

5.2.4 Supplier switching

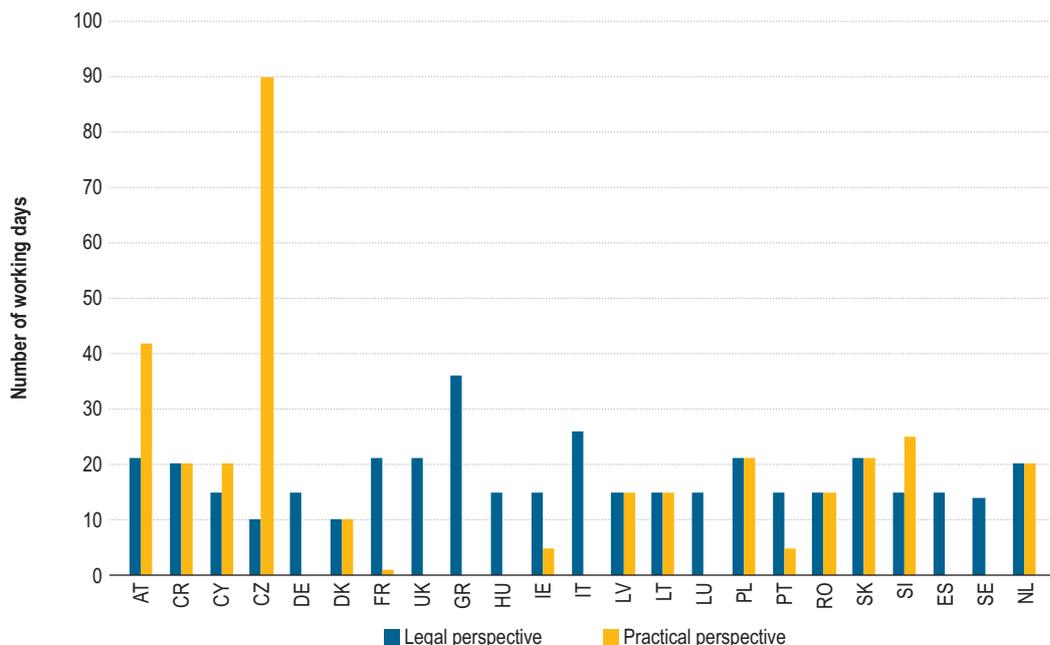
522 Supplier switching offers consumers the most direct way to benefit from the market. Switching behaviour impacts highly on the level of competition development, because, in general, if customers are well informed about their switching rights and the benefits they can obtain, the more attractive the market will be to new potential retailers with competitive offers. The possibility for consumers to exercise this power (to switch) should place competitive pressure on suppliers to deliver the best services at the best prices. According to the Directives³⁵⁰, switching should be done within a period of three weeks, and the consumer should receive their final bill from their previous supplier within six weeks.

523 Regarding customer information, the goal is to show what MSs are able to protect customers. Again, some good practices will be presented to show that some MSs have gone beyond the provisions in the Directives and offer consumers the rights they deserve in terms of supplier switching.

524 Figure 95 is a first illustration of how some MSs out-perform the provisions in the aforementioned Directives regarding the switching period. The figure shows that MSs are working towards better services and protection for consumers, which may encourage them to participate more actively in the market by giving them an opportunity, in this case, to change supplier rapidly and thereby contribute to the better development of the market and competition. In electricity, the three-week period required by the aforementioned Directives is met everywhere in Europe. In Austria, although the Directive is transposed into national law, switching in 2013 could take up to 42 days in practice (as roughly estimated by the Austrian NRA). On the other hand, several countries perform the switching process more quickly in practice than required by law, such as Ireland and Portugal, where switching is done within five days. In France, it is possible to change supplier in one day. In the case of Belgium, the supplier switching changes depending on the region (Flanders: 15 working days by law and 34 days

in practice; Brussels: 21 working days by law, no information on the practical situation; Wallonia: 30 working days by law and 36 in practice).

Figure 95: Supplier switching in electricity – 2013 (number of working days)



Source: CEER Database, National Indicators (2014)

- 525 To better understand these results, it is important to know the exact starting point of the switching period. The most common response to this is when the supplier transfers the customer data to the DSO. Although this is the case in Austria and France, the switching periods are different in these two countries. In a few countries, the switching period starts on the first day of the month after a customer’s request; in Great Britain and the Netherlands, a “cooling off” period is taken into account in addition to the legally specified duration of a switch.

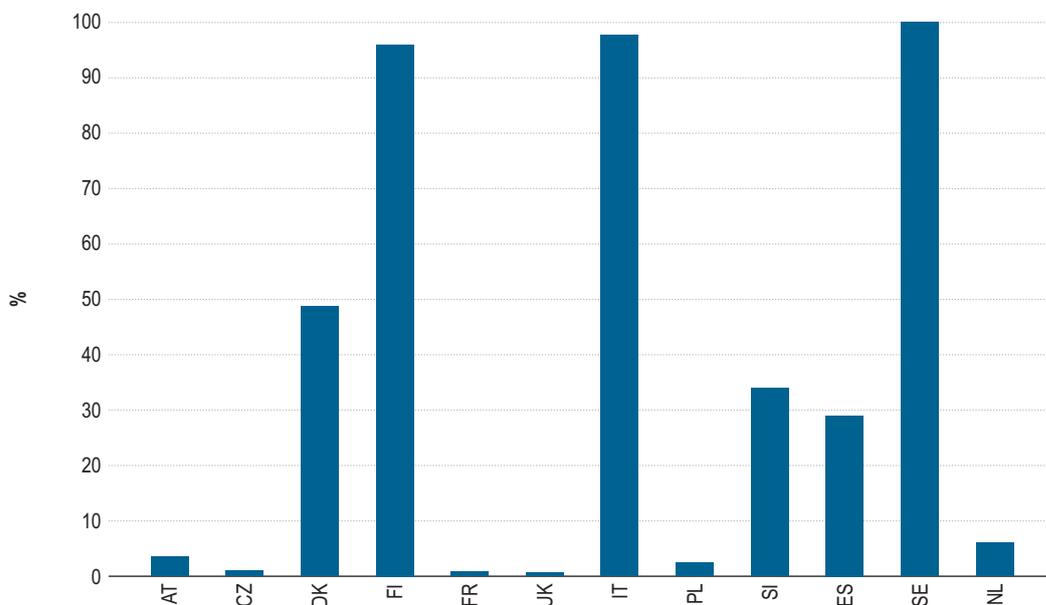
- 526 In the majority of countries, by law as well as in practice, consumers receive their final bill within six weeks, as required in the 3rd Package. However, a few countries have a shorter period, such as Bulgaria and the Czech Republic, where customers receive their final bill within two weeks, in Hungary and Lithuania (three weeks) and France and the Slovak Republic (four weeks).

- 527 Reasons vary across MSs as to why the switching process to a different supplier can be stopped. The most common is unpaid bills with the current supplier, but it could also be because of unpaid bills with the DSO in countries where consumers receive two separate bills, one from the supplier and one from the DSO, or because the metering point does not exist or the data is erroneous.

5.2.5 Metering

528 According to Annex I of the Electricity Directive 2009/72/EC, MSs should roll-out electricity smart meters to 80% of consumers by 2020, unless the result of a CBA is negative. For the gas sector, Annex I of the Gas Directive 2009/73/EC requires MSs to prepare a timetable for the roll-out of gas smart meters based on a CBA (with no indication of a timeline). At the moment, three countries have finalised their roll-out for electricity smart meters (Finland, Italy and Sweden) and a further three MSs have a significant share of smart meters already installed (Denmark, Slovenia and Spain). In the gas sector, the roll-out process is significantly less advanced. Only in four MSs (Denmark, Great Britain, Italy and the Netherlands) has the gas smart meter roll-out begun. Available data shows that the level of roll-out is generally lower, with 0.47% of gas household customers with smart meters in Great Britain, 0.2% in Italy and 6% in the Netherlands.

Figure 96: Share of households with smart meters – 2013 (%)

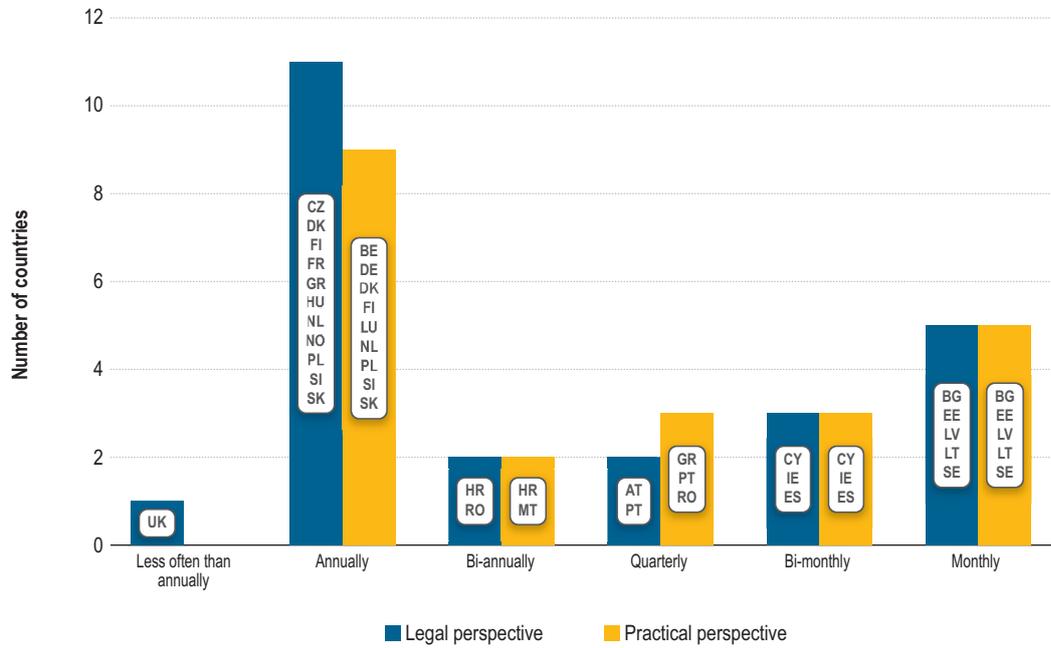


Source: CEER Database, National Indicators (2014)

529 In those MSs with full or partial deployment of electricity smart meters, the most common requirements from which consumers can benefit when smart meters are installed are: information on actual consumption, access to information of consumption on consumers' demand, remote power capacity reduction/increase, consumer control of metering data, bills based on actual consumption and interface with the home.

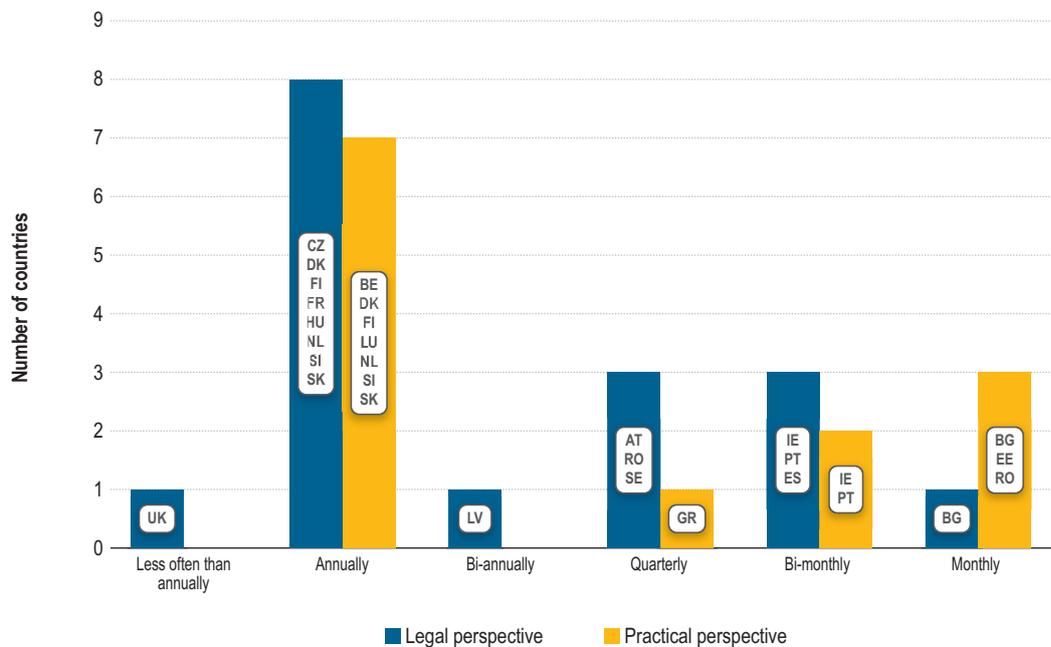
530 Figure 97 to Figure 100 present the frequency of (billing) information on (actual) consumption in households where smart meters are not yet in place. According to these results, most consumers in different MSs receive information on consumption for both electricity and gas on an annual basis. A few countries stated that there are some differences in the frequencies from a legal and practical perspective. For instance, in Great Britain, although the law sets the frequency at one year, in practice this depends on the supplier. In Austria, consumers should receive billing information following a self-reading, to which they are entitled every three months. However, DSOs are obliged to actually read their meters only every three years. Hence, inactive consumers receive information about their actual consumption less than once a year.

Figure 97: Frequency of billing information based on actual electricity consumption – 2013 (number of countries)



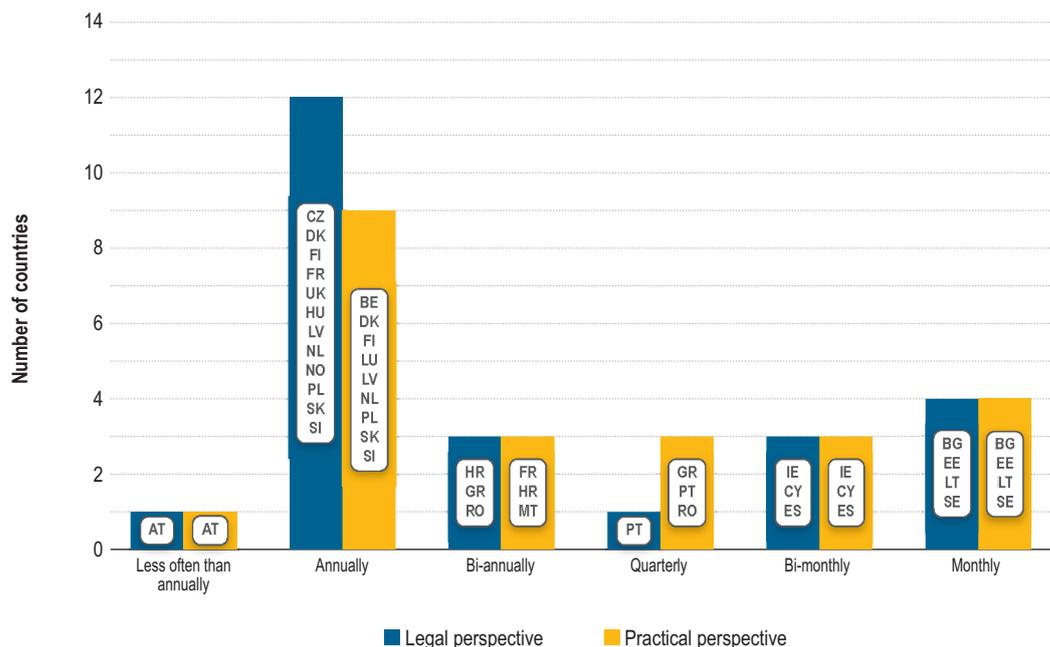
Source: CEER Database, National Indicators (2014)

Figure 98: Frequency of billing information based on actual gas consumption – 2013 (number of countries)



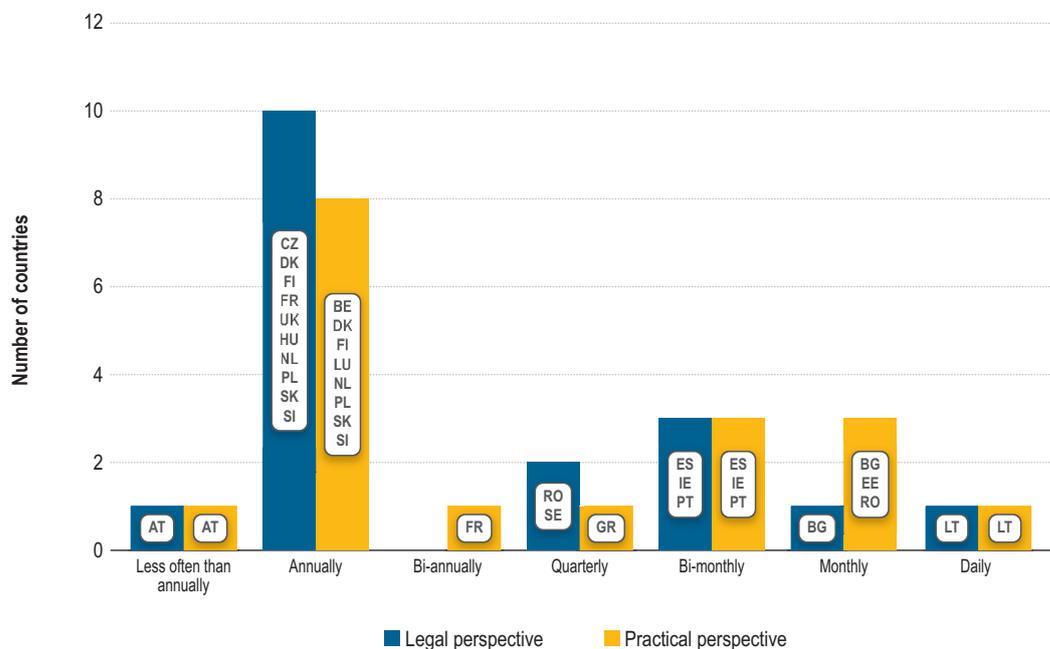
Source: CEER Database, National Indicators (2014)

Figure 99: Frequency of receipt of information on actual electricity consumption – 2013 (number of countries)



Source: CEER Database, National Indicators (2014)

Figure 100: Frequency of receipt of information on actual gas consumption – 2013 (number of countries)



Source: CEER Database, National Indicators (2014)

5.3 Consumer complaints

- 531 Directives 2009/72/EC and 2009/73/EC state that NRAs have a duty, *inter alia*, to monitor complaints made by consumers. Where an MS has assigned monitoring duties to another authority, the information resulting from such monitoring must be made available to the NRA as soon as possible.
- 532 In 2010³⁵¹, European energy regulators recommended the inclusion of the number of consumer complaints by category as an indicator of consumer (dis)satisfaction when monitoring retail energy markets. Moreover, it is suggested that data is to be collected at least annually from DSOs, suppliers and third-party bodies, depending on which sources are considered the most suitable.
- 533 There are significant differences in how Member States define complaints. There are also differences in European NRAs' methods of data collection, depending on whether the authority is responsible for collecting data directly or via third parties. Nevertheless, sound consumer protection must be based on an effective means of dispute settlement for all consumers, and on speedy and effective procedures for handling complaints.
- 534 It appears that all MSs collect data on consumer complaints. The number of, and reasons for, reported complaints can help detect supplier problems or market dysfunctions and assess the degree of consumer satisfaction.

5.3.1 Complaint data

- 535 In 2013, almost all NRAs provided data on the number of household consumer complaints received by the NRA (or the ADR, in cases where the NRA does not handle complaints and forwards the complaints directly to the ADR). However, only a minority of NRAs provided data on the number of household consumer complaints received by suppliers and/or DSOs. This suggests that the requirement of Article 37 of the Electricity Directive 2009/72/EC and Article 41 of the Gas Directive 2009/73/EC, i.e. "the regulatory authority shall have the following duties: (j) monitoring the level and effectiveness of market opening and competition at wholesale and retail levels, including (...) complaints by household customers", might be implemented differently across MSs.
- 536 Table 9 presents the number of household (end) consumer complaints per 100,000 inhabitants, received by different bodies and reported to the NRAs. In most of the countries, the data on the number of complaints cannot be separated for electricity and gas. Therefore, Table 9 shows combined data for both types of energy.

351 Source: ERGEG (2010): GGP on Customer Complaint Handling, Reporting and Classification. http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab1/E10-CEM-33-05_GGP-ComplaintHandling_10-Jun-2010.pdf.

Table 9: Number of final household customer complaints for both electricity and gas – 2013

COUNTRY	Complaints received by suppliers per 100,000 inhabitants	Complaints received by DSOs per 100,000 inhabitants	Complaints received by ADR per 100,000 inhabitants	Complaints received by NRA per 100,000 inhabitants
Austria	253.2	15.9	36.3**	36.3**
Belgium*	49	357	-	11.9
Bulgaria	3.9	3.9	-	0.6
Croatia	-	-	-	-
Cyprus	79	4.4	3.9**	3.9**
Czech Republic	-	-	77.2	38.1
Denmark	-	-	-	-
Estonia	-	-	-	0.5
Finland	-	-	-	-
France	-	-	24	0
Germany	-	-	11.9	21.7
Great Britain	8,731.2	63.3	19	0
Greece	100.4	27.1	1.7	1.2
Hungary	79.1	41.5	-	53
Ireland	-	-	14.1**	14.1**
Italy	632	-	-	67
Latvia	-	32.8	-	3.9
Lithuania	24.8	24.8	0.6	1.6
Luxembourg	-	-	0.6	-
Malta	-	11,888.6	-	-
Netherlands	-	-	-	27.9
Norway	-	-	5.3	0.4
Poland	-	-	-	4
Portugal	481.9	529.3	-	47.2
Romania	-	386.1	-	12.4
Slovakia	494.5	212.4	-	19.8
Slovenia	603.2	161.6	0.3	1
Spain	-	-	-	5.7
Sweden	-	-	0.7	1.5

Source: CEER Database, National Indicators (2014)

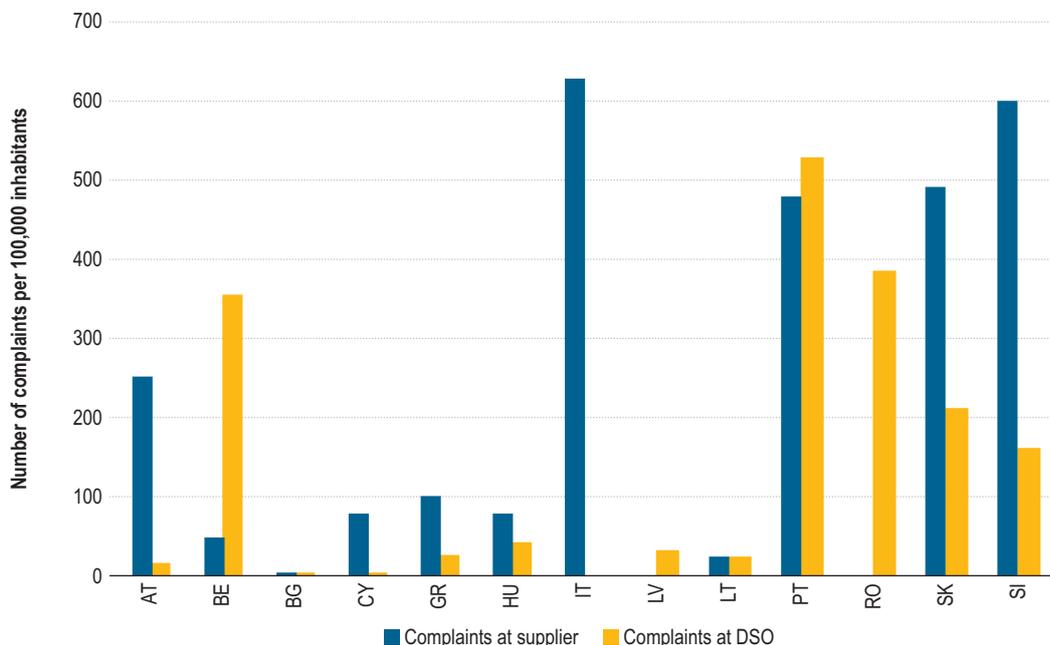
Notes:

*In the case of Belgium, information was provided by region. For the regions of Flanders and Brussels, no data are available on complaints received by suppliers. For the region of Brussels, no data are available on complaints received by DSOs. No data are available on the complaints received by the alternative dispute resolution body (ADR) for any Belgian region.

** Figures are the same for complaints received by ADR and NRA as NRA is the ADR body in these countries.

537 As shown in Figure 101, reported figures on complaints fall in the range of 100 to 600 household consumer complaints per 100,000 inhabitants in most of the countries for which data are available (see already Table 9). The exceptions are Bulgaria, Latvia and Lithuania, where the figures are much lower. In the case of Bulgaria, a low number of household customer complaints coincided with major financial difficulties in 2013, which were accompanied by public demonstrations. This raises some questions regarding the comprehensiveness of complains and/or the robustness of the reporting.

Figure 101: Number of customer complaints to suppliers and DSOs per 100,000 inhabitants for a section of countries – 2013

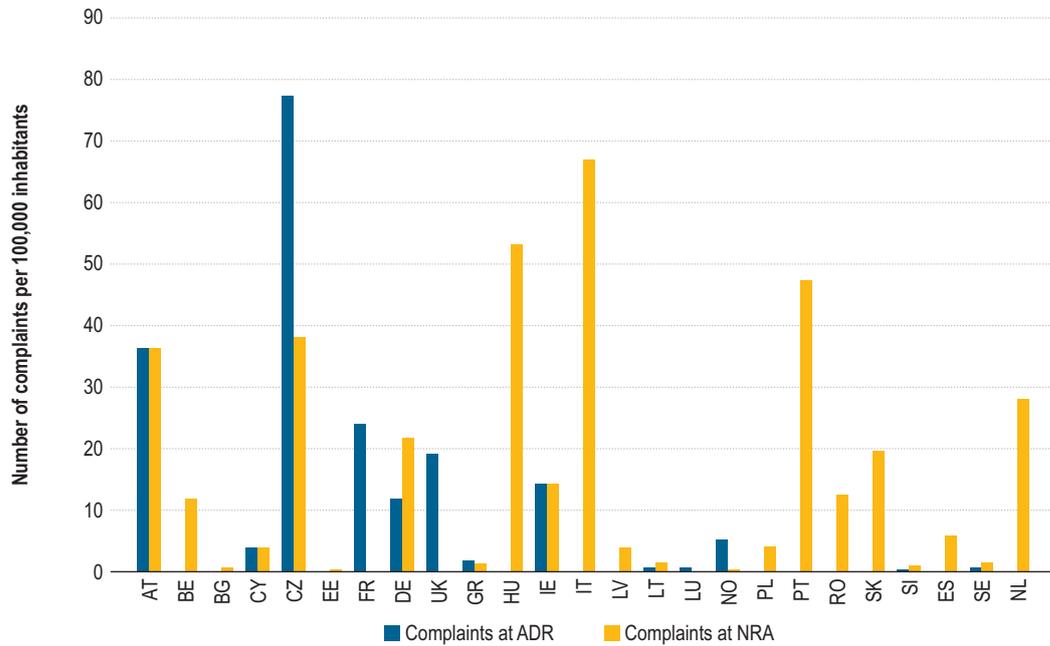


Source: CEER Database, National Indicators (2014)

- 538 As shown in Table 9, the numbers of consumer complaints are significantly higher in two countries (Great Britain and Malta). This finding might further suggest a more comprehensive and/or robust reporting system in both countries³⁵².
- 539 Only a minority of NRAs were able to report data from their national alternative dispute resolution (ADR) body (see Figure 102). However, all NRAs stated that there is an ADR in their country. In countries where data is available, the number of household consumer complaints received by ADRs varies significantly. Some NRAs did not provide figures and explained that they do not handle complaints. For instance, in France the NRA transfers the complaints received to the energy ombudsman. NRAs in Austria, Cyprus and Ireland provided the same data on the number of complaints received by ADR and NRAs, as the NRA is the ADR body in these countries. In countries where data is available, the number of complaints received by NRAs also varies significantly. The majority of NRAs handle complaints (see Figure 102).

352 In Great Britain for example, complaints are defined as follows in Consumer Complaints Handling Standards Regulations: “complaint” means any expression of dissatisfaction made to an organisation related to any one or more of its products, its services or the manner in which it has dealt with any such expression of dissatisfaction, where a response is either provided by or on behalf of that organisation at the point at which contact is made or a response is explicitly or implicitly required or expected to be provided thereafter”.

Figure 102: Number of complaints at ADRs and NRAs per 100,000 inhabitants, for a selection of countries – 2013



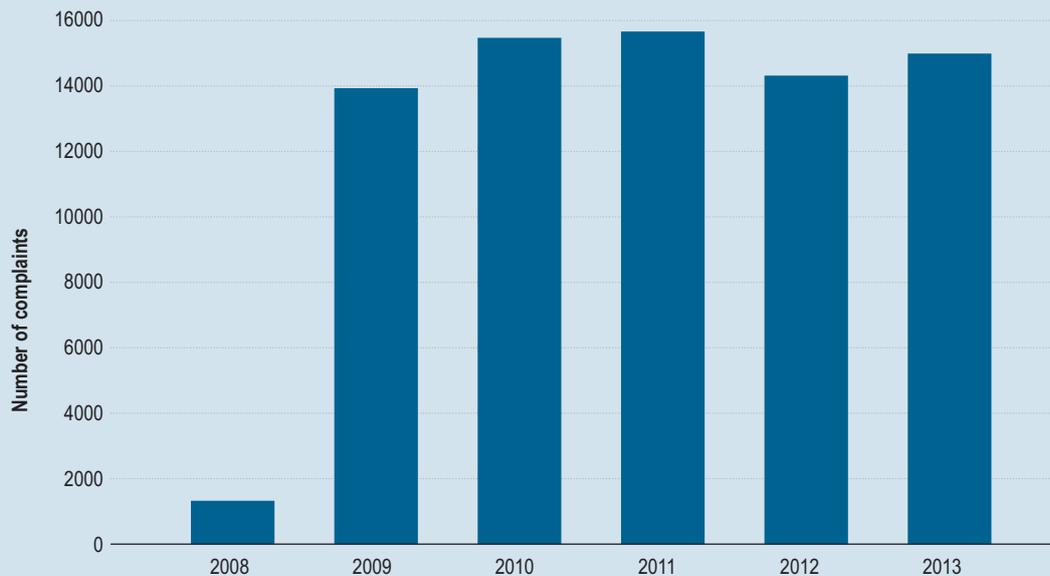
Source: CEER Database, National Indicators (2014)

540 Following from the above figures, extra care should be taken in interpreting complaint data. Low numbers may indicate satisfaction, or perhaps the existence of complex complaint handling procedures. High numbers may suggest dissatisfaction, or potentially strong consumer engagement in the retail energy market, mixed with cultural differences and different levels of market maturity.

Case study 10: Complaints received by the French energy ombudsman, Médiateur National de l'Énergie

In France, the Médiateur National de l'Énergie (energy ombudsman) has dealt with consumer complaints since 2008. Figure i shows that the number of complaints received by the French energy ombudsman has remained stable since 2009 between 14,000-16,000.

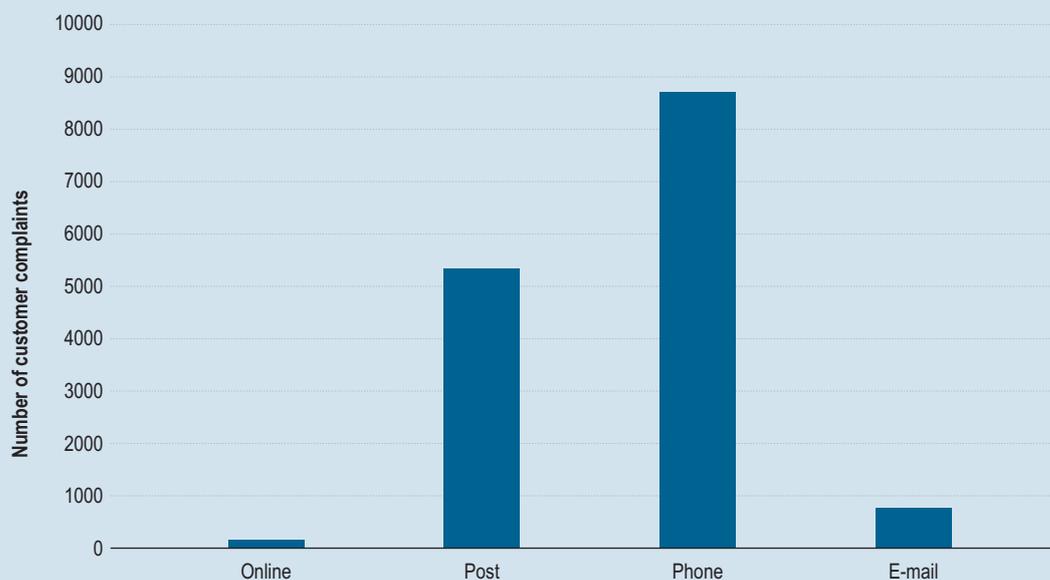
Figure i: Number of complaints per year – 2008–2013



Source: Médiateur National de l'Énergie, Activity Report 2013

Consumers can address their complaints through different channels. Until 2012, there were three channels: surface mail, telephone and e-mail. Since 2013, customers can also address their complaints to the French energy ombudsman by internet. As shown in Figure ii, the main channel for consumers to present complaints is via telephone, while the number of online complaints currently remains low.

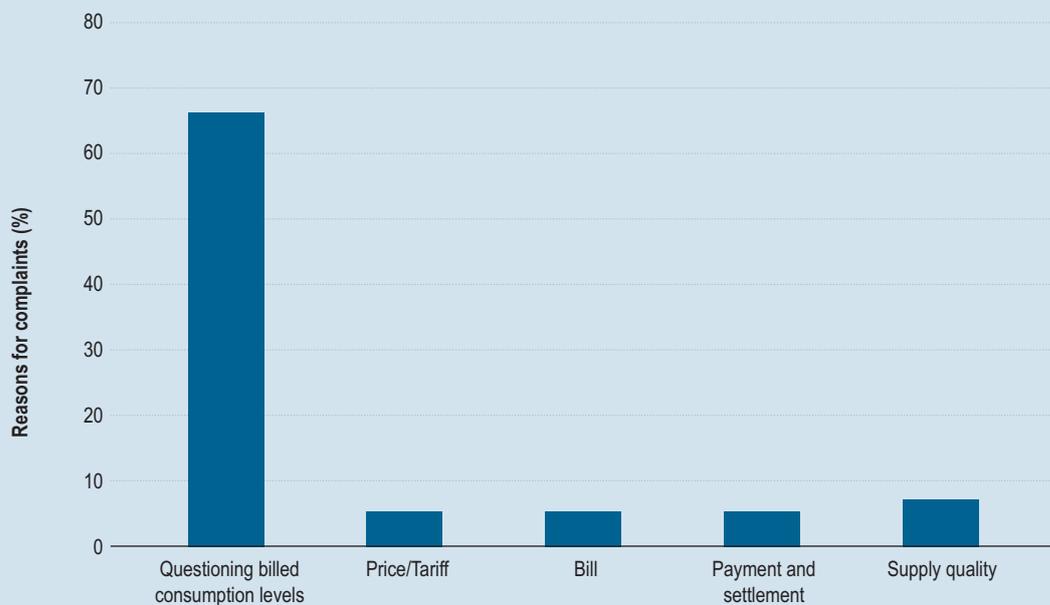
Figure ii: Number of complaints per channel – 2013



Source: Médiateur National de l’Energie, Activity Report 2013

Regarding the different types of complaint, Figure iii shows that consumption billing is the main reason for customers to complain.

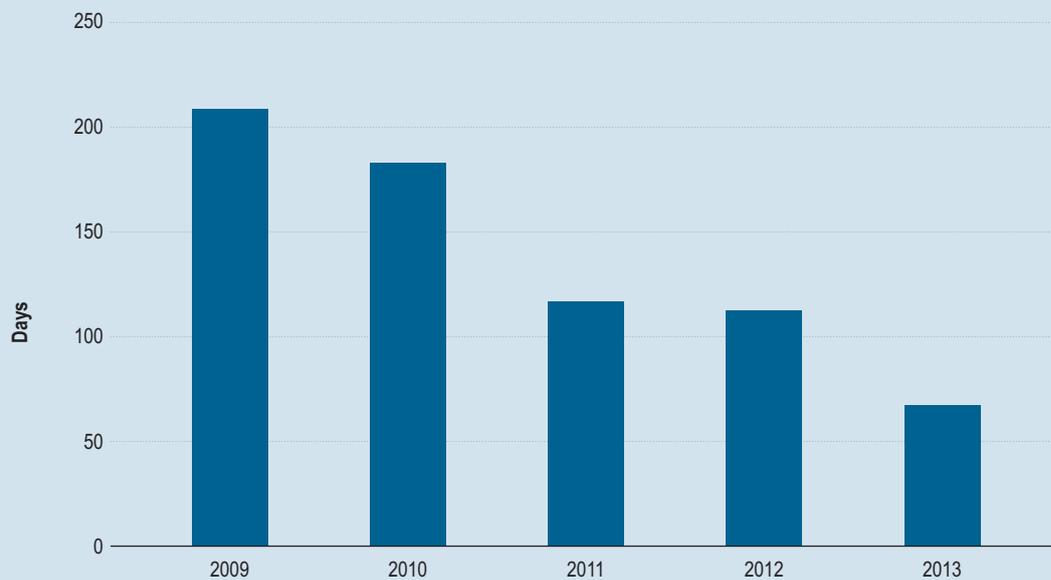
Figure iii: Reasons for complaints – 2013



Source: Médiateur National de l’Energie, Activity Report 2013

Regarding the time needed to solve a complaint, Figure iv shows that this procedure has gradually improved since 2009.

Figure iv: Number of days taken to handle complaints – 2013



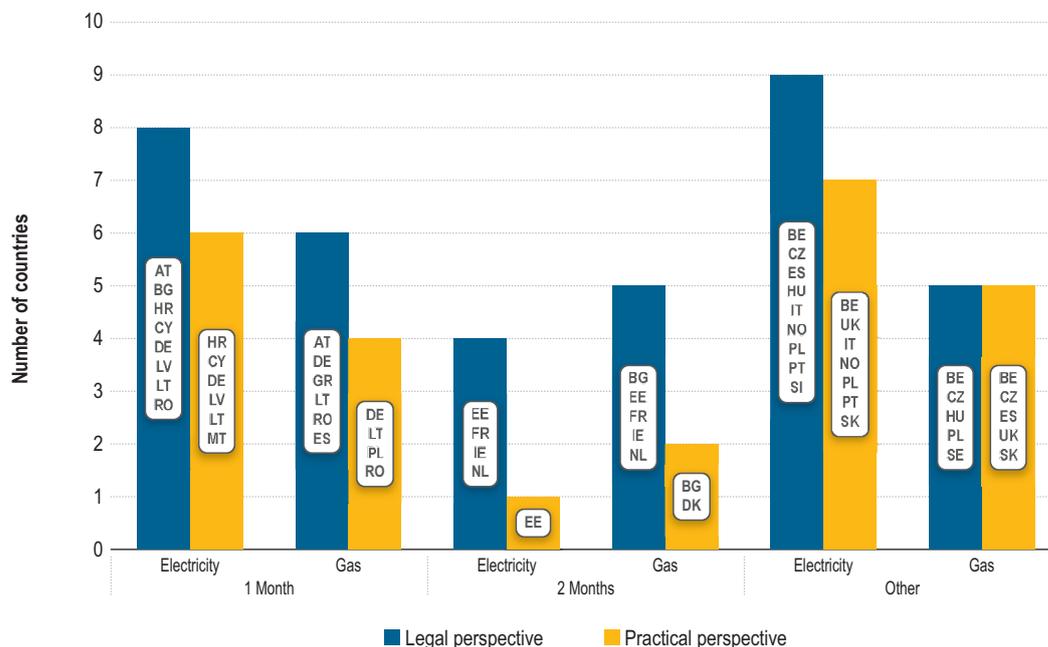
Source: Médiateur National de l'Energie, Activity Report 2013

5.3.2 Complaint procedure

- 541 A complaint is a sign of consumer dissatisfaction, which needs to be heard and dealt with. Therefore, a complaint handling procedure should put in place in each MS to ensure transparent and fair complaint resolution. The European NRAs have always underlined the importance that such a mechanism be independent.
- 542 In the majority of countries, household (end) consumers are informed about the contact details of a complaint service either on their bill, in their contract or both. In some countries, this information can also be found on the website of the NRA or the energy service provider. The legally permitted processing time for service providers to deal with complaints in most countries is between one and two months for both electricity and gas, which is considered a reasonable window for response. However, in some countries the processing time is shorter, such as nine to 15 days in Hungary, Poland and Portugal, or even longer, such as up to four months in Norway³⁵³ (see Figure 103). In Belgium, there are regional differences for complaints on both gas and electricity services: in Flanders, by law the processing time to deal with a complaint is one month for gas, but in practice consumers receive a first answer or a request for further information within 2 weeks; for electricity, consumers will receive a response within one month if the complaint was made through the NRA's website, and two months if it was made through the DSO's website. In Wallonia, the processing time for gas complaints is two months by law; furthermore, suppliers are legally obliged to acknowledge the receipt of complaints within 10 working days and to indicate the period within which the complaint will be handled; in practice, electricity complaints are dealt with within one month.

353 For complaints sent to the NRA. There is no legal time frame for complaints sent directly to the service providers.

Figure 103: Processing time set for service providers to deal with complaints – 2013



Source: CEER Database, National Indicators (2014)

543 As stated in Directives 2009/72/EC and 2009/73/EC, complaint handling standards should be determined at the national level and should be effective. These kinds of standards can help improve customers’ confidence in the market. Regarding statutory complaint handling standards established for service providers in the electricity sector, in 13 out of 28 countries (27 MSs and Norway), statutory complaint handling standards concern the time required to deal with a complaint. In 10 countries statutory complaint handling standards concern the registration of all customer complaints (in the case of Estonia, Greece, Hungary, Lithuania and Spain, the statutory complaint handling standards for service providers are of both types i.e. processing time for dealing with complaints and registration of all customer complaints). Six of the 28 countries still have no statutory complaint handling standards for service providers. Figure for the gas sector are quite similar to the electricity sector. In 12 out of 25 MSs, statutory complaint handling standards concern the time required to deal with a complaint; in 12 countries statutory complaint handling standards concern the registration of all customer complaints (in the case of Bulgaria, Estonia, Greece, Hungary, Lithuania, Portugal and Spain, the statutory complaint handling standards for service providers are of both types i.e. processing time for dealing with complaints and registration of all customer complaints). In the majority of countries, these standards are set either by the NRA or the government.

5.3.3 Alternative Dispute Resolution (ADR)

- 544 Besides the option that complaints can be handled by the energy service providers, there should also be a possibility for consumers to use out-of-court dispute settlement to deal with their issues. According to Directives 2009/72/EC and 2009/73/EC, MSs are required to set up an independent mechanism for out-of-court dispute settlements.
- 545 In almost all of the countries, ADR is available to consumers free of charge. The Netherlands is an exception, where it costs 27.5 euros, although if the dispute is settled in the consumer's favour, the money is reimbursed. In most countries, household consumers can find information about the competent ADR body either on their bill, on the contract or on the website of the NRA or/and the energy service providers. In 12 of the 27 countries (26 MSs and Norway), the ADR is the NRA itself, whereas in three countries there is a specific energy third-party body that acts as the ADR body. In eight of the 27 countries, however, the ADR is a not an energy-specific third-party body. In the specific case of Portugal, the NRA, consumer associations and other entities such as arbitration centres can act as ADR.
- 546 Regarding energy service providers, statutory complaint handling standards should also be in place for ADR. Although not much data was received on this issue, the main standards concern the communication of complaints to the energy service provider(s) before coming to a decision/recommendation, the processing time to solve the dispute, and the issue of a prompt first response or acknowledgement of the complaint.
- 547 The period for settling disputes varies across countries. In six of the 27 countries (26 MSs and Norway), the processing time is one month; in other countries, the processing time is longer and can be from two to six months.
- 548 Table 10 finally displays the total number of disputes settled by an ADR. The figures vary across countries and should be read in contrast to the total number of households in that country. For instance, Great Britain has an average of 26.9 million electricity household consumers, while Luxembourg has only 224,000 electricity household customers. Again, the data shown in Table 10 represent both the electricity and the gas sector as for some countries it is not possible to distinguish between them. It is interesting to compare the average compensation for consumers in the case of a favourable outcome in an out-of-court procedure. For instance, In Italy, compensation is much higher than in the other countries listed in the table.

Table 10: Number of settled disputes and amount of average compensation in favourable outcomes for customers for electricity and gas in 2013

Country	Number of disputes settled	Average compensation in favourable outcomes in out-of-court procedures (in euros)
Austria	2,800	
Belgium	Flanders: 2	
Wallonia: 267		
Brussels: na		
Federal: 2,659	Flanders: no compensation	
Wallonia: na		
Brussels: na		
Federal : 234		
Bulgaria		
Croatia	131	
Cyprus		
Czech Republic	8,118	
Denmark		
Estonia		
Finland		
France	2,518	578
Germany	9,600	
Great Britain	12,155	132
Greece		
Hungary		
Ireland	656	
Italy*	367	2,900
Latvia		
Lithuania	49	
Luxembourg	3	
Malta		
Norway	60	
Poland		
Portugal		
Romania	2	
Slovakia	11	
Slovenia	11	
Spain		
Sweden	3	
Netherlands	895	482

Source: CEER Database, National Indicators (2014)

Notes: *In Italy, disputes are settled directly and only by the NRA.

5.4 Customer Access to Information about the Costs and Sources of Energy

- 549 Since their liberalisation, Europe's energy markets have produced a large number of electricity and gas products which differ, among other things, in price and origin. These are two of a few criteria which final household consumers regularly evaluate in choosing their supplier of energy, with price being probably having more influence on consumers' choice of supplier than the source of energy. Knowledge and adequate understanding of energy prices, total energy costs and the source of energy are therefore paramount to final household customers' choices in the energy markets. Yet access to information about energy prices, costs and sources of energy can vary across Europe. Information may be made available through different market players and variegated communication channels; while the differing levels of detail also contribute to complicating access to such information across Europe.
- 550 In 2013, CEER conducted a status review to investigate how such information is made available to final household customers across Europe, which market actors provide what information and the communication channels used³⁵⁴ The review – based on input from 23 NRAs – reveals that a great deal of information on energy costs, sources and energy efficiency schemes is made available to Europe's final household consumers by various market actors in multiple ways. Very detailed information on the cost and sources of energy can be found in online bills, despite some noteworthy differences between and within countries (i.e. between different providers of information). The most important information about the variegated cost components of energy is available from energy bills, whereas information about the sources of energy can be found primarily online (with the notable exception of the company energy mix, which often must be printed on the bill). However, the report also reveals that some information on the cost of energy (e.g. additional end-user costs due to energy efficiency schemes) or sources of energy (for instance, the geographical origin of gas or reasons for price differences between energy from different sources) is less frequently available. Although a great deal of information on the cost and sources of energy is available to consumers in a number of countries (e.g. Belgium, Germany and Great Britain), in other countries information is only available on a small number of cost aspects (e.g. Greece).
- 551 NRAs are very active in providing information on the costs and sources of energy, although again, to varying degrees. They are more active in some countries (e.g. Austria, Belgium, Portugal or Slovenia) than others (e.g. Greece, Hungary or Malta). Generally speaking, NRAs inform more about the costs of energy rather than on its sources. Other market participants also provide similar information on the costs and sources of energy to consumers. In some countries, customers may draw on information from many different sources (e.g. Belgium, Germany and the Netherlands).
- 552 While the aforementioned access to information is crucial, the intelligibility of such information is even more important. However, to assess how consumer-friendly the information provided is goes considerably beyond the average competencies of NRAs and was therefore beyond the scope of the review. In some countries, it has not been the responsibility of the NRA to monitor the provision of information to final household consumers, which naturally limits their relevant knowledge.

354 See: http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/2013/C13-CEM-65-04_InfoAccess_16-Dec-2013.pdf.

5.5 Conclusions and recommendations

- 553 As already identified in the MMR 2012, some disparity is still observed across MSs in the application of the consumer-related provisions of the 3rd Package.
- 554 Many of the national legal provisions (de jure) are applied in practice (de facto) on a similar basis (with the practical approach outperforming the legal requirement in some cases). Some countries perform better than the requirements of the 3rd Package as regards some provisions, such as the duration of supplier switching and the time taken to receive the final bill following a switch. However, there remains significant room for improvement by suppliers/DSOs regarding the information provided in the bills about supplier switching possibilities and the implementation of statutory complaint handling standards such as shorter answering periods.
- 555 In addition, more work is still needed at the national level by many regulators to better manage and analyse complaint data and monitor the number and practicalities around the issue of disconnection due to non-payment. As previously identified in the MMR 2012, the persisting challenges in comparing complaint data could merit the examination of a common methodology for collecting complaints.
- 556 The roll-out of electricity smart meters is undertaken progressively in the majority of MSs, while the roll out of gas smart meters is uncertain in most MSs. As a consequence, smart meters are not yet in place in the vast majority of countries, and most consumers receive information on their actual consumption on an annual basis, which is not frequent enough according to the Energy Efficiency Directive (EED). Therefore, MMR 2014 examines how the provisions of the EED related to metering and billing would have been put in practice.

At the European level, regulators will continue to promote the implementation of the consumer provisions in the 3rd Package through recommendations and advice³⁵⁵, along with continuous monitoring activities.

355 As part of these efforts, CEER will continue to work with BEUC and the supporters of the 2020 Vision for Europe's Energy Customers to implement the principles of reliability, affordability, simplicity, protection and empowerment in the energy market.

Annex 1: Methodology to calculate mark-ups in gas and electricity retail markets

This annex explains the scope, methodology and data requirements used in the mark-up calculations presented in Section 2.3.2³⁵⁶.

The mark-up is primarily defined as the difference between the retail energy component costs and the wholesale market price. Mark-ups are not precisely comparable to final profit. Suppliers have to pay operational costs and taxes out of this margin. Mark-ups represent the gross margin, while the actual or net margin will depend significantly on operating costs and consumption levels. However, the evolution of mark-ups may serve as an indication of the level of retail competition and the 'responsiveness' of retail to wholesale prices over time.

Retail energy component cost

The available data for this exercise differ for gas and electricity markets. Therefore, two different approaches were taken in order to assess the retail household energy component cost in each of the markets. Both consumption levels and prices indicators were used for the analysis.

a) Electricity

- Consumption levels: the DC Eurostat consumption band (2,500-5,000 kWh) was applied.
- Eurostat's breakdown providing data on the energy component of the retail household final prices was used. Data are available for a longer period and for all EU MSs. Eurostat data was cross-checked for inconsistencies with the ACER database on retail offers and other relevant data.

b) Gas

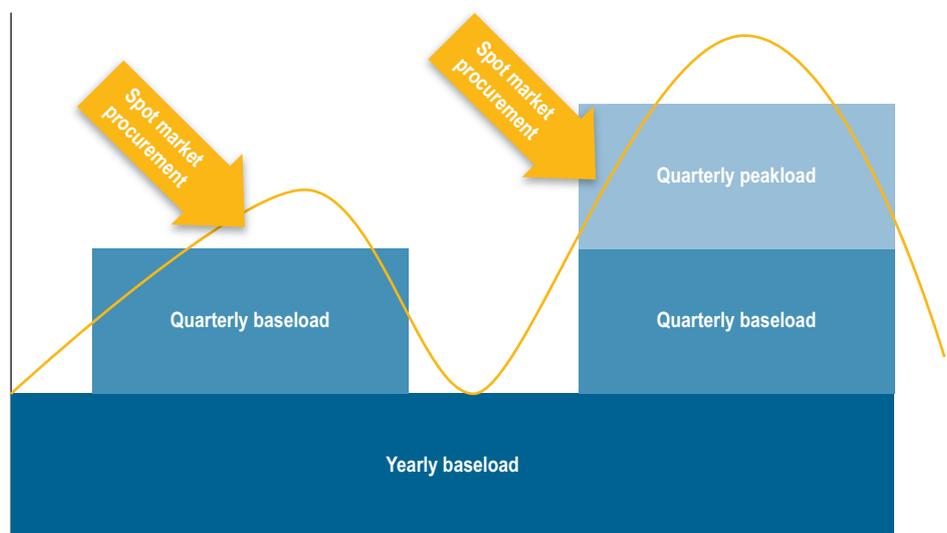
- Consumption level: an EU rough average consumption level (15,000 kWh/year) was applied.
- Energy component: the ACER database on retail offers breakdown was used, since Eurostat does not provide a detailed component breakdown for gas.

Methodology to identify the wholesale price

The energy costs which suppliers incur when buying electricity to supply customers at retail level depend on several factors. Wholesale energy costs vary between suppliers and over time with changing wholesale prices and procurement strategies (Figure A 1). These strategies include hedging schemes against volatile short-term (day-ahead) prices. Hedging strategies are characterised among other factors by: i.) the portfolio of products used to hedge; ii.) the point in time when firms start to purchase energy ahead of the time of delivery (e.g. 12, 18, 24, etc. months); and iii.) the point in time when firms stop purchasing energy (e.g. 12, 6 months ahead of the time of delivery, immediately before delivery, etc.).

³⁵⁶ Note that in the Section assessing mark-ups, mark-ups were assessed for retail household consumers. For electricity, mark-ups were estimated for the period from 2008 to 2013; meanwhile for gas, the assessment covers only the 2012 to 2013 period due to the limited data available.

Figure A 1: A schematic representation of a procurement model



Source: E-Control

Products for hedging, if available to market participants in an MS, include annual (base/peak), quarterly (base/peak), monthly (base/peak) and swaps. Hedging can also be achieved by means of long-term bilateral contracts. In electricity, prices of bilateral contracts are usually not known. In gas, long-term bilateral contract prices may be indexed to different commodities – mainly oil – or also to hub prices. The individual conditions of each particular contract make it difficult to assess final gas prices. Nevertheless, even when companies use bilateral contracts, market-based prices can be used to estimate their value, since the energy of bilateral contracts can be valued at the price at which companies are able to sell the energy on the wholesale market.

Provided that suppliers have access to markets with sufficiently liquidity in forward markets in an MS, suppliers need to strike a balance between the amount of forward and spot products that are to be procured to fulfil the contractual obligations downstream. For example, a 'short' strategy would mean that for most of the hours in the year, the supplier needs to buy in the spot market to meet the demand to be served. A 'balanced' strategy would mean that additional electricity has to be bought on the spot market half of the time in a year, while during the other months the retailer needs to sell excess electricity on the spot market. A strategy whereby 100% of the energy is procured on the spot market seems unlikely, as it entails a high risk for suppliers. An exception would be those markets where suppliers offer products which are directly linked to hourly day-ahead prices, as in the case of electricity suppliers in Norway.

Approach for electricity

As explained above, procurement strategies feature many hedging schemes requiring diverse phases³⁵⁷. Due to data and time constraints, for the analysis presented in this MMR, the following methodology was applied to infer electricity wholesale market prices:

- i. Where insufficient hedging products are available, the analysis was based on the best available information (usually day-ahead prices);
- ii. Where sufficient liquid organised forward markets are available, the assessment was based on one selected hedging strategy combined with a limited procurement of day-ahead products to match demand.

In case of ii the following simplified hedging strategy was used:

- The hedging strategy was based on the procurement of year-ahead and day-ahead products;
- The start and finish point of energy procurement was assumed to start 18 months³⁵⁸ ahead of delivery and finish 6 months before delivery³⁵⁹. The incurred cost of year-ahead products is assumed to be spread across the buying period, and assumes a constant rate of purchase; and
- The amount of electricity contracted year-ahead to supply downstream was assumed to be equal to the lowest observed consumption (i.e. load) on a day during a year in an MS. The remaining daily (variable) demand was assumed to be sourced (by buying or selling) day-ahead³⁶⁰. Figure A 2 presents a schematic representation of the share of year-ahead versus day-ahead procurement using household electricity load profiles for Spain³⁶¹.

357 For an accurate assessment of the cost of different hedging strategies, the following detailed information and steps among others would be required to:

- Define a set of hedging strategies to be assessed, including the start and final point for procuring energy, and the balance of products to be procured to meet demand (yearly products, quarterly, etc.)
- Obtain full access to prices of all forward and day-ahead products.
- Use volume weighted averages to take account of the different volumes procured throughout the year to meet demand (e.g. procurement of gas will be higher for delivery in winter than in summer).
- Calculate the 'shaping costs' (for electricity), which are the costs of shaping the purchasing of electricity to match the hourly demand profile of domestic consumers. 'Shaping costs' may include:
 - the costs of financial products (e.g. options) to hedge the price risk for the energy to be purchased day-ahead (difference between day-ahead demand forecast and the procurement of long term products).
 - the costs of buying (or reselling) day-ahead the missing (or excess) of energy, resulting from the difference between day-ahead demand forecast and the procurement of long-term products.
 - Calculating 'shaping costs' implies that the expected hourly load profile of households need to be available.

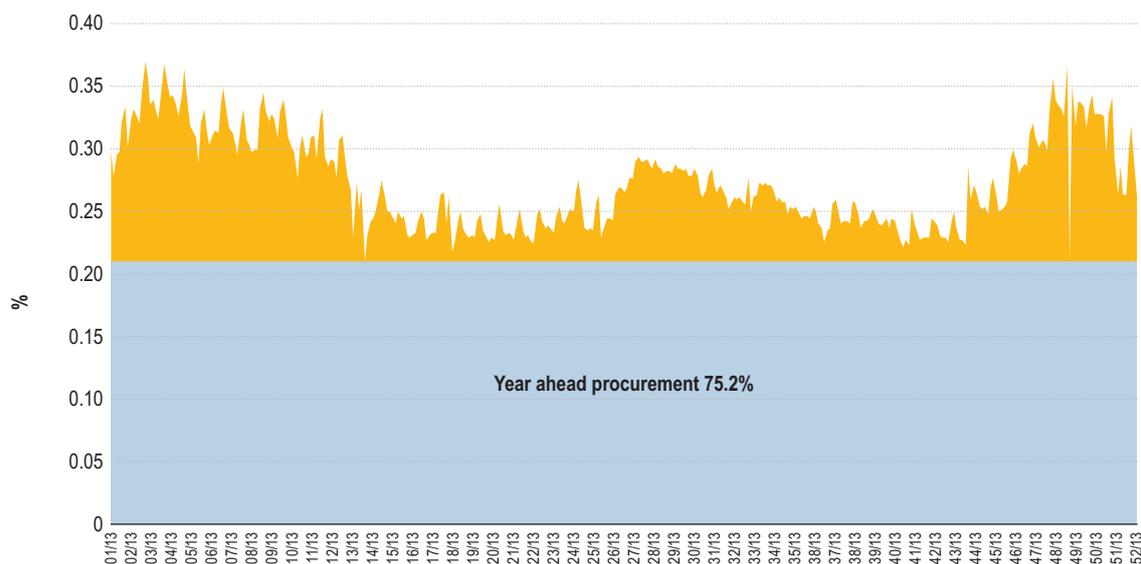
358 For some MSs, these contracts may not be available, in which case the best alternative is selected (i.e. procurement starts 12 months ahead of delivery and finishes just before delivery).

359 This has proved a reasonable strategy (e.g. based on Ofgem's work).

360 For the demand profile, national household consumption profiles will be used where available. Otherwise, they will be based on overall load profiles as provided by ENTSO-E.

361 As explained above, household hourly profiles would normally be used instead, where available.

Figure A 2: Schematic representation of the proposed calculation of the share of forward YA procurement based on household electricity load profiles for Spain – January–December 2013 (daily demand, MWh)



Source: CNMC, ACER (2014)

In view of the above methodological steps, the following approaches are envisaged for the different MSs:

Table A 1: Electricity wholesale market prices procurement strategies employed per MS.

Approach	Country
Procurement based on hedging (X% yearly base load, 100- X% DA)	Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Great Britain, Italy, the Netherlands, Poland, Portugal, Spain.
Procurement 100% based on DA	All the other MSs with non-existent or illiquid forward markets, provided that organised day-ahead markets are available. Also MSs where prices correlate much better with DA prices: this includes Norway and Sweden

Approach for gas

In the majority of EU MSs, gas supplies are still negotiated through long-term bilateral contracts. Only a few MSs have organised markets (i.e. gas hubs), and not all of these hubs seem to deliver sufficient liquidity on forward products on which to base a hedging supply strategy. Therefore – as in the case of electricity – different approaches were considered when assessing the wholesale gas prices for each of the different EU MSs:

- i. If the MS has no hub, the gas wholesale price was fully referenced to the prices of long-term contracts by using the Eurostat Comext Database on declared gas import prices at the MS's borders;
- ii. In MSs with hubs, although with insufficiently complete and/or illiquid forward products³⁶², a combination of long-term contracts prices plus short-term hub products prices was used; and
- iii. In those MSs having hubs with sufficient liquidity in forward market products, the assessment was based solely on hub price references.

In the case of ii the following simplified 'hedging' steps were taken:

- In those less liquid hubs³⁶³, the wholesale price reference was mainly based on monthly long-term contract prices – again through the Eurostat Comext Database on declared gas import prices at the borders of MSs – plus the incorporation of a small portion of average day-ahead prices from organised markets.
- The considered amount of gas purchased each month was 80% of long-term contracts' price reference and 20% of average day-ahead price procurement.

In the case of iii the following simplified hedging strategy was devised:

- The proposed hedging strategy was assumed to be based on two products year-ahead and day-ahead products;
- The start and finish point of gas procurement was assumed to start 18 months³⁶⁴ ahead of delivery and finish six months before delivery; and
- The amount of gas purchased with year-ahead products was made equal to the average daily demand of the lowest consumption month of the year. The difference between each month's demand and the month of lowest consumption will be covered by the average price of day-ahead products in the month.

362 Sufficient liquidity values were measured on the basis of the ICIS Heren European Gas Hubs Report 2012 Tradability Index; even in some hubs where certain forward products were offered, these were not entirely considered as sufficiently representative of an overall wholesale price reference due to their limited tradability.

363 See footnote 362.

364 See footnote 358.

In view of the above methodological steps, it is envisaged to apply the following approaches to the different MS:

Table A 2: Gas wholesale market price procurement strategies employed per MS.

Approach	Country
Procurement 100% based on LT contracts import prices – a) i	All others
Procurement based on LT and on DA hedging for less liquid hubs – a) ii	Belgium, France, Austria, Italy, the Czech Republic, Denmark
Procurement based on hedging for more liquid hubs – a) iii	UK, the Netherlands, Germany (NCG + GASPOOL)

Note: Eurostat Comext database – at 10 February 2014 – provides no data on gas import prices in Austria, Denmark, Finland, Germany, Luxembourg, the Netherlands and Poland. Those NRAs were individually requested to provide the data, or to validate, at the ACER's proposal, alternative sources.

Treatment of other supply costs

In addition to sourcing costs from the wholesale market, other costs (non-energy related) are incurred by suppliers at the retail level; these include operating costs such as customer services, staffing, IT, sales/marketing, billing, debt costs, etc.

Nevertheless, some other costs (energy-related) which are not included in the analysis may differ significantly between MSs. These include, for example, in electricity:

- i. Network losses, in some MSs, these are components of the network charges. In some others, the wholesale cost borne by suppliers is directly increased by the percentage of losses;³⁶⁵
- ii. System services, which are not included in some MSs in the network charges and which are sometimes not negligible³⁶⁶; and
- iii. Other supply costs (e.g. Renewable Obligation Certificates) that are not network or tax/subsidy-related.

By excluding these costs, the estimated mark-up results will be less comparable across the MSs. In order to remedy this, ACER refined the methodology and collected information about 'other supply costs' (energy-related) in each MSs. In collecting these data, the MM drafting team required assistance from NRAs.

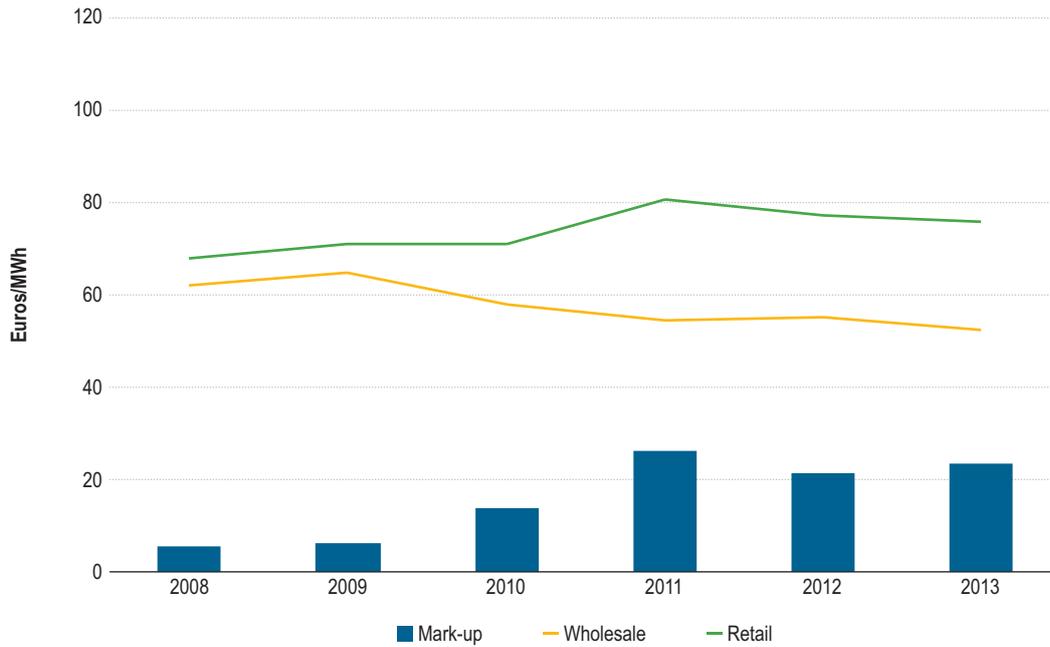
³⁶⁵ For example, 7% of the electricity wholesale price in GB and 14% in Spain.

³⁶⁶ For example, in Spain redispatching and balancing costs and capacity payments reach nearly 10 euros/MWh.

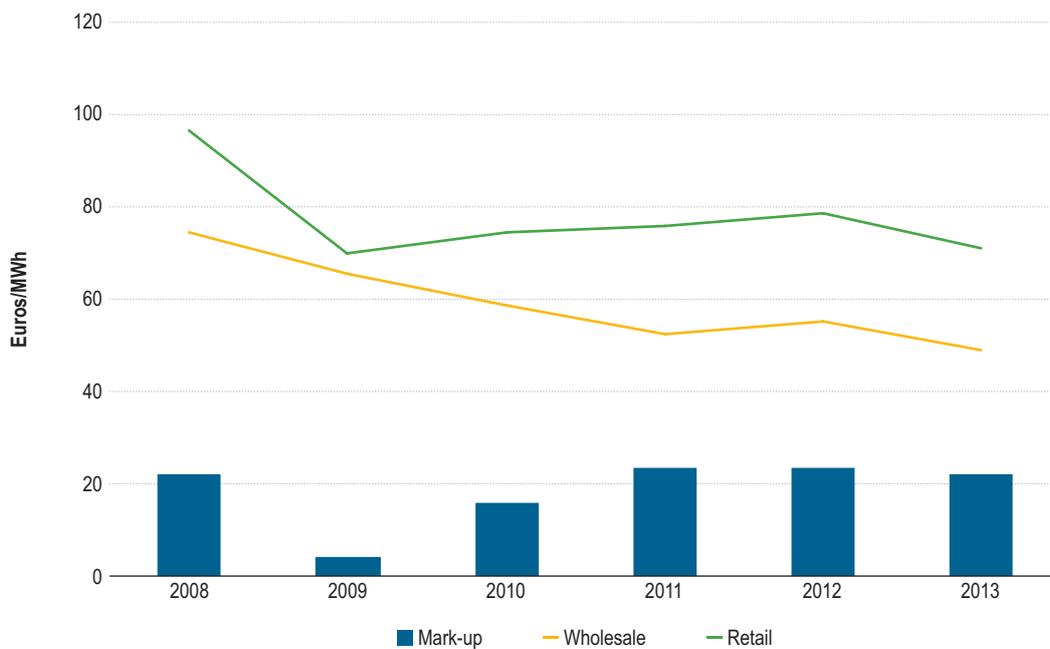
Annex 2: The relationship between the wholesale and energy component of retail electricity prices by country

Figure A 3: The relationship between the wholesale and energy components of retail prices – euros/MWh

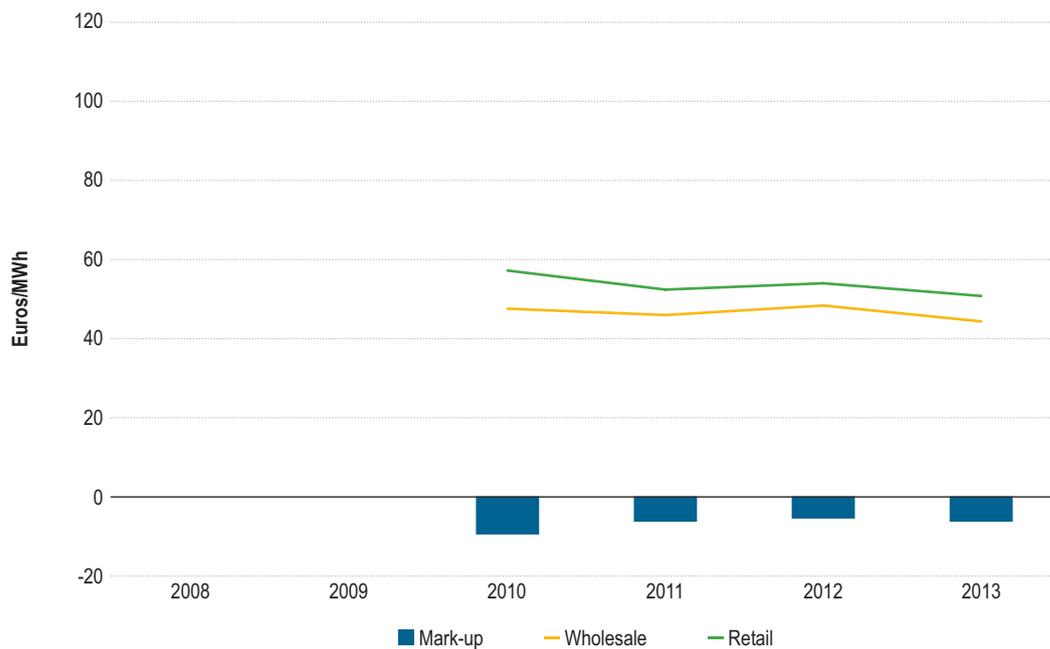
Austria



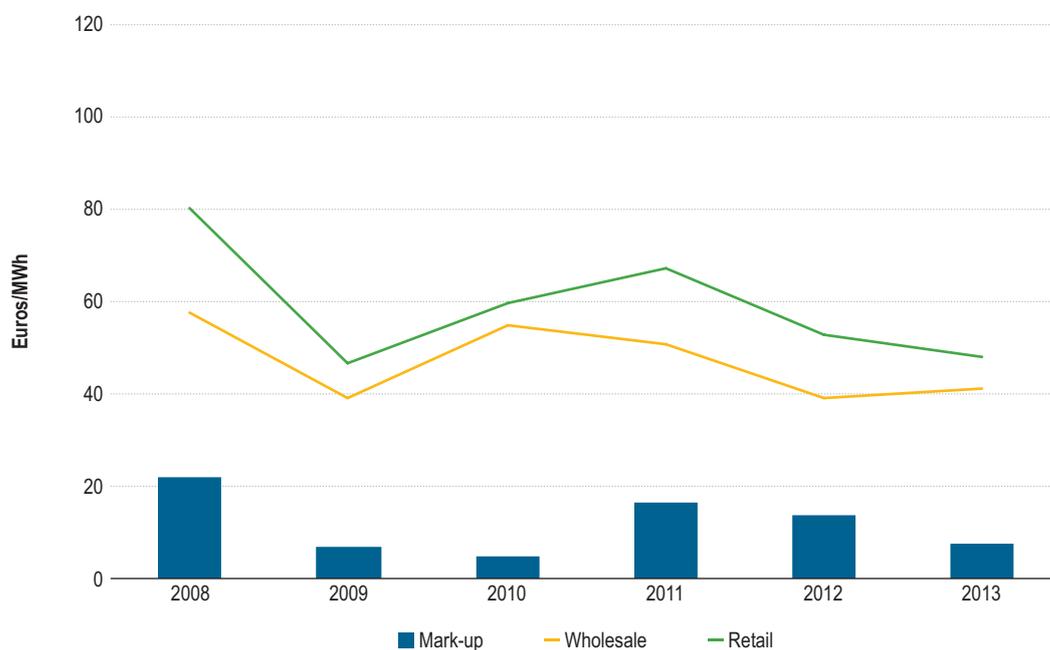
Belgium



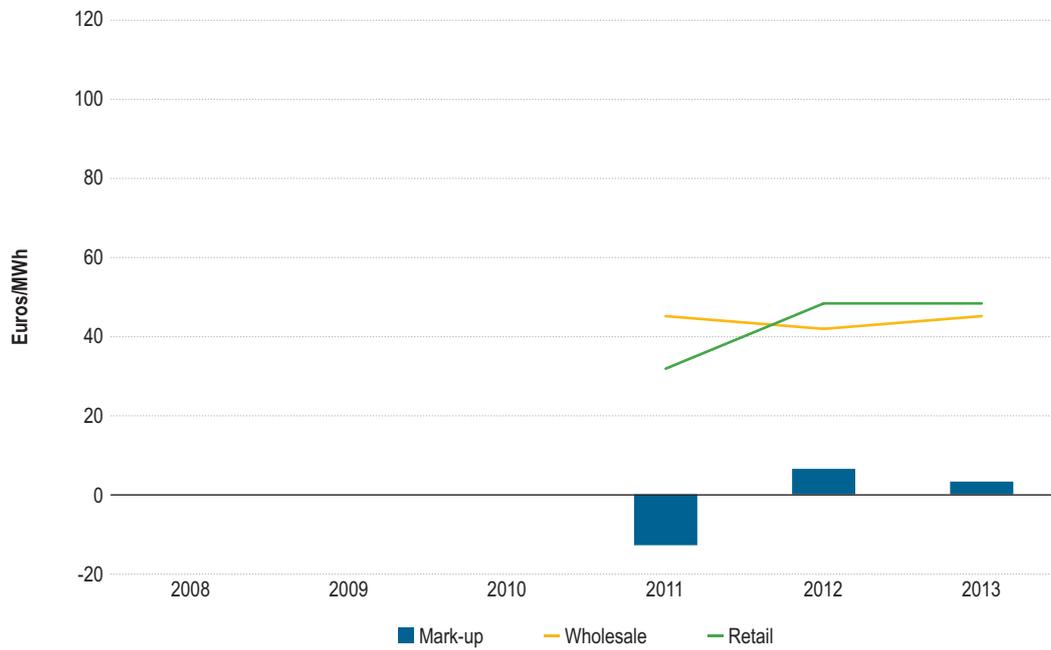
Czech Republic



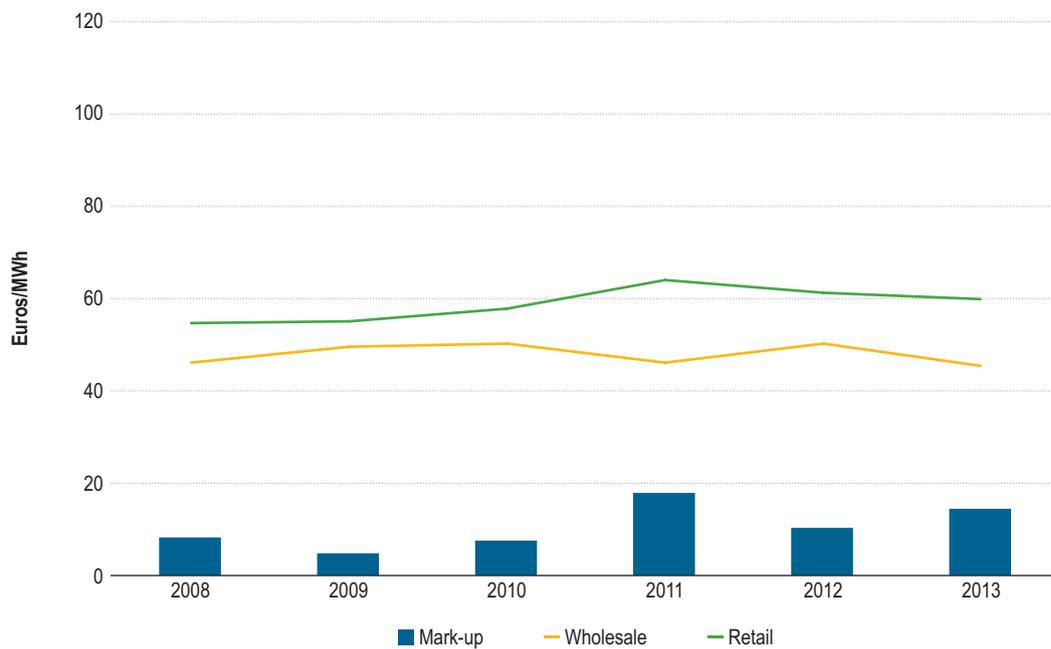
Denmark



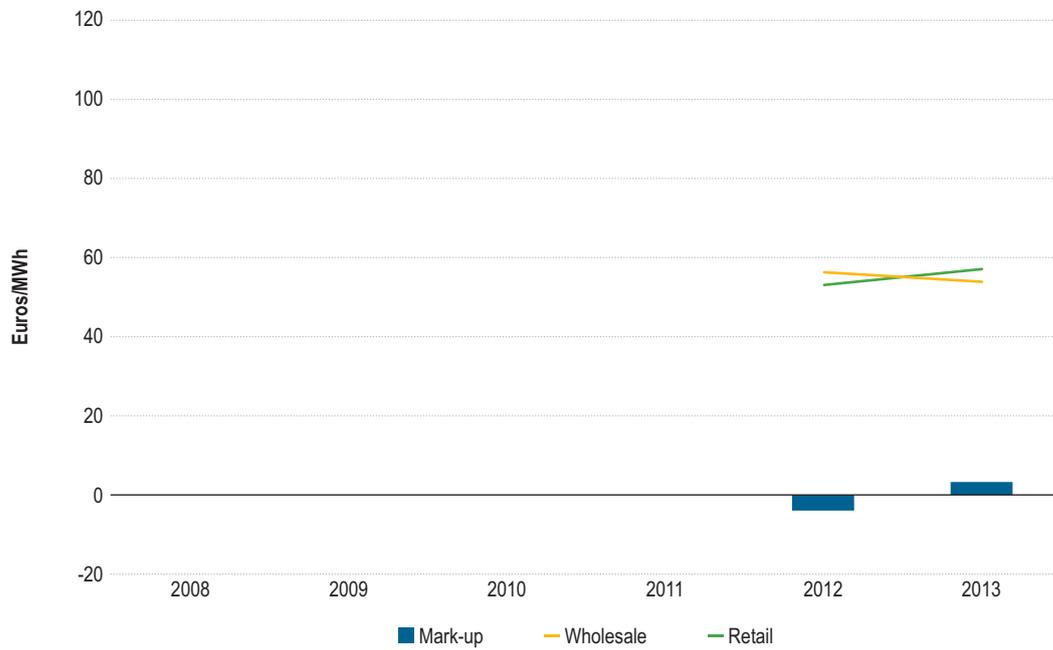
Estonia



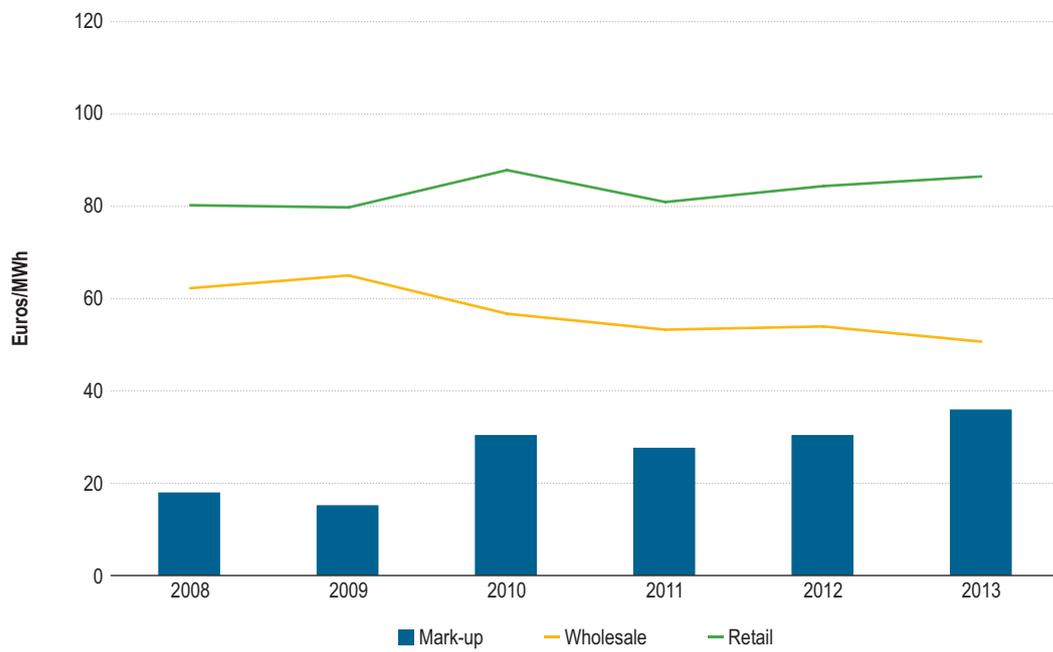
Finland



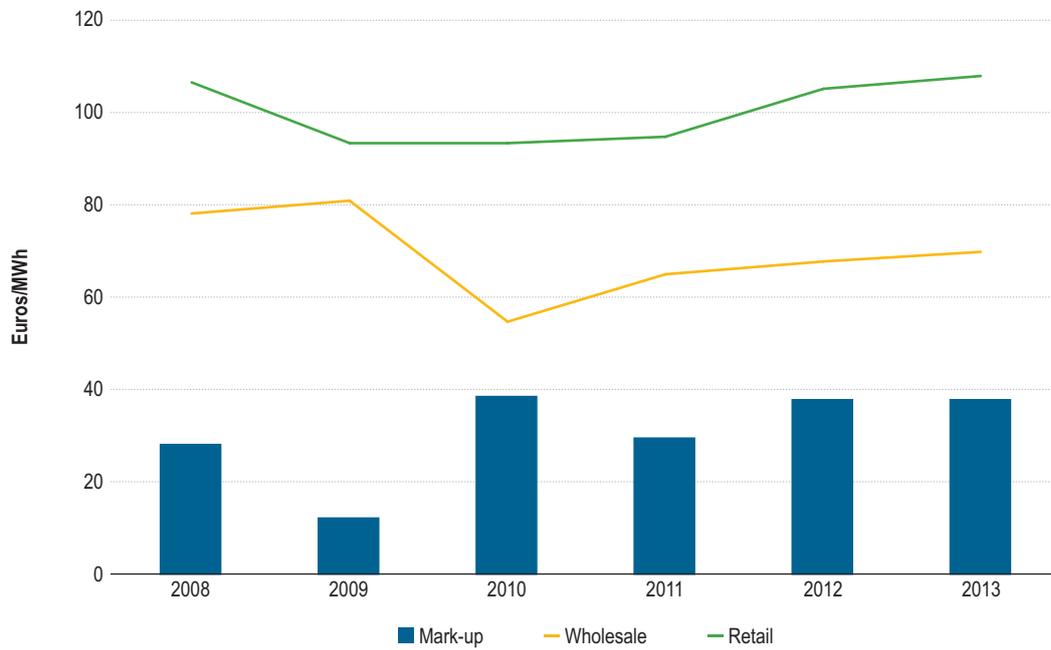
France



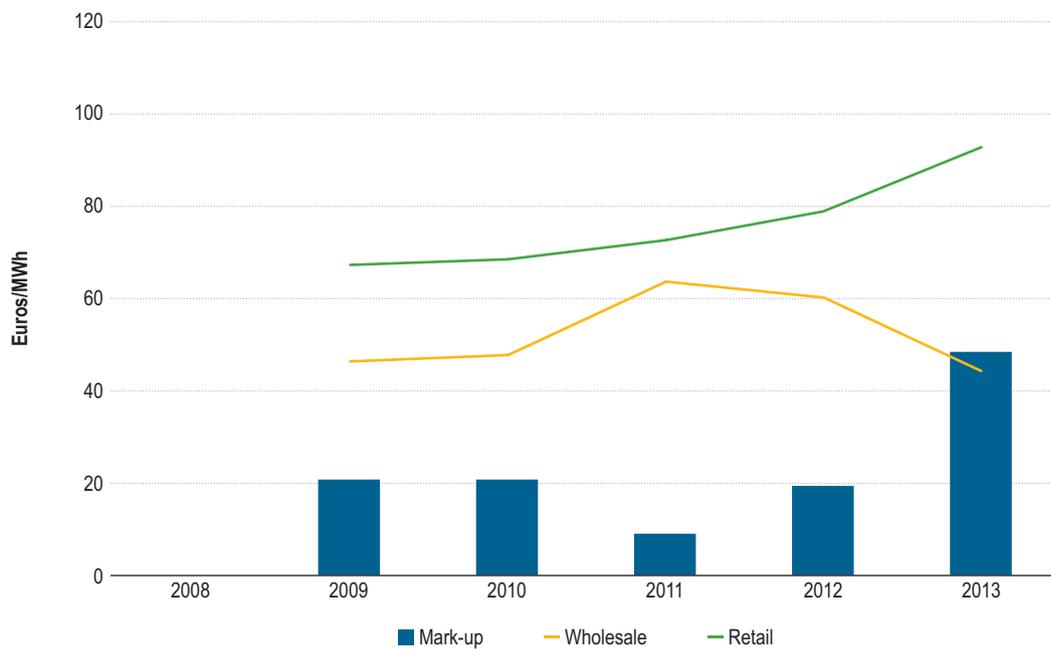
Germany



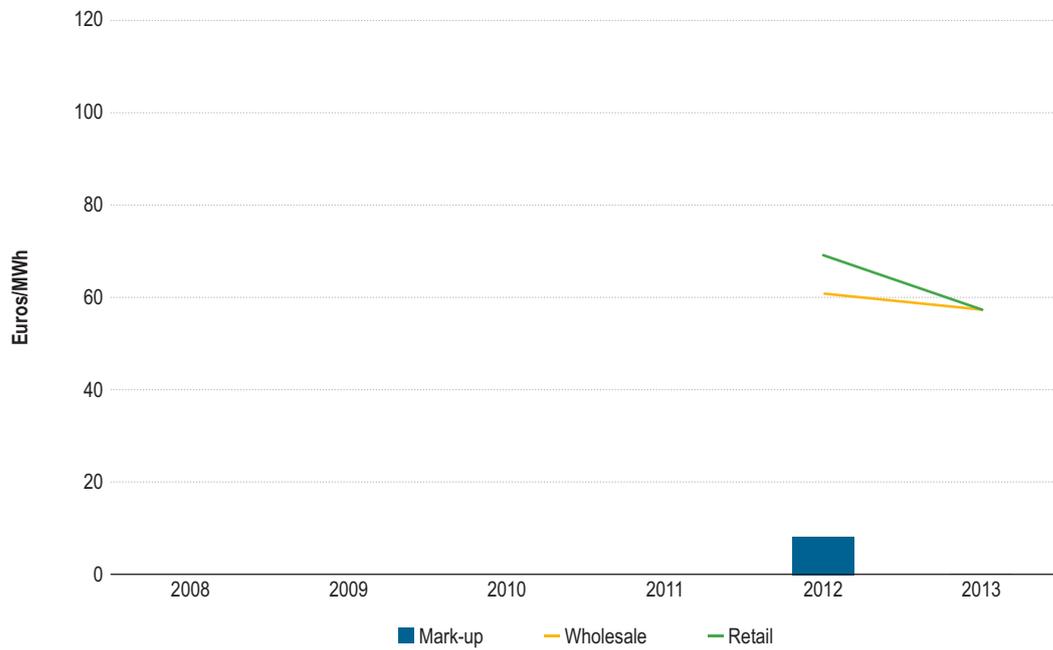
Great Britain



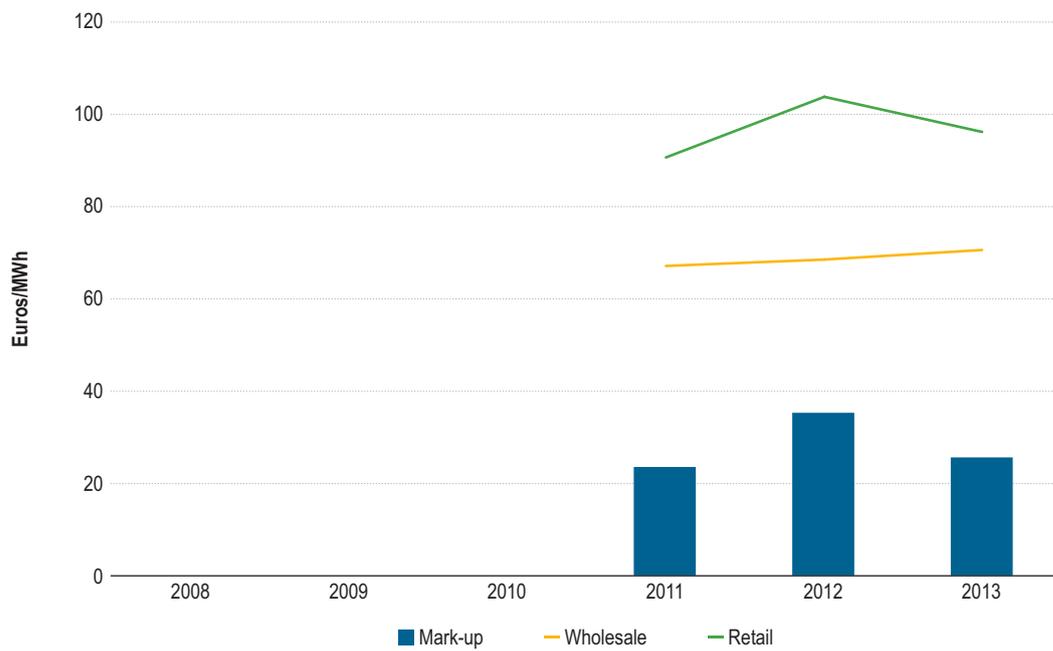
Greece



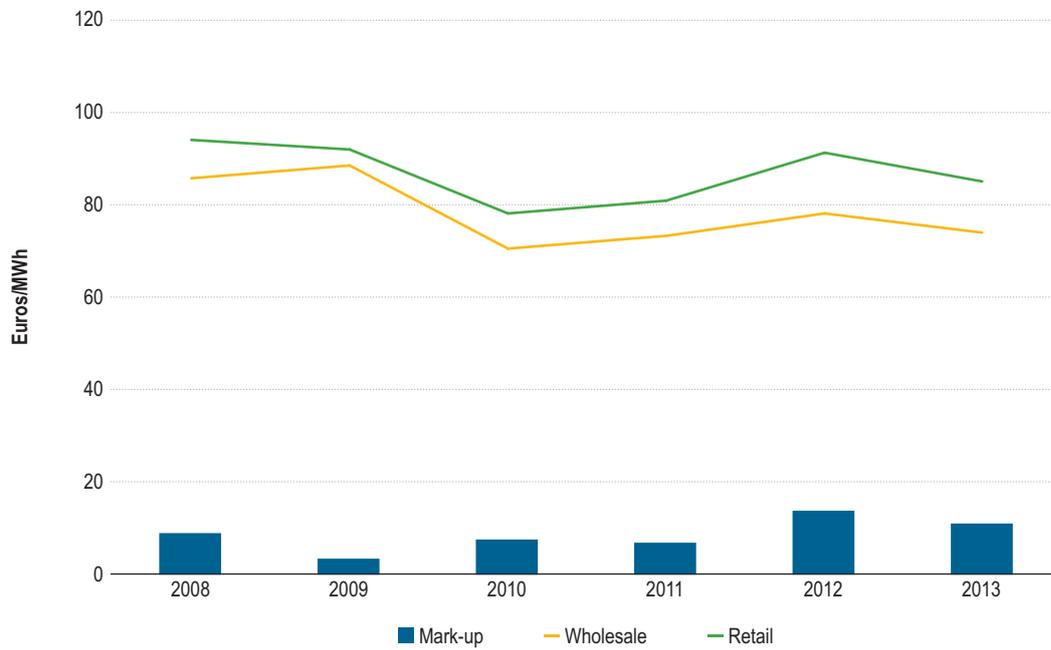
Hungary



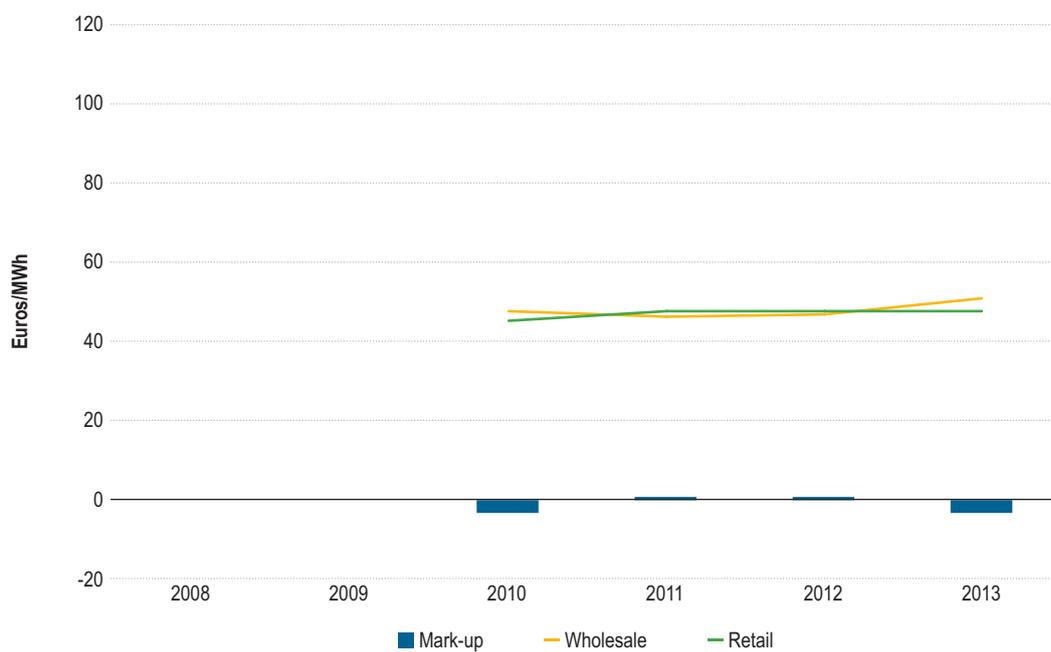
Ireland



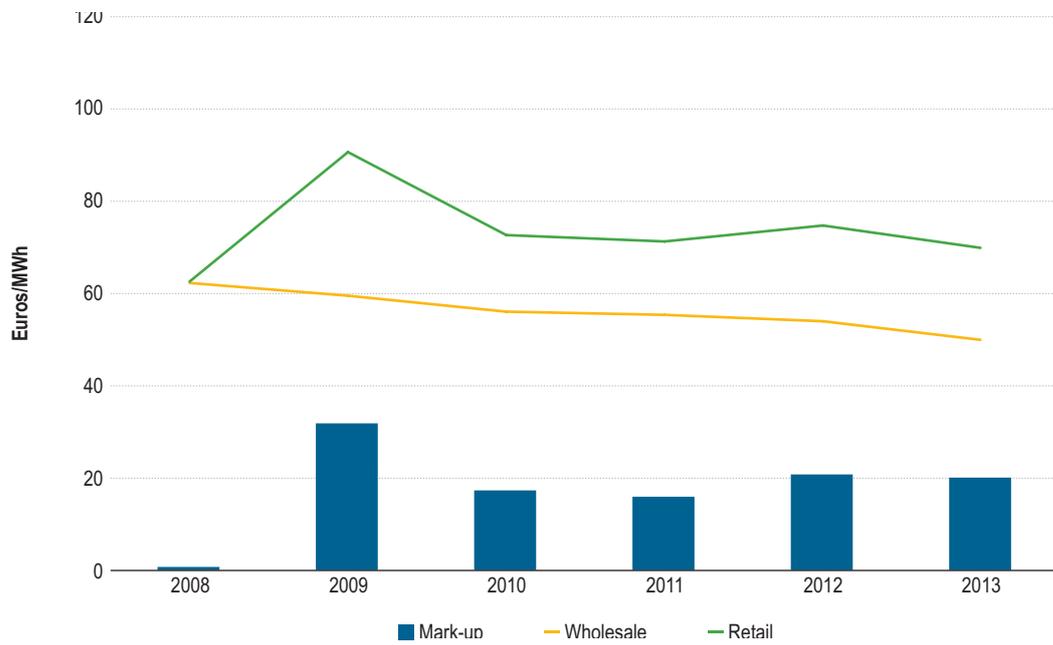
Italy



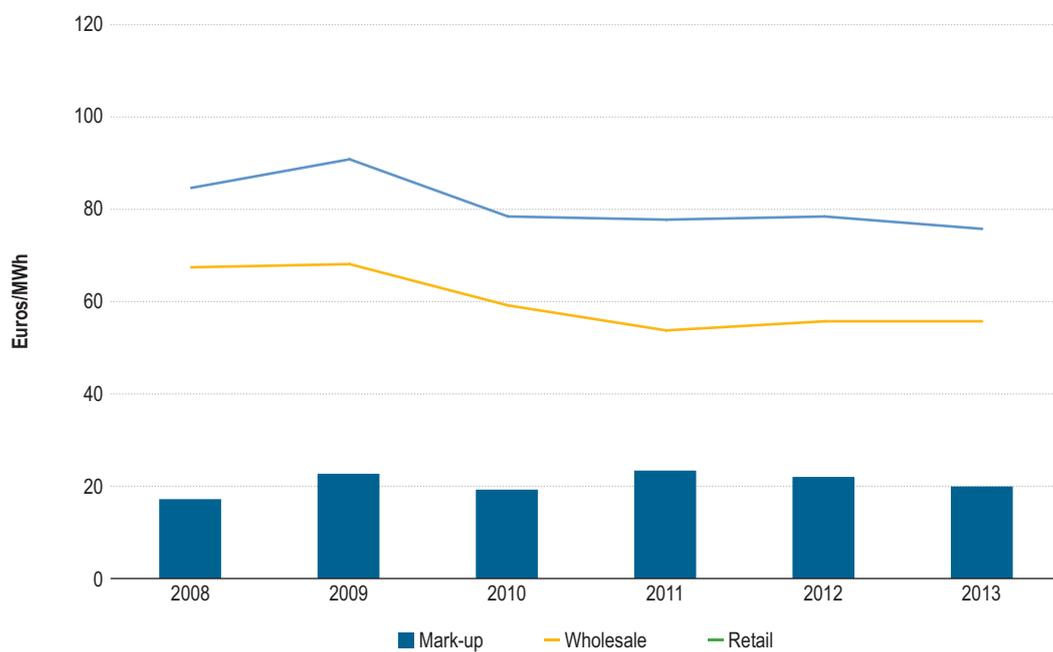
Lithuania



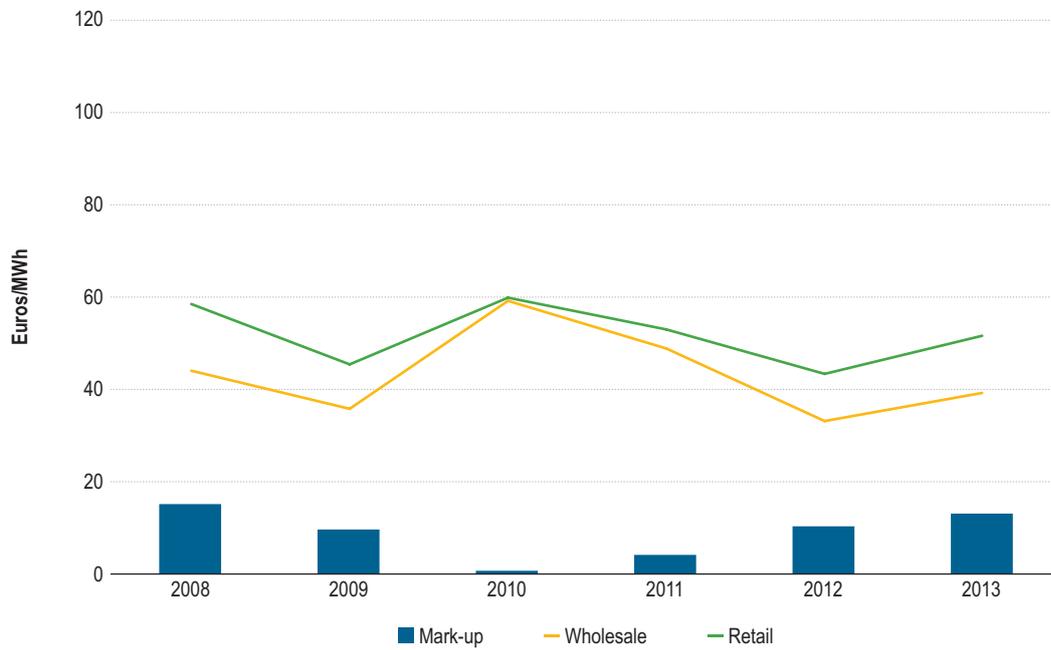
Luxembourg



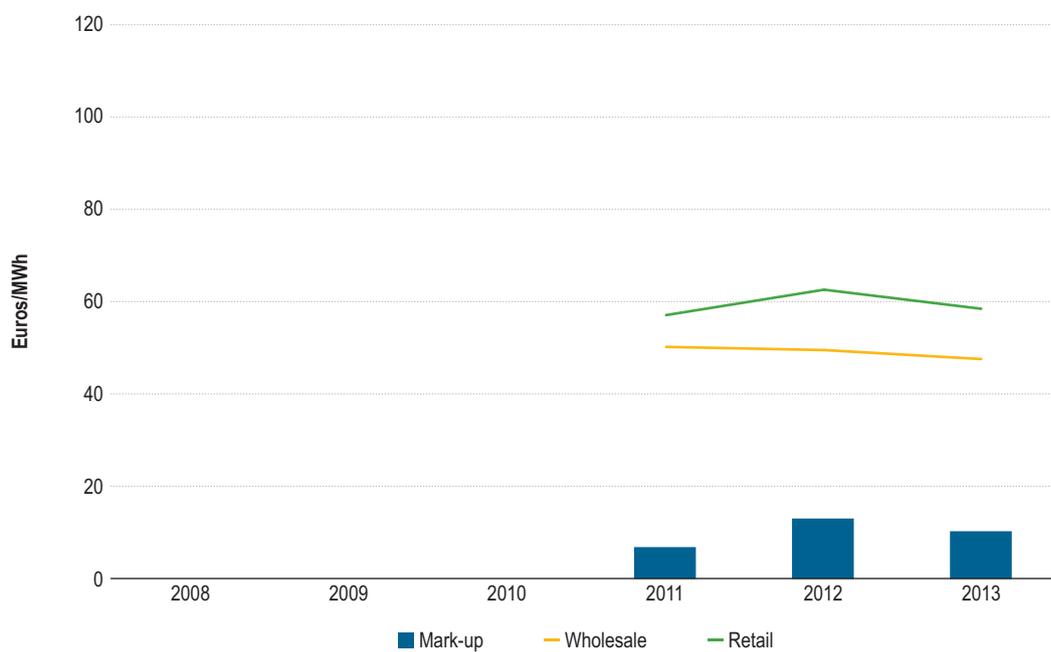
Netherlands



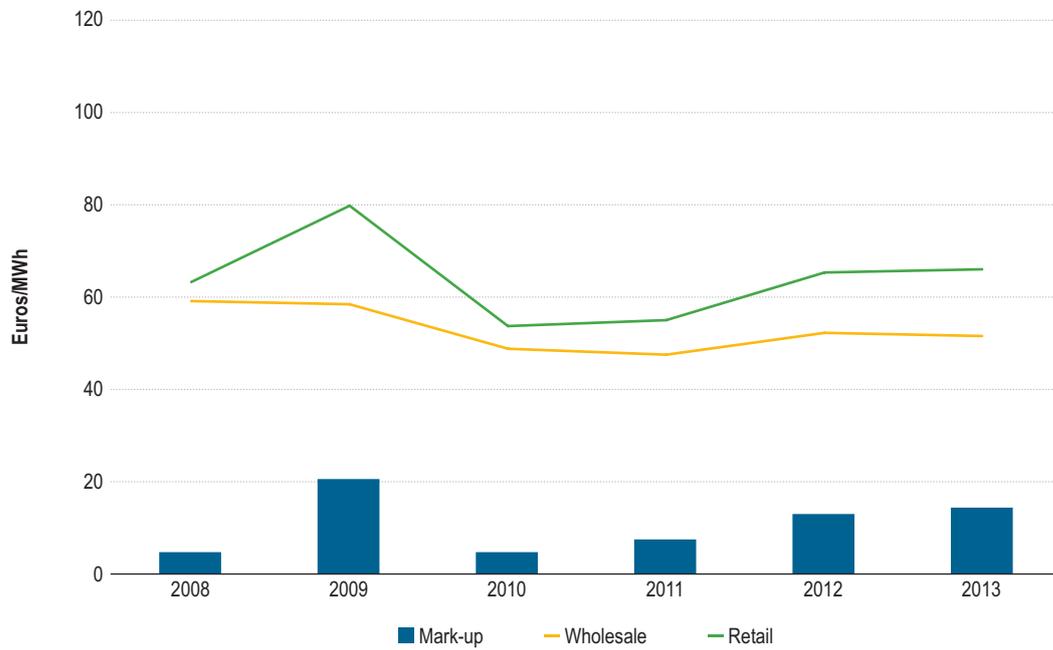
Norway



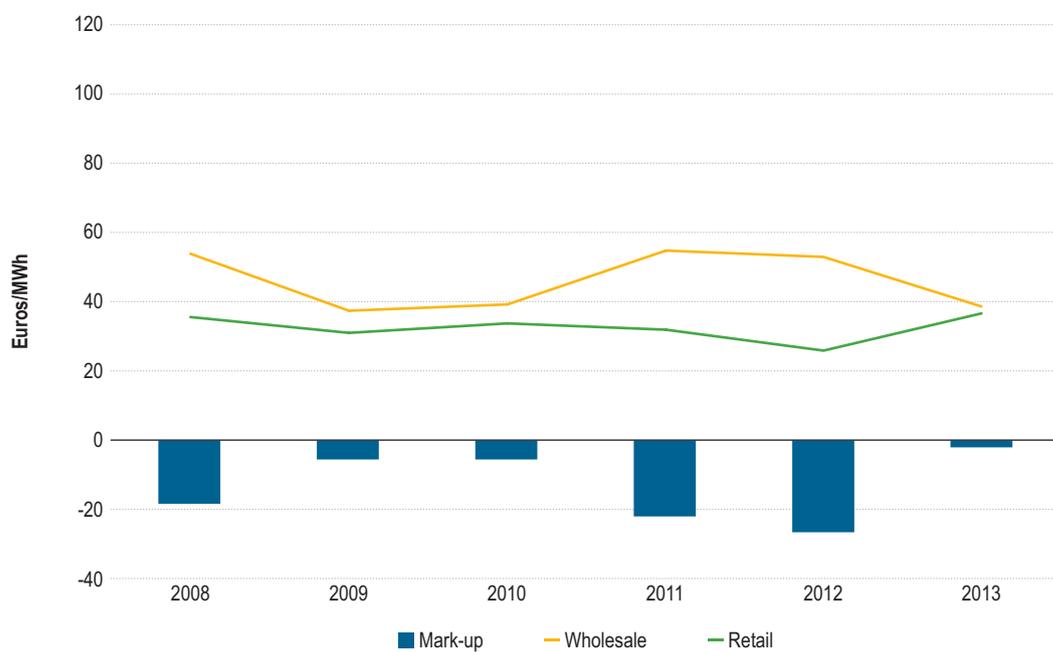
Poland



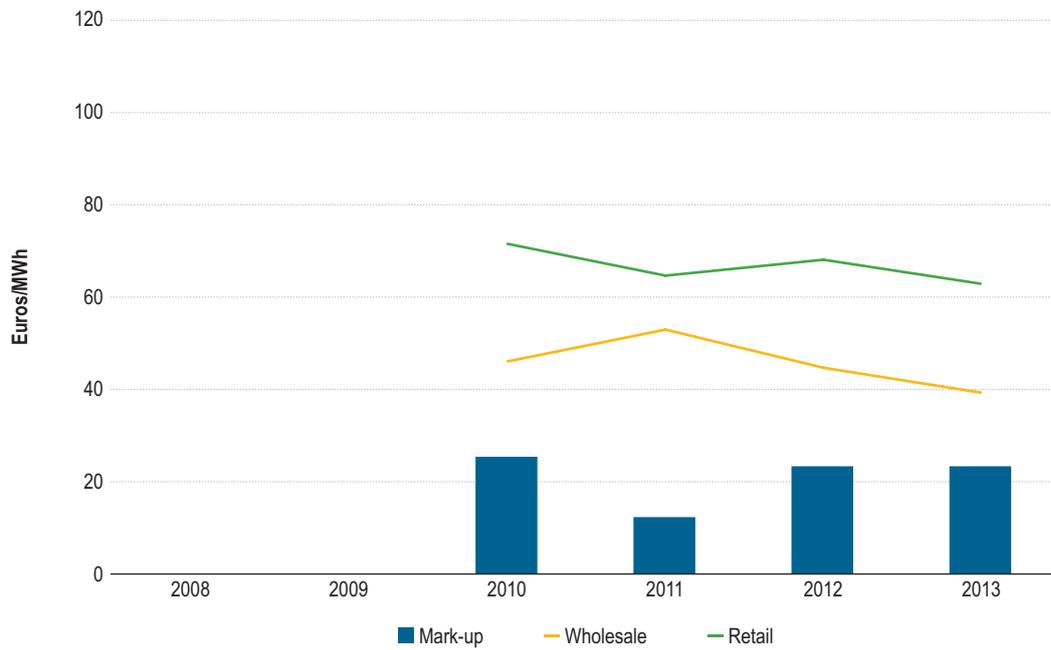
Portugal



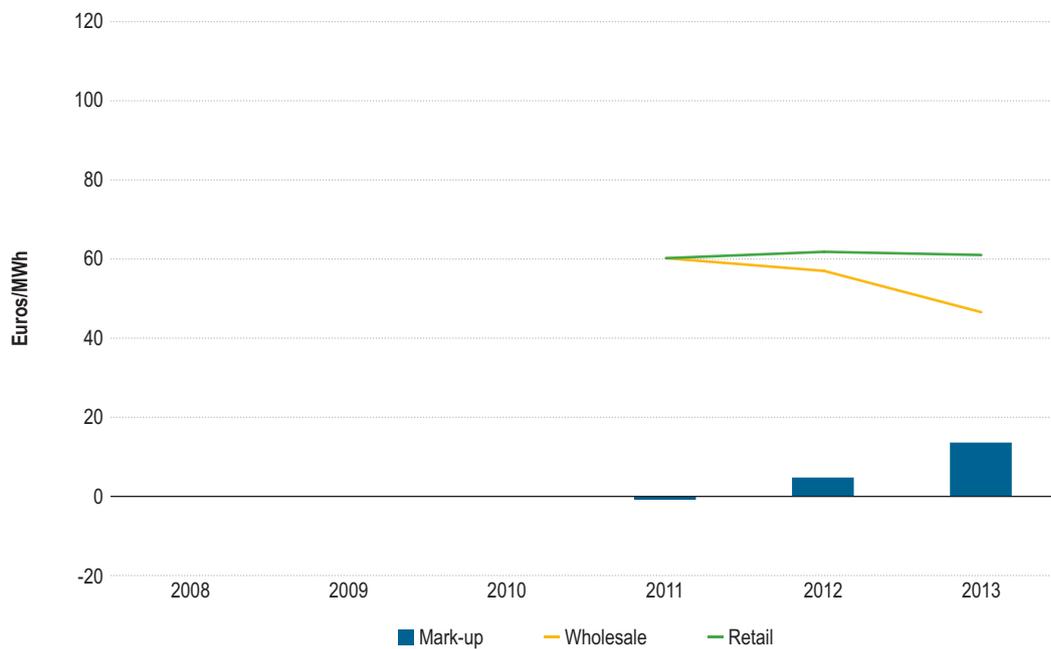
Romania



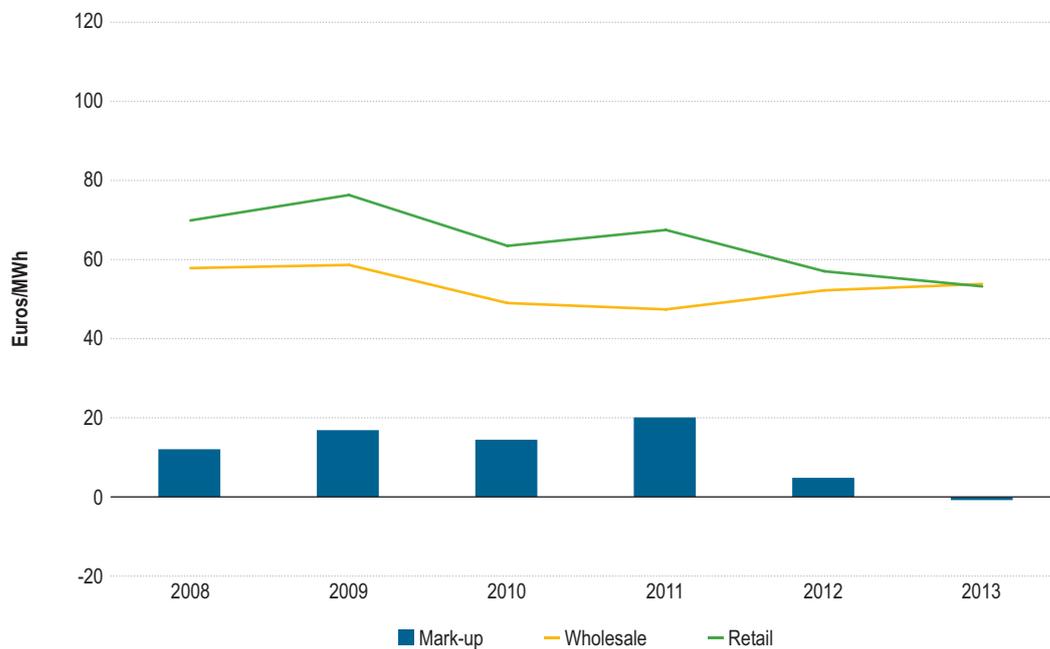
Slovakia



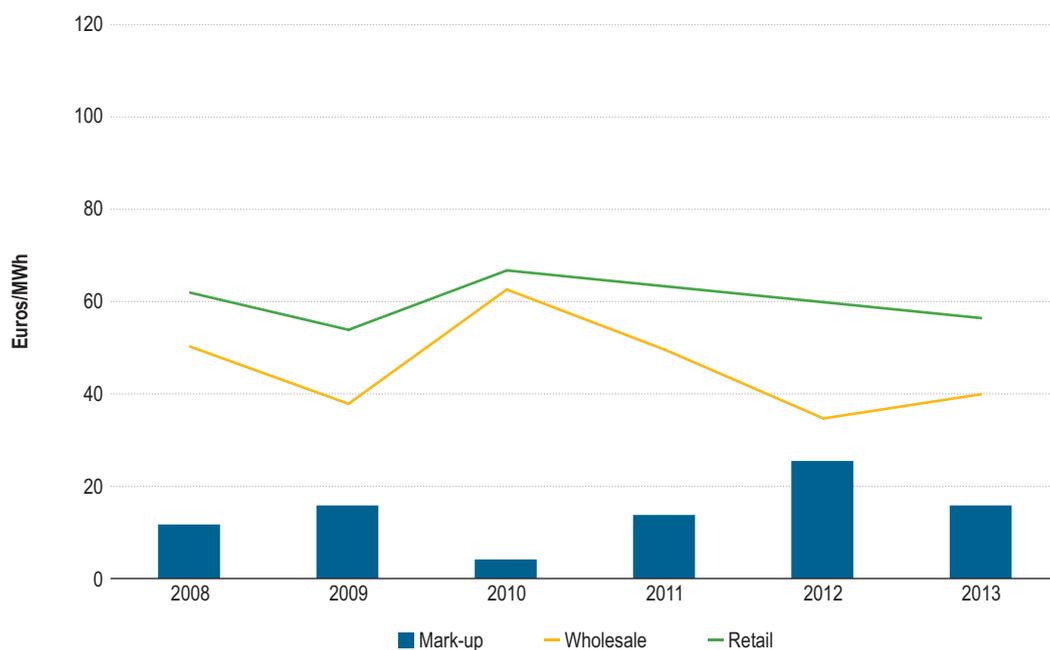
Slovenia



Spain



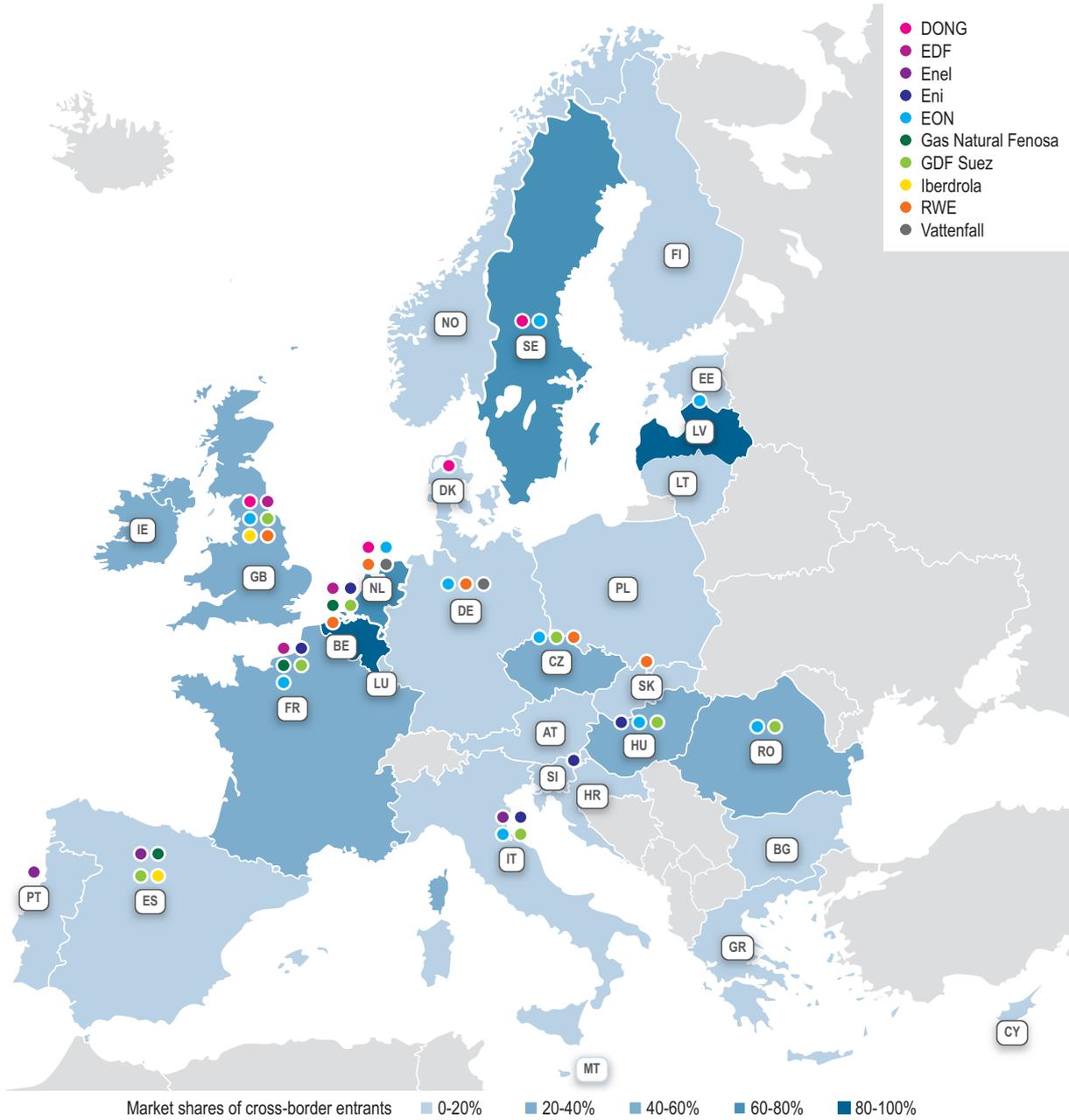
Sweden



Source: NRAs and European power exchanges data (2014) and ACER calculations

Annex 3: Presence of major gas suppliers in Europe

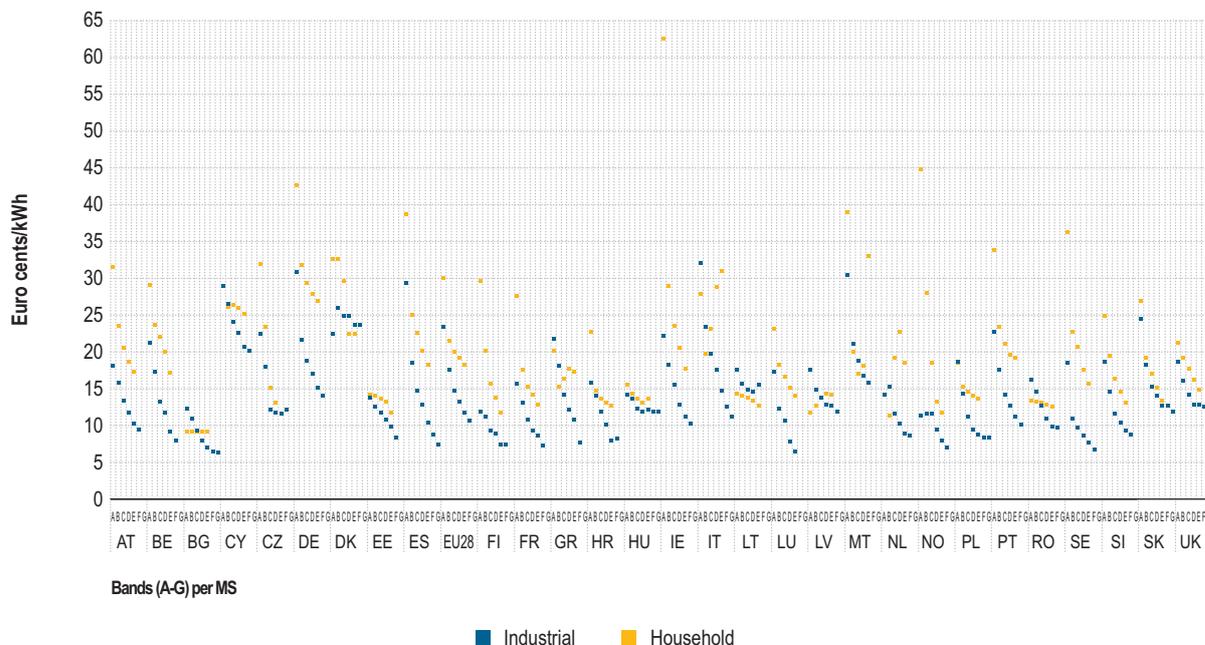
Figure A 4: Presence of major gas suppliers in Europe and market shares of cross-border entrants – 2013



Source: ACER analysis based on Datamonitor's data

Annex 4: Electricity and gas household and industrial consumer price levels per MS

Figure A 5: Electricity household and industrial consumer price levels per MS per band (euro cents/kWh)



Source: ACER, based on Eurostat (21/7/2014)

Notes: Dutch electricity prices for household consumer band DA are not applicable, as a special annual refund per connection would result in unrealistic national prices for this band. For large industrial end-users (band IF), prices are not applicable for Malta and Luxembourg, and not available for Ireland (confidential). Prices for Band IG are not available for a few countries, as the price data for this band are declared on a voluntary basis. Source: http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/FR/nrg_price_esms.htm.

Figure A 5 shows electricity 2013 price levels (euro cents/kWh) per household and industrial consumer band. The price for electricity per kWh varies according to total annual electricity consumption. These consumption levels are categorised in 'bands' for both the household and industrial sector.

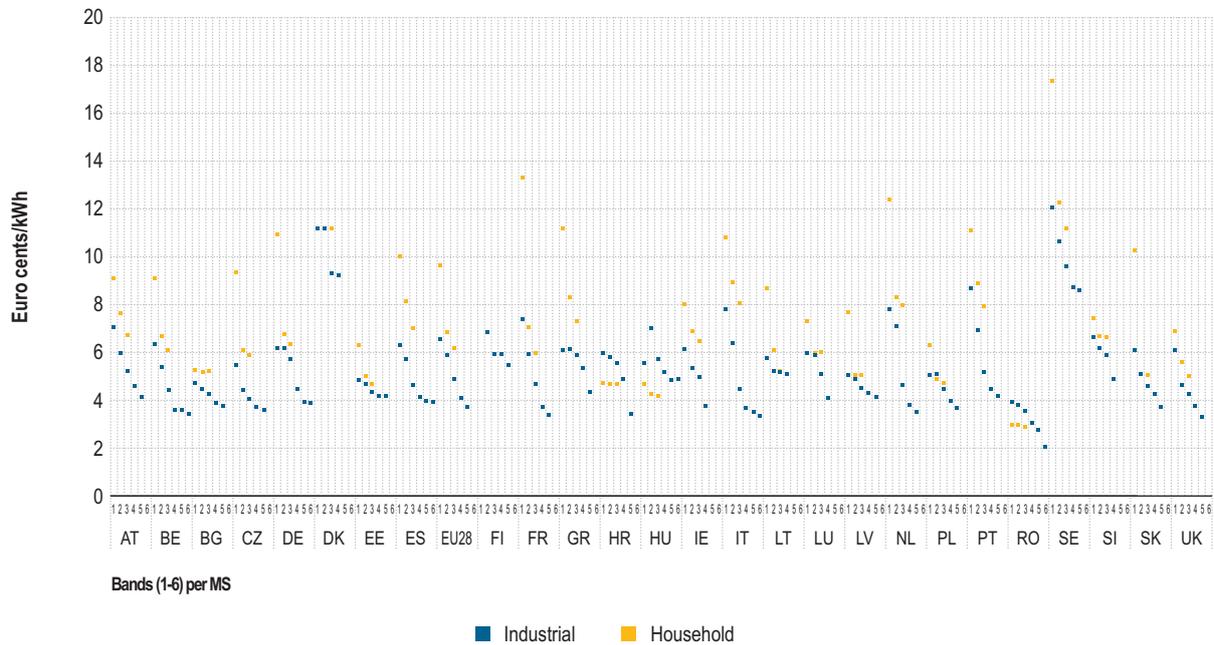
The household sector has five bands, ranging from DA to DE: DA: consumption < 1,000 kWh;

- DB: 1,000 kWh < consumption < 2,500 kWh;
- DC: 2,500 kWh < consumption < 5,000 kWh;
- DD: 5,000 kWh < consumption < 15,000 kWh;
- DE: consumption > 15,000 kWh.

The industrial sector has seven bands, ranging from IA to IG:

- IA: Consumption < 20 MWh;
- IB: 20 MWh < consumption < 500 MWh;
- IC: 500 MWh < consumption < 2,000 MWh;
- ID: 2,000 MWh < consumption < 20,000 MWh;
- IE: 20,000 MWh < consumption < 70,000 MWh;
- IF: 70,000 MWh < consumption < 150,000 MWh;
- IG: consumption > 150,000 MWh.

Figure A 6: Gas household and industrial consumer price levels per MS per band (euro cents/kWh)



Source: ACER, based on Eurostat (21/7/2014)

Notes: Due to the limited size of the natural gas markets in Finland (households), Cyprus, and Malta, data for these countries are not available or only partially available. Prices for large industrial end-users (band I5) are not applicable for Luxembourg, and confidential for Ireland and Slovenia. Prices for Band I6 (annual consumption above 4,000,000 GJ) are not available for a few countries, as the price data for this band are declared on a voluntary basis.

Figure A 6 shows gas 2013 price levels (euro cents/kWh) per household and industrial consumer band. The price of gas per kWh varies according to the total amount of gas consumed per year. These consumption levels are categorised in ‘bands’ for both the household and industrial sector.

The household sector has three bands, ranging from D1 to D3:

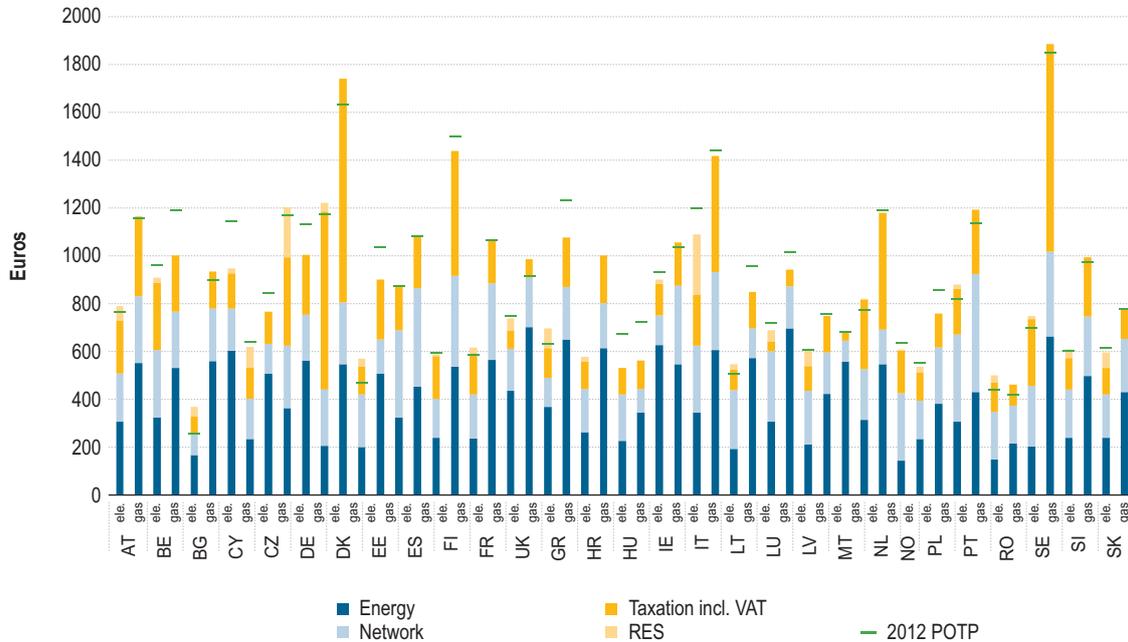
- D1: consumption < 20 GJ;
- D2: 20 GJ < consumption < 200 GJ;
- D3: consumption > 200 GJ.

Six bands are used for gas consumption in the industrial sector, ranging from I1 to I6:

- I1: consumption < 1,000 GJ;
- I2: 1,000 GJ < consumption < 10,000 GJ;
- I3: 10,000 GJ < consumption < 100,000 GJ;
- I4: 100,000 GJ < consumption < 1,000,000 GJ;
- I5: 1,000,000 GJ < consumption < 4,000,000 GJ;
- I6: consumption > 4,000,000 GJ.

Annex 5: Electricity and gas household price break-down

Figure A 7: 2013 POTP electricity and gas break-down and comparison with the 2012 price – incumbents’ standard offers for households in capital cities – November– December 2013 (%)



Source: ACER Retail Database and information from NRAs (2013)

Annex 6: RES charges for industrial and household consumers

Table A 3: RES Charges for Industrial and Household consumers, EU-28. (Charges per Eurostat band (euros/MWh) unless a different categorisation applies).

MS/ Band	Industrial consumers in general are obliged to pay RES charges	Categories compatible with Eurostat bands	Charges per Eurostat band (euros/MWh)							Additional information	RES Charges for household consumers (Based on ACER Retail Database)	
			IA (<20 MWh)	IB (20 – 500 MWh)	IC (500–2,000 MWh)	ID (2,000–20,000 MWh)	IE (20,000–70,000 MWh)	IF (70,000–150,000 MWh)	IG (>150,000 MWh)			
AT	YES	Yes	not yet available	not yet available	not yet available	13,597 EUR per MWh	not yet available	not yet available	not yet available	not yet available	14,77 euros/MWh	
BE	YES	Yes for RES paid through the network.	2,35 euros/MWh	5.5 euros/MWh	Industrial consumers pay a RES charge through the transmission network charges, depending on the region in which they are located: Flanders: 2,8699 euros/MWh, Brussels: 2,3528 euros/MWh, Walloon region: 16,1687 euros/MWh. The cost of RES-obligations imposed on suppliers is included in the energy component. For large industrial consumers no average euros/MWh can be given, since this is part of the negotiated energy price in the supply contract.							
BG	YES		9,6 euros/MWh									
CY	YES		5,0 euros/MWh									
CZ	YES	Yes	21,18 euros/MWh	21,32 euros/MWh								
EE	YES	Yes	8,7 euros/MWh	Expected to fall to 0,77 euros/MWh in 2014.								
FI	YES		0,925 euros/MWh	20 euros/MWh								
FR	YES It depends on the company's consumption.		Cannot say	7,94 euros/MWh	All industrial consumers are obliged to pay a CSPE charge, which includes RES charges. CSPE is capped at 569,418 euros. CSPE should not exceed 0,5% of the added value for industrials consuming more than 7,000 MWh.							
GR	YES		1,79 euros/MWh (HV) and 8,87 euros/MWh (MV)	20,8 euros/MWh	An annual cap of 991,000 euros applies per consumption site. In 2013, only 2 large industrial sites are actually estimated to have reached this cap.							
HR	YES	Yes	4,58 euros/MWh	4,65 Euro/MWh	Customers that have the obligation to acquire a permit for greenhouse gas emissions (regulated by other legislation) are obliged to pay 0,005 HRK/kWh (0,66 Euro/MWh). This is irrespective of consumption, but depends on the type of activity.							
HU	YES	Yes	0,127 euros/MWh	0 Euro/MWh	RES is charged to customers not entitled to universal supply (connection capacity exceeding 3 x 63 amperes).							

MS/ Band	Industrial consumers in general are obliged to pay RES charges	Categories compatible with Eurostat bands	IA (<20 MWh)	IB (20 – 500 MWh)	IC (500–2,000 MWh)	ID (2,000–20,000 MWh)	IE (20,000–70,000 MWh)	IF (70,000–150,000 MWh)	IG (>150,000 MWh)	Additional information	RES Charges for household consumers (Based on ACER Retail Database)
IE	YES. It depends on maximum import capacity.	Small commercial customers: maximum import capacity => 30kVA: 18,47 euros/kVa <30kVA: 129,83 euros	74.6 euros/MWh	53.2 euros/MWh	45.6 euros/MWh	44.6 euros/MWh	40.3 euros/MWh	30.0 euros/MWh	17.0 euros/MWh		4.39 euros/MWh
IT	YES	Yes	5.585 euros/MWh	5.585 euros/MWh	5.585 euros/MWh	5.585 euros/MWh	5.585 euros/MWh	5.585 euros/MWh	5.585 euros/MWh		63.22 euros/MWh
LT	YES	No. Different categories	11.4 euros/MWh Category A (= < 25 MWh/year)	3.8 euros/MWh Category B > 25 MWh / year (unless they apply for Category C)	0.75 euros/MWh. Category C: =>20,000 MWh or connected to 65 kV grid or being classified as a large consumer						11.4 euros/MWh
NL	YES	No. Different categories	1st Cat: <10 MWh: 1.10 euros/MWh	2nd Cat: 10 MWh-50 MWh: 1.40 euros/MWh	3rd Cat: 50 MWh-10,000 MWh: 0.4 euros/MWh	4th Cat: >10,000 MWh: 0.017 euros/MWh				RES charges are expected to increase as follows: 1st Category: 2.3 euros in 2014, 3.6 euros in 2015 and 5.6 euros/MWh in 2016; 2nd Cat: 2.7 euros in 2014, 4.6 euros in 2015 and 7.0 euros/MWh in 2016; 3rd Cat: 7.0 euros in 2014, 1.2 euros in 2015, 1.9 euros/MWh in 2016; 4th Cat: 0.034 euros in 2014, 0.055 euros in 2015 and 0.084 euros/MWh in 2016.	1.1 euros/MWh
PT	It depends on the voltage level.		VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh	VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh	VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh	VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh	VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh	VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh	VHV –0.00 euros/MWh, HV –0.00 euros/MWh, MV –0.02 euros/MWh		4.65 euros/MWh
RO	YES		8.1 euros/MWh	8.3 euros/MWh	8.44 euros/MWh	7.7 euros/MWh	8.3 euros/MWh	7.4 euros/MWh	-		7.62 euros/MWh
SI	YES. It depends on contracted power, voltage level, category of supply and the purpose of the electricity usage.		Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	The price ranges from 9.713 euros/kWh/year to 48.726 euros/kWh/year.	8.83 euros/MWh
SK	YES	Yes	16.04 euros/MWh	16.04 euros/MWh	16.04 euros/MWh	16.04 euros/MWh	16.04 euros/MWh	16.04 euros/MWh	16.04 euros/MWh	The RES charge is a component of the "TPS charge" (Tariff for Operation of the System)	16.02 euros/MWh

MS/ Band	Industrial consumers in general are obliged to pay RES charges	Categories compatible with Eurostat bands	IA (<20 MWh)	IB (20 – 500 MWh)	IC (500–2,000 MWh)	ID (2,000–20,000 MWh)	IE (20,000–70,000 MWh)	IF (70,000–150,000 MWh)	IG (>150,000 MWh)	Additional information	RES Charges for household consumers (Based on ACER Retail Database)
DE	YES with exemptions, depending on an individual company's consumption.		52.77 euros/MWh	52.77 euros/MWh	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	All companies pay 52.77 euros/MWh up to their 1,000 MWh consumed. Thereafter the RES charge depends on a) exemptions with regard to the type of industry in which a company is involved (manufacturing, railway, electricity costs at least 14 per cent of gross value etc.) if approved by BAFA. Depending on the exemption level, RES charges for MWh consumed in addition to the first 1,000 MWh are calculated.	52.77 euros/MWh
DK	YES with exemptions. Estimated at 8.5% of the final price.	No.	-	-	-	-	-	-	-	RES charges depend on the consumption of the company in question. Based on the hourly Nord Pool Spot prices, the RES charge is estimated at 8.5% of the final price for industrial electricity consumers.	8.71 euros/MWh
NO	YES with exemptions		1.42 euros/MWh	1.42 euros/MWh	1.42 euros/MWh	1.42 euros/MWh	1.42 euros/MWh	1.42 euros/MWh	1.42 euros/MWh	Exemptions relate to the type of electricity consumption among other factors.	1.48 euros/MWh
PL	YES with exemptions		Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Industrial end-users who use more than 100,000 MWh of electricity annually, are obliged to buy green certificates for 13% (in 2014, in 2013 – 12%) of all energy they sell to end-users: - up to 20% of the energy they use for their own production if the cost of energy is greater than 12% of the value of their production; - up to 60% of the energy they use for their own production if the cost of energy amounts to 7 to 12% of the value of their production; - up to 80% of the energy they use for their own production if the cost of energy amounts to 3 to 7% of the value of their production. As of September 2013, some big industrial end-users who are entitled to exemptions can fulfil the RES support obligation by themselves at a reduced amount were obliged to buy energy from the seller encumbered with green certificates.	6.13 euros/MWh
SE	YES with exemptions for energy intensive industries.		3.01 euros/MWh	3.01 euros/MWh	3.01 euros/MWh	3.01 euros/MWh	3.01 euros/MWh	3.01 euros/MWh	3.01 euros/MWh	Exemptions exist for electricity intensive industries.	3.06 euros/MWh
UK	YES with exemptions		Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	Cannot say	RES charges for industrial consumers are comprised of Renewable Obligation Certificates (ROCs) (10.6 euros/MWh), the Climate Change Levy (CCL) (6.39 euros/MWh) and the Levy Exemption Certificates (LECs) ¹¹ (depending on the certificates and their price on the market), the Feed-in-Tariffs (FITs) (in total 522.76 million euros are estimated to be paid by all industrial consumers) and the Price Carbon Floor (PCF) (included in the direct fuel cost and therefore already reflected in the wholesale cost).	12.83 euros/MWh

Source: ACER Retail Database and information from NRAs (2013)

Annex 7: List of price comparison websites from which offers were obtained

Table A 4: Price comparison websites for the offer data analysis

Country	Electricity	Gas
AT	http://www.e-control.at/haushalts-tarifkalkulator	http://www.e-control.at/haushalts-tarifkalkulator
BE	http://www.brusim.be/	http://www.brusim.be/
BE	Information from NRA	Information from NRA
HR	https://kompare.hr/	Supplier's site: http://www.gpz-opskrba.hr/
CZ	http://kalkulator.eru.cz/	http://www.cenyenergie.cz
CY	Information from NRA	n.a.
DK	http://www.elpristavlen.dk/	http://gasprisguiden.dk
EE	https://minuelekter.ee/calc	Supplier's site: http://www.gas.ee
FI	http://www.sahkonhint.fi/	http://www.gasum.fi/Yksityisille/Kodin-lammitys/hinnastot/
FR	www.energie-info.fr	www.energie-info.fr
DE	www.verivox.de	www.verivox.de
GR	NRA	http://www.aerioattikis.gr/default.aspx?pid=34&la=1&artid=135
HU	Information from NRA and other offers from 3 suppliers	http://www.vasarlocsapat.hu
IE	http://www.bonkers.ie/compare-gas-electricity-prices/electricity/	http://www.bonkers.ie/compare-gas-electricity-prices/gas
IT	http://trovaofferte.autorita.energia.it/	http://trovaofferte.autorita.energia.it/
LV	Information from NRA	Information from NRA
LT	Information from NRA	Information from NRA
LU	http://www.ilr.public.lu/stroumagas/comparaison_des_prix/index.html	http://www.ilr.public.lu/gaz/fournisseurs/
MT	Information from NRA	n.a.
NL	http://www.energieleveranciers.nl/energie-vergelijken	http://www.easyswitch.nl/energie
NI	http://www.consumerCouncil.org.uk/energy/price-comparison/	n.a.
NO	http://www.konkurransetilsynet.no/en/Electricity-prices/Check-power-prices/	n.a.
PL	http://ure.gov.pl/ftp/ure-kalkulator/ure/formularz_kalkulator_html.php	Information from NRA
PT	http://www.erse.pt/ / Simulador de Preços de Energia Elétrica	http://www.erse.pt/ / Simulador de Preços des Gas Natural
RO	Information from NRA	Information from NRA
SK	http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/KalkulackaElektrinaNewWeb	http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/KalkulackaPlynNewWeb
SI	http://www.agen-rs.si/primerjalnik/index.php?/kalkulatorelektrika/kalkulator/action/IzbiraOdjemalca/redirected/1/	http://www.agen-rs.si/primerjalnik/index.php?/kalkulatorplin/kalkulator/action/korak2/redirected/1/
ES	http://comparadorofertasenergia.cnmc.es/comparador/	http://comparadorofertasenergia.cnmc.es/comparador/
SE	http://www.ei.se/elpriskollen/	Individual suppliers' offers
UK	http://www.ukpower.co.uk/	http://www.ukpower.co.uk/

Source: ACER, November–December 2013

Annex 8: Survey of estimates of values of DSF

Table A 5: Survey of estimates of values of implicit DSF in electricity (euros/kW/yr)

Source	Scope	Metric	Benefit	Origin of benefit	Comment
EC COM(2014) 356, <i>Benchmarking smart metering deployment in the EU-27 with a focus on electricity</i>	EU	billion euros NPV	23 billion NPV	Net smart metering benefits projected in CBA studies, including administrative savings, net of metering and operating costs	Total projected by CEPA from study result of euros 86 per metering point. Many MSs appear to have been unambitious in relation to the uptake of DSF methods.
		euros/kW/year of peak demand	3/kW/yr	Gross energy savings (only), arising from assorted smart metering programs varying by MS. Includes demand reduction due to greater awareness of consumption, and other measures mostly likely to focus on implicit DSF.	Amount projected by CEPA from study result of average 3% energy saving. This 3% is likely to apply to the newly metered customers, not the whole market. This level is consistent with greater awareness of usage and simple ToU tariffs.
		% peak load shift	1% to 10%		
A Faruqi, D Harris and R Hledik (2009), <i>Unlocking the euros53 Billion Savings from Smart Meters in the EU</i> , The Brattle Group	EU	euros/kW/year of peak demand	2 to 12/kW/yr	Gross energy and network benefits from smart metering, mostly implicit DSF, excluding administrative benefits and smart metering costs	In the low cases, a net loss is made after costs of metering and admin benefits. Achieving the high case is contingent upon high level of consumer engagement.
Bradley P., M. Leach and J. Torriti (2013) <i>A Review of the Costs and Benefits of Demand Response for Electricity in the UK</i>	UK	euros/kW/year of peak demand	6/kW/year	Gross energy benefits from smart metering schemes, mostly implicit DSF, excluding administrative benefits and smart metering cost. Also includes resistive loss savings and environmental savings from CO ₂ abatement.	GB is the most optimistic of the EU MSs in relation to the overall financial benefits of smart metering, albeit that energy reduction projections in the UK from smart metering are less than the 3% average in MSs' CBAs.

Source: Literature survey undertaken on behalf of ACER (2014)

Table A 6: Survey of estimates of values of explicit DSF in electricity – (euros/kW/yr)

Source	Scope	Metric	Benefit	Origin of benefit	Comment
Capgemini (2008), Demand Response: a decisive breakthrough for Europe	EU-15	euros/kW/yr of peak demand	up to 60/kW/yr	Net benefits of DSF, from all kinds of schemes, explicit and implicit, to 2020	Inconsistent with the results of other studies.
Source: Booz & Company (2013), Benefits of an Integrated European Energy Market	EU (approx.)	euros/kW/yr of peak demand	6 to 10/kW/yr	Net benefits of DSR to balance supply and demand to 2030, taking into account a fully integrated market with optimal interconnection	Much greater savings potential if full market integration and optimal interconnection levels are delayed
EWI (2012), Flexibility options in European electricity markets in high RES-E scenarios	EU (approx.)	% of peak demand in 2050	10%	Potential size of explicit DSR resource by 2050, employed to balance supply and demand in a future high wind low carbon future	The 10% is intended to be an achievable level based on a potential level of 18%. Can be compared with the 10% demand resources already available in some parts of the USA.
H Gils (2014), Assessment of the theoretical demand response potential in Europe, Energy 67 (2014) 1-18	Europe (broader than EU)	% of peak demand	14%	Potential size of the explicit DSR resource	Total potential size, without regard for a trajectory of achievability as in EWI (2012)
dena (2010), Grid Study II – Integration of Renewable Energy Sources in the German Power Supply System from 2015 – 2020 with an Outlook to 2025	Germany	euros/kW/yr of peak demand	6/kW/yr	Net system benefit of explicit DSR to balance supply and demand, mainly from avoiding capital costs of flexible plant and T&D, and reducing wind curtailment	Amount projected by CEPA from euros500m/year total in study. Study assesses appropriate amounts of DSR against other sources of flexibility, capped by available amount.
S Feuerriegel and D Neumann (2014), Measuring the financial impact of demand response for electricity retailers, Energy Policy 65, 359–368	Germany	euros/kW/yr of peak demand	12/kW/yr	Some net benefits of explicit DSR to balance supply and demand	Implausible quantity of DSR resource by comparison with other studies, and only partial estimate of benefits

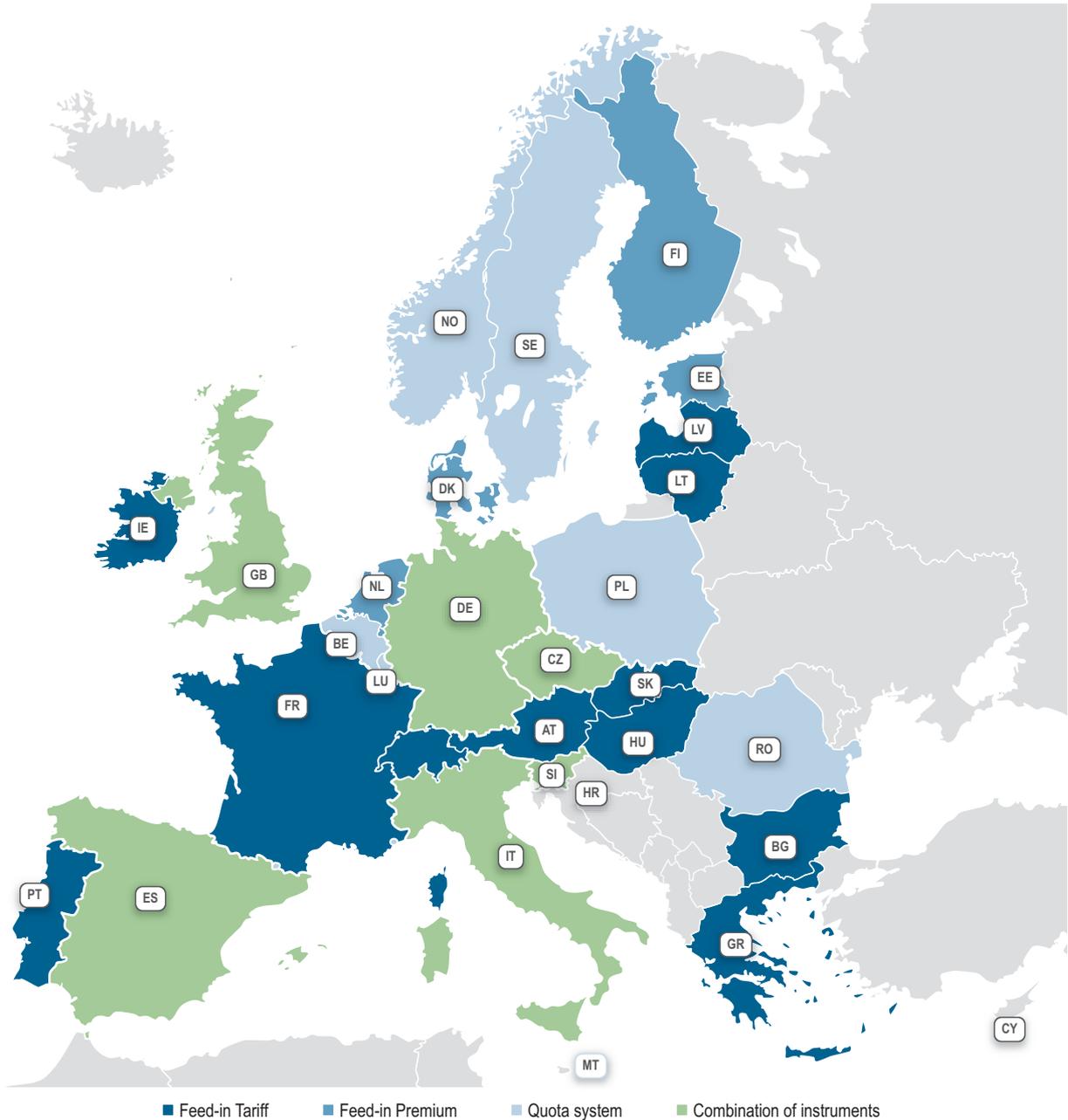
Source	Scope	Metric	Benefit	Origin of benefit	Comment
Bradley P., M. Leach and J. Torriti (2013) A Review of the Costs and Benefits of Demand Response for Electricity in the UK	UK	euros/kW/yr of peak demand	0.5 to 19/kW/yr	Net benefits of explicit DSR to balance supply and demand, and reduce or eliminate involuntary curtailments	The value in balancing supply and demand mostly arises as wind power grows from its present level, which GB currently has sufficient flexibility to cope with. No estimate was made of what proportion of customer involuntary curtailments DSR could practically avoid.
Imperial College London (2012), Understanding the Balancing Challenge, Study for Department of Energy and Climate Change	UK	euros/kW/yr of peak demand	1 to 92/kW/yr	Net benefits of explicit DSR to balance supply and demand in the context of high intermittency in generation and decarbonisation of energy usage	Makes clear that if other flexibility technologies are thoroughly used, the value of DSR can be low, though also dependent upon other factors. DSR becomes exceedingly valuable for balancing if those other sources of flexibility are restrained, or in particular demand conditions.
US Department of Energy (2006): Benefits of demand response in electricity markets and recommendations for achieving them	USA (various zones)	euros/kW/yr of peak demand (gross)	0.5 to 6.4/kW/yr	Net benefits of explicit DSR to balance supply and demand, as found collated from seven studies of prospects for DSR	The normalised amount compares the above on the basis of a 10% take-up of DSR, and corrects for some other study differences
		euros/kW/yr of peak demand (normalised)	0.7 to 1.5/kW/yr		
Brattle Group (2007), Quantifying Demand Response Benefits In PJM	PJM (part), USA	euros/kW/yr of peak demand	1.2 to 2.4/kW/yr	Net benefits of explicit DSR delivering a 3% reduction in peak demand	In practice the DSR resource available to some US markets is up to 10% of their peak demand

Source: Literature survey undertaken on behalf of ACER (2014)

Note: During the proofing period of this report, DG-ENER published KEMA, Imperial College and NERA (2014), *Integration of Renewable Energy in Europe*. It reports the result of modelling two scenarios (low and high) for the increased use of explicit DSR, to estimate the potential savings in the costs of additional transmission capacity needed in the EU by 2030 for renewables integration. This resulted in an estimate of around euros10 billion to euros15 billion per year (euros20/kW/yr to euros30/kW/yr). The model result is shown only in graphical form at Fig 129 of that report, hence the approximate nature of the figures reported here.

Annex 9: Overview of primary national RES support regimes in Europe

Figure A 8: Overview of primary national RES support schemes

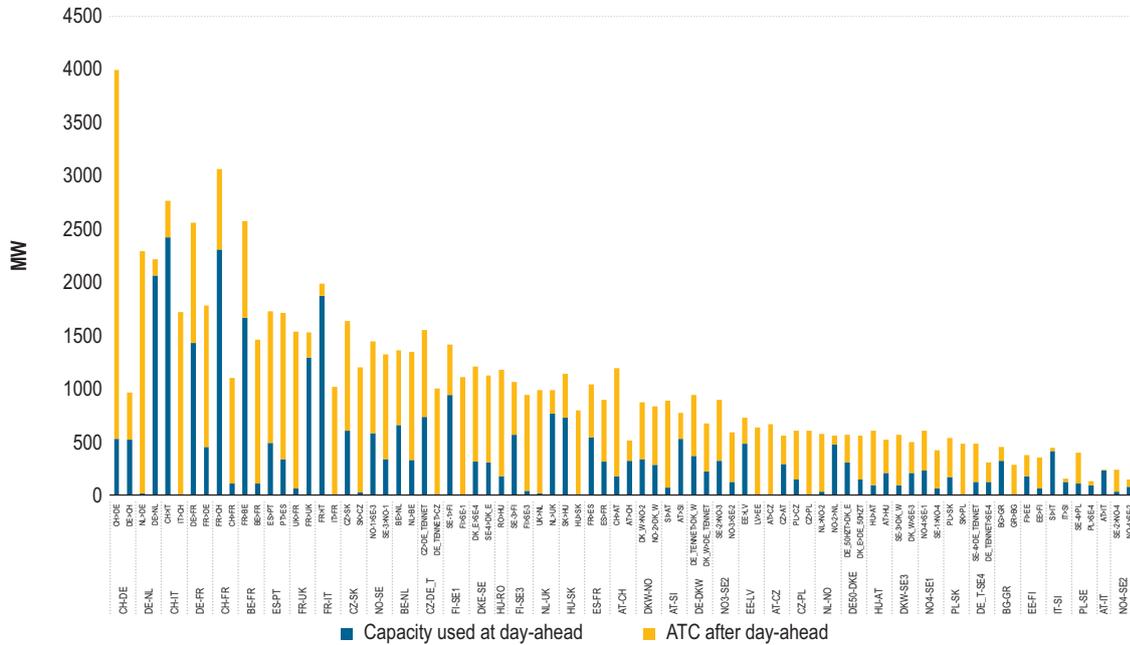


Source: RES Legal (2014), available on: <http://www.res-legal.eu>

Note: The map shows the main support instrument in each member state based on three general categories and a combination of these three. Tax incentives, loans and other forms of support measures are not included in the map.

Annex 10: Average available transfer capacity after day-ahead gate closure per border

Figure A 9: Average available transfer capacity after day-ahead gate closure per border – 2013 (MW)



Source: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2014) and ACER calculations

Annex 11: Methodological note on the calculation of the potential for imbalance netting, exchange of balancing energy and benefits that can be achieved from the integration of balancing energy markets

This annex explains the scope and methodology used in Section 3.3.1 to calculate the potential for imbalance netting, exchange of balancing energy and benefits per border that can be achieved from the integration of balancing energy markets.

The methodology does not intend to provide a precise estimate of the social welfare gains that could be achieved by integrating balancing markets. Instead, it is intended to provide a rough estimate (at least an order of magnitude) of the potential efficiency gains per border.

The benefits can be seen either from the perspective of the TSOs (if they can procure balancing energy at a lower price) or from the perspective of the BRPs (if they incur lower costs for their imbalances, being those costs equal to the volumes of their imbalances multiplied by the corresponding imbalance price). Both approaches should yield similar results, provided the imbalance prices reflect the prices of the balancing energy necessary to keep the system in balance, as explained below.

The imbalance settlement can (typically) be done either through a one-price or two-price system as summarised in Table A 7.

Table A 7: Imbalance settlement through typical one-price and two-price systems

Imbalance settlement through a typical one-price system			
		System Imbalance	
		Short	Long
BRP Imbalance	Short	+BPu	+BPd
	Long	-BPu	-BPd

Imbalance settlement through a typical two-price system			
		System Imbalance	
		Short	Long
BRP Imbalance	Short	-BPu	+ PDA (or linked to PDA)
	Long	-PDA (or linked to PDA)	-BPd

Source: ACER based on Impact Assessment on European Electricity Balancing Market (Contract EC DG ENER/B2/524/2011), Final Report (2013)

Notes: BPu= price of upward energy regulation, BPd= price of downward energy regulation, PDA=Day-ahead Power Exchange price.

In either the one-price or two-price mechanisms, when a system is short of energy, the imbalance price for 'short' BRPs can be considered a good proxy for the price at which TSOs procure upward balancing energy. Similarly, when a system is 'long', the imbalance price for 'long' BRPs can be understood as a proxy for the downward balancing energy. If TSOs were allowed to procure balancing energy in any of the adjacent markets, they could save money by, first, applying imbalance netting and, second, procuring the remaining need for balancing energy at the cheapest possible price. Those savings would then be transferred to

BRPs. Therefore, the potential savings can also be calculated by considering that BRPs are charged the lowest imbalance price across adjacent markets. This was the approach taken for this analysis. As explained in Section 3.3.1, due to the diverging national imbalance settlement mechanisms, the results of the calculations provide an indication of both the potential for further harmonisation of imbalance settlement pricing and the potential for the exchange of balancing energy.

The calculations were made with a two-step approach. First, the potential for imbalance netting subject to cross-border capacity calculations was computed. Second, based on the remaining system imbalances and the resulting cross-border capacity after the imbalance netting, the potential for further exchange for balancing energy (and its associated efficiency gains) is calculated.

To apply the above outlined methodology, a number of assumptions were made:

- The estimates assumed the deepest possible integration of balancing markets, i.e. the sharing of a full CMO list and includes the imbalance netting and the exchange of balancing energy from all types of balancing reserves.
- The analysis considered only those gains that could be achieved by netting imbalances or by exchanging balancing energy. Savings obtained from the exchange of balancing reserves have not been considered due to the limited data available and to the fact that the incurred costs to procure balancing reserves are often recovered aside from the imbalance settlement mechanism. This aspect, if neglected, may lead to an underestimate of the potential efficiency gains compared to a situation where balancing reserves are also exchanged.
- The estimates assumed 'all else being equal' and do not, in particular, consider the impact on the behaviour (their bids and offers) of market participants in organised markets following the application of imbalance netting and exchange of balancing energy. In addition, they do not take account of market resilience, i.e. the impact on prices of altering the volumes exchanged. This could be estimated precisely only by applying aggregated curves of supply and demand in each market and for all the exchangeable balancing products. This effect, if neglected, may lead to an overestimate of the potential savings.
- The estimates do not take account of the effect of simultaneity, i.e. when system imbalances are netted with an adjacent system (or balancing energy is exchanged) for a given ISP, the same process should not be simultaneously applied with a third neighbouring system. In reality, this would need an optimisation process to identify where imbalance nettings (or exchanges of balancing energy) are more valuable.
- The analysis does not take account of the various energy products from different types of reserves and their different weight across MSs in the respective imbalance prices. This would require having access to and processing million data points corresponding to all the different balancing energy products of all the imbalance areas that are relevant for the analysis.
- The analysis makes use of the net system imbalances. It is assumed that all out-of-balance BRPs deviate from their schedule in the same direction as the system. This would imply that the imbalance price for being short or long can be considered to be respectively the upward or downward balancing energy price. This is consistent with the assumption proposed above that the savings obtained by TSOs equal the savings observed by BRPs.

- Calculations were made at the ISP level. When a border connects imbalance areas with two different ISPs, data was aggregated at the level of the largest ISP. For example, if the ISP in area A is 1 hour and in area B is 30 minutes, the energy volumes (balancing energy or imbalances) in imbalance area B are added for the first and second half-hour and similarly, volume-weighted averages were applied area B for the imbalance prices.
- Imbalance netting and the exchange of balancing energy are subject to the available cross-border capacity in the economic direction after the intraday timeframe. Hourly values of available cross-border capacity after the intraday timeframe were used.
- Imbalance netting is applied in real time by acting on actual surplus or shortage, while the calculations made use of the total system imbalance in an ISP. This alters the results on the potential for imbalance netting (which is underestimated) and the potential for the exchange of balancing energy, because the imbalances within the ISP are not taken into account.

The above methodology described above made use of the following data items: (i) Amount of activated balancing energy (MWh) per ISP, all types of reserves; (ii) System net imbalance volumes (MWh); (iii) Imbalance prices per ISP (euros/MWh); and (iv) Available cross-border capacity after intraday, hourly values (MW).

Annex 12: Estimated loss of social welfare due to loop flows and unscheduled transit flows in the CEE, CSE and CWE regions and the flows statistics 2011–2013

Table A 8: Estimated loss of social welfare due to loop flows and unscheduled transit flows – (million euros, MW, GWh)

Welfare loss (million euros)	year	direction	CH>AT	CH>DE	CH>FR	CH>IT	AT>SI	FR>BE	FR>DE	FR>IT	IT>AT	IT>SI	BE>NL	DE>NL	DE>PL	DE>CZ	DE>AT	AT>CZ	AT>HU	PL>CZ	PL>SK	CZ>SK	SK>HU	Total	Grand Total	% of LF(UTF) in UFs ¹
	2011	indicated	0,003	0,001	1,167	22,349	-1,068	-2,714	30,271	-36,315	-0,024	0,000	-6,773	3,000	12,497	-1,387	0,000	0,075	1,571	24,112	5,198	0,344	11,351	63,660		
		opposite	3,175	30,133	0,000	-0,031	1,607	0,036	0,000	0,266	8,287	3,466	1,496	0,017	-1,009	2,664	0,000	3,390	0,307	-0,126	-0,142	0,000	-0,964	52,573	116,233	36,2%
LFs	2012	indicated	-0,025	0,294	6,362	24,994	1,013	-0,269	4,082	-14,850	-0,003	0,000	-0,822	25,576	18,219	-3,504	0,000	0,005	0,734	21,432	2,626	2,485	24,914	113,253		
		opposite	25,619	5,976	0,010	0,079	1,185	-1,517	-0,052	3,980	4,376	17,929	1,705	0,004	-0,001	2,283	0,000	1,956	0,545	-0,052	0,014	0,000	-0,438	63,600	176,863	39,0%
	2013	indicated	-0,056	0,617	2,170	6,703	1,264	-3,979	11,947	-11,177	-0,027	0,012	-6,948	58,870	17,674	-1,868	0,000	0,025	0,118	21,305	4,186	1,892	10,894	113,632		
		opposite	14,287	11,036	0,052	0,063	1,677	0,538	0,000	0,322	4,875	8,807	4,887	0,000	-0,726	3,192	0,000	3,157	1,114	-1,418	0,049	0,000	0,008	51,923	165,555	35,6%
	2011	indicated	0,025	0,002	8,524	1,834	1,959	3,024	7,438	54,978	0,088	0,000	14,009	0,350	2,720	5,927	0,000	0,168	0,039	-0,048	5,847	-0,181	1,878	108,581		
		opposite	21,418	57,499	0,000	0,069	-0,031	-0,016	0,000	0,308	-6,099	10,499	-0,737	0,063	1,316	-1,169	0,000	9,889	0,662	0,164	0,361	0,000	2,069	96,255	204,835	63,8%
UTFs	2012	indicated	0,112	-0,115	12,519	43,798	-0,077	0,420	1,307	29,745	0,017	0,000	1,282	23,983	8,856	9,797	0,000	0,003	-0,387	5,221	6,025	-1,007	3,235	145,735		
		opposite	28,471	88,933	0,068	0,082	0,724	4,950	0,061	-0,374	-2,002	-3,323	0,081	0,037	0,003	-1,182	0,000	11,845	1,259	0,077	0,002	0,000	0,763	130,476	276,211	61,0%
	2013	indicated	0,129	-0,172	14,695	24,155	0,068	5,515	3,859	22,526	0,070	0,050	11,270	46,451	8,134	10,786	0,000	0,061	0,984	2,830	3,018	-0,170	4,559	157,808		
		opposite	28,213	69,707	0,136	0,065	0,597	-0,239	0,000	1,218	-1,659	25,631	-0,430	0,000	0,962	-1,688	0,000	14,889	0,956	2,481	1,543	0,000	0,002	142,004	299,813	64,4%
	2011	indicated	0,028	0,003	9,691	24,182	0,891	0,310	37,708	18,864	0,064	0,000	7,237	3,350	15,217	4,540	0,000	0,243	1,610	24,063	11,046	0,163	13,229	172,240		
		opposite	24,594	87,632	0,000	0,038	1,575	0,020	0,000	0,574	2,188	13,964	0,759	0,070	0,307	1,495	0,000	13,279	0,968	0,039	0,220	0,000	1,105	148,828	321,068	
Ufs	2012	indicated	0,087	0,179	18,871	68,792	0,936	0,151	5,389	14,895	0,014	0,000	0,461	49,559	28,075	6,292	0,000	0,008	0,347	26,654	8,652	1,478	28,150	258,988		
		opposite	54,090	94,909	0,077	0,162	1,908	3,433	0,009	3,807	2,374	14,606	1,786	0,041	0,001	1,101	0,000	13,801	1,804	0,025	0,016	0,000	0,325	194,076	453,064	
	2013	indicated	0,073	0,445	16,865	30,857	1,322	1,537	15,807	11,349	0,043	0,061	4,322	104,321	25,797	8,928	0,000	0,086	1,102	24,134	7,204	1,722	15,453	271,428		
		opposite	42,500	80,742	0,188	0,128	2,274	0,299	0,000	1,540	3,216	34,438	4,458	0,000	0,236	1,503	0,000	18,006	1,713	1,063	1,592	0,000	0,011	193,908	465,336	
Flows (MW)	year		CH>AT	CH>DE	CH>FR	CH>IT	AT>SI	FR>BE	FR>DE	FR>IT	IT>AT	IT>SI	BE>NL	DE>NL	DE>PL	DE>CZ	DE>AT	AT>CZ	AT>HU	PL>CZ	PL>SK	CZ>SK	SK>HU			
	2011		-107	-454	250	312	-237	-454	1,155	-444	-89	-30	-448	449	731	-266	-296	-184	-3	633	93	186	229			
Average LFs	2012		-132	-610	629	102	-349	-511	1,308	-204	-306	250	-503	426	562	-282	-126	-134	-39	516	49	94	116			
	2013		-267	35	140	93	-124	-629	988	-174	-50	-31	-614	595	676	-248	-227	-177	-101	568	100	139	175			
Average UTFs	2011		-320	-1,017	1,453	-115	41	356	882	211	138	-54	351	-351	90	475	-350	-525	-39	-16	110	-68	-193			
	2012		-322	-1,039	1,133	224	-113	-115	1,320	-69	77	74	-121	117	317	611	-746	-695	-175	94	223	8	-21			
	2013		-293	-921	1,089	133	-47	-119	1,358	-170	108	-148	-124	123	127	775	-577	-727	27	48	97	94	45			
Average SCHs	2011		-160	-83	-2,897	2,679	423	660	269	1,836	-170	-454	381	629	-284	-1,068	1,385	-429	149	235	142	732	891			
	2012		-267	-58	-2,005	2,422	752	1,362	-993	1,720	-175	-422	280	1,726	-309	-981	1,994	-326	456	170	136	926	958			
	2013		-243	-22	-1,906	2,313	331	1,476	-1,119	1,753	-227	-412	351	2,045	-241	-1,322	1,789	-286	116	149	152	584	726			

Flows (GWh)	year	direction	CH>AT	CH>DE	CH>FR	CH>IT	AT>SI	FR>BE	FR>DE	FR>IT	IT>SI	BE>NL	DE>NL	DE>PL	DE>CZ	DE>AT	AT>CZ	AT>HU	PL>CZ	PL>SK	CZ>SK	SK>HU	Total	Grand Total	% of LF (UTF) in UF*		
2011	indicated		223	166	2,468	2,978	68	80	10,116	89	185	876	78	4,009	6,404	169	492	172	427	5,548	1,013	1,733	2,058	39,353			
		opposite	1,165	4,146	275	245	2,144	4,061	0	3,992	964	1,141	4,005	79	0	2,500	3,083	1,786	452	0	199	102	51	30,378	69,730	45,1%	
2012	indicated		94	1,355	1,814	2,160	319	42	9,570	216	252	665	37	5,688	5,802	106	1,086	237	321	5,467	805	1,838	2,086	39,939			
		opposite	2,881	1,304	421	728	1,438	5,854	0	2,829	517	1,340	5,756	44	1	2,595	2,280	1,529	689	0	468	162	88	30,712	70,651	44,6%	
2013	indicated		87	1,524	1,731	1,651	352	26	8,492	486	118	1,142	21	5,245	5,924	466	757	393	112	4,983	1,019	1,436	1,645	37,609			
		opposite	2,426	1,222	502	836	1,440	5,535	9	2,013	557	1,416	5,398	30	6	2,636	2,744	1,941	998	6	141	215	110	30,181	67,790	41,7%	
2011	indicated		90	36	12,729	1,188	1,141	3,445	7,832	2,907	1,283	966	319	3,398	319	1,741	4,264	1,839	93	868	707	1,254	689	321	47,128		
		opposite	2,892	8,943	0	2,194	784	326	110	10,566	77	1,455	319	3,398	954	106	4,905	4,688	1,210	848	290	1,288	2,015	37,857	84,985	54,9%	
2012	indicated		117	30	10,142	2,630	313	1,333	11,673	1,434	791	1,398	1,297	2,337	2,933	5,401	474	6	274	1,148	1,975	893	627	47,227			
		opposite	2,948	9,159	193	667	1,305	2,343	79	2,036	115	747	2,356	1,310	147	37	7,022	6,106	1,814	326	21	821	813	40,365	87,591	55,4%	
2013	indicated		177	67	9,708	2,189	1,086	1,831	11,990	1,232	1,007	720	1,814	2,894	2,164	6,818	1,830	94	944	1,175	1,233	1,349	999	51,320			
		opposite	2,739	8,135	171	1,020	1,497	2,875	97	2,719	63	2,020	2,898	1,813	1,053	26	6,881	6,466	706	756	388	523	607	43,454	94,774	58,3%	
2011	indicated		331	3,600	2	23,465	4,082	6,636	7,356	16,080	0	4	5,475	8,006	106	78	13,325	54	2,414	2,145	1,271	6,555	7,813	108,797			
		opposite	1,735	4,329	25,373	2	378	854	5,004	2	1,490	3,982	2,135	2,404	2,593	9,430	1,195	3,814	1,113	86	23	144	13	66,188	174,985		
2012	indicated		313	3,647	310	21,276	6,641	13,079	2,378	15,150	1	10	5,036	15,730	12	139	17,656	122	4,168	1,511	1,200	8,145	8,419	124,943			
		opposite	2,658	4,154	17,919	5	32	1,118	11,102	40	1,534	3,719	2,577	572	2,722	8,796	141	2,988	165	17	5	13	2	60,237	185,180		
2013	indicated		698	4,451	187	20,302	3,571	13,842	2,737	15,384	4	23	5,885	18,010	128	54	17,345	86	1,875	1,365	1,412	5,317	6,404	119,080			
		opposite	2,824	4,646	16,883	39	675	917	12,540	28	1,996	3,634	2,806	94	2,242	11,632	1,671	2,591	862	57	84	199	41	66,460	185,540		

Source: ENTSO-E, Vulcanus, EMOS (2014) and ACER calculations

Notes: Data for 2013 are not available because PTDFs are not available. The German-Czech border uses aggregated value for both of its interconnectors, which partially offset one another in volumes of UFs; thus the presented result cannot be meaningfully interpreted.

Annex 13: List of Abbreviations

Acronym	Definition
AC	Alternating current
ACER	Agency for the Cooperation of Energy Regulators
ADR	Alternative dispute resolution
ATC	Available transmission capacity
BEUC	Bureau Européen des Unions de Consommateurs
CACM	Capacity allocation and congestion management (electricity)
CAGR	Compound annual growth rate
CAM	Capacity allocation management (gas)
CBA	Cost-benefit analysis
CBCA	Cross-border cost allocation
CEE	Central-East Europe (electricity region)
CEER	Council of European Energy Regulators
CEGH	Central European Gas Hub (Austrian gas hub)
CGM	Common grid model
CHP	Combined heat and power
CMP	Congestion management procedures (gas)
CRM	Capacity remuneration mechanism
CSE	Central-South Europe (electricity region)
CWE	Central-West Europe (electricity region)
DA	Day-ahead
DC	Direct current
DSF	Demand-Side Flexibility
DSO	Distribution system operator
DSR	Demand-side response
E/E	Entry/exit
EC	European Commission
EEX	European Energy Exchange
EMIB	Energy Market Issues for Biomethane Projects
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
ERGEG	European Regulators' Group for Electricity and Gas
ERI	Electricity Regional Initiative
ETS	Emission Trading System
EU	European Union
FAPDs	Flows against price differentials
FCFS	First come, first served
FG	Framework guidelines

Acronym	Definition
FUI	France-UK-Ireland (electricity region)
GDP	Gross domestic product
GTM	Gas Target Model
HH	Henry Hub (US)
HVDC	High-voltage direct current
IEA	International Energy Agency
IEM	Internal Energy Market
IP	Interconnection point
LDZ	Local distribution zone
LNG	Liquefied natural gas
LTCs	Long-term contracts
mcm	Million cubic metres
MMR	Market Monitoring Report
MS	Member State
NBP	National Balancing Point (the British gas hub)
NC	Network code
NCG	Net Connect Germany (one of Germany's gas hubs)
NRA	National regulatory authority
NTC	Net transfer capacity
OTC	Over-the-counter
P2P	Point-to-point
PCI	Project of common interest
PCR	Price Coupling Region
PEG	Point d'Echange de Gaz (the name of France's gas hubs; Nord, Sud and TIGF)
POTP	Post-tax total price
PRISMA	Platform for European gas capacity booking
PSV	Punto di Scambio Virtuale (the Italian gas hub)
PTDF	Power transfer distribution factor
PTP	Pre-tax total price
REMIT	Regulation on wholesale energy market integrity and transparency
RES	Renewable energy sources
RES-E	Electricity from renewable energy sources
RPI	Retail price index
SEE	South-East Europe (electricity region)
Sm ³	Standard cubic metres
SME	Small and medium-sized enterprise

Acronym	Definition
SO	System operator
SOB	Shared order book
SoLR	Supplier of last resort
ST	Short-term
SWE	South-West Europe (electricity region)
TEN-E	Trans-European Energy Networks
TEN-T	Trans-European Transport Networks
TPA	Third-party access
TSO	Transmission system operator
TTF	Title Transfer Facility (the Dutch gas hub)
UIOLI	Use It or Lose It
UNC	Uniform network code
VAT	Value added tax
VTP	Virtual trading point
ZEE	Zeebrugge-Beach (the Belgian physical interconnection point)
ZTP	Zeebrugge Trading Point (the new Belgian gas hub)

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