

THE JANUARY 2009 GAS CRISIS: WHAT HAPPENED IN CENTRAL AND SOUTH EAST EUROPE?

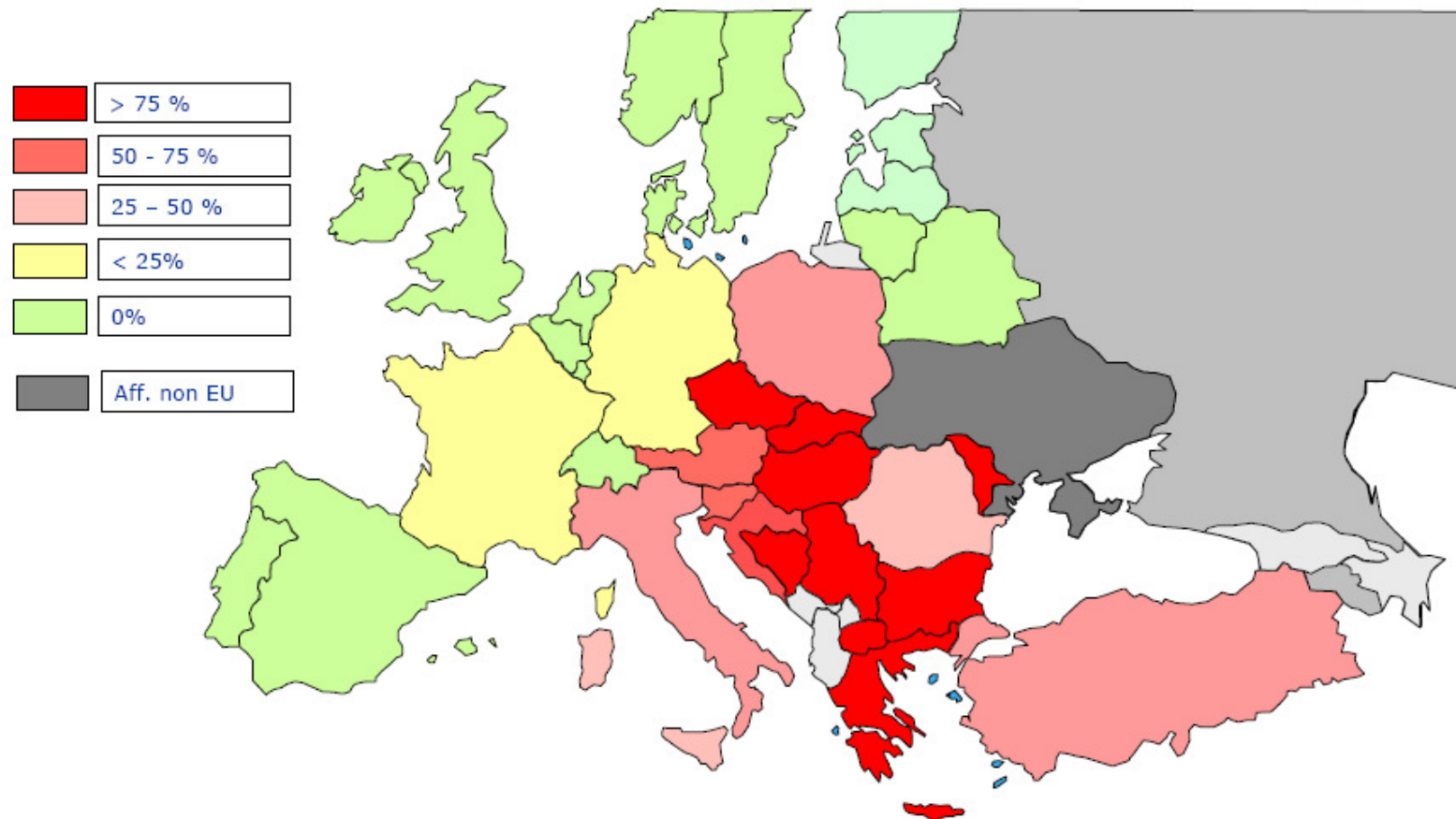
Péter Kaderják

Regional Center for Energy Policy Research
Corvinus University of Budapest

April 16 2009, Budapest

JANUARY CRISIS - ASYMMETRIC IMPACT

Reduction in gas supply in %



Source: DG TREN

GAS INDUSTRY BACKGROUND INFO

	Share of natural gas in primary energy use (%)	Domestic production Bcm/year, 2007	Import Bcm/year, 2007 Per source			Mobile storage capacity Bcm/year	Annual gas consumption Bcm/year, 2007			
			Russian	Other	Total		Households	Electricity and heat	Industry	Total
Austria	21	1,8	6	3,7	9,8	4,2	1,5	2,7	3,7 (with commercial)	7,9
Bulgaria	14	0,4	3	0	3	0,6	0,8	0,44	1,11	3,4
Bosnia and Herzegovina	6	0	0,32 (total capacity contracted 0,75)	0	0,32	0	0,1	0	0,2	0,32
Czech Republic	16	0,09	6,75	2,25	9	2,90	3,8	0,45	3	9
Croatia	26	2,89	1,05 (export 0,75)	0	1,05 (export 0,75)	0,62 (10% is rented by Slo)	1,08	0,4	0,72	3,3
Hungary	43	2,5	7,9 (East)	2,6 (West)	10,5	3,8	4	4,3	1,5	13
Romania	36	11,3	5,7	0	5,7	2,8?	4,7	3	4,3	17
Serbia	13	0,25	2,14	0	2,14	0	0,65	?	1,3	2,39
Slovakia	31	0	9	0	9	2,8	4	0,4	1,8	9
Slovenia	14	0	0,66	0,54	1,12	0,11 (rented)	0,17	0,11	0,68	1,2

	Seriousness	Impact
Austria	orange	green
Bulgaria	red	red
BiH	red	red
Czech R	orange	green
Croatia	green	orange
Hungary	orange	orange
Romania	green	green
Serbia	orange	red
Slovakia	red	orange
Slovenia	orange	green

Seriousness: share of
Russian imports in supply

Impact: level of emergency /
restrictions that were needed

green: low
orange: mid
red: high

LOW IMPACT COUNTRIES – KEY FOR (SHORT TERM) SUCCESS

- Demand: economic crisis, mild December '08
- Supply:
 - Import diversification (AT, CZ, SLO) – contractual, infra
 - Successful system reconfiguration (reverse flows) – AT, CZ
 - Closer market integration with Germany (AT, SLO, CZ)
 - Efficient market performance (AT balancing market)
 - High degree of local production / storage (RO, CZ, AT)

AUSTRIA – measures (E-Control)

	Import restriction in % Baumgarten/Oberkappel	Peak daily cons. in m. m3/h	Additional actions taken under market conditions
6/1, 16.00h	33/100		Crisis management activated
7/1, 00.00h	0/100	1.77	Additional balancing energy mobilized, additional storage capacity from Haidach activated for Austrian supply
8/1, 08.00h	0/100	1.80	Additional balancing energy mobilized, increase of import from DE
9/1, 08.00h	0/100	1.91	Additional balancing energy mobilized, increase of transit flows W-E
10/1, 8.00h	0/100	1.70	Increase of import and transit from DE Voluntary fuel switch of gas-fired power plants Voluntary optimization by large industrial customers
11/1, 8.00h	0/100	1.70	
12/1, 8.00h	0/100	1.95	
13/1, 8.00h	0/100	1.91	Additional balancing energy mobilized
14/1, 8.00h	0/100	1.93	Additional balancing energy mobilized
15/1, 8.00h	0/100	2.01	Increase of import and transit from DE Voluntary fuel switch of gas-fired power plants Voluntary optimization by large industrial customers
16/1, 8.00h	0/100	1.85	
17/1, 8.00h	0/100	1.57	
18/1, 8.00h	0/100	1.50	
19/1, 8.00h	0/100	1.60	
20/1, 20.00	100/100	1.60	

- Reduction of demand
 - No customer restriction was needed
- Increase of supply
 - Max withdrawal from storage
 - Additional imports from Norway and Germany
- Helped Slovakia

- Reduction of demand
 - Public announcement called people to save gas
 - No obligatory measures were needed
- Increase of supply
 - Additional imports from Austria and Germany (also tried to increase shipments from North Africa)

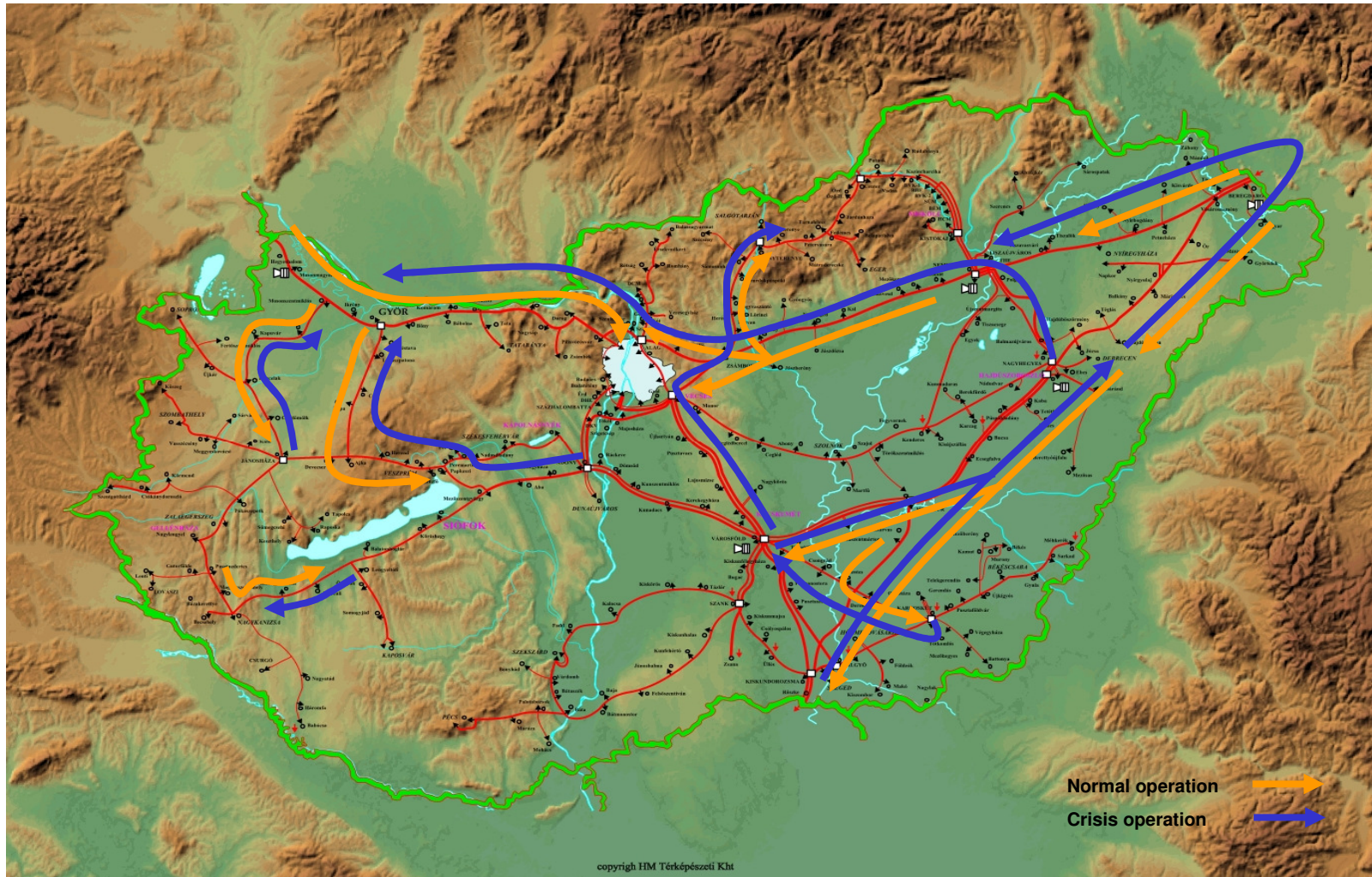
- Economic crisis helped
- Local production and sufficient storage helped

- Local production (CR, HU) and massive storage (HU, SK) partly compensated for low level of contractual diversification
- Less developed market is substituted with intra-company transactions
- System reconfigurations successful
- Mixed success with consumer curtailments
- Fuel switch, electricity for heating

- Reduction of demand
 - State of emergency declared on 6th January 2009
 - Government order to limit natural gas distribution for the companies with the offtake above 60 000 cm/y; or penalization
 - Effect is questionable, mixed with the impact of the economic crisis
 - No info on interruptible consumption or fuel switch
- Increase of supply
 - Max withdrawal from storage – covers 90% of consumption
 - Additional supply from other countries: 4,5 mcm/d swap with CZ for their gas in Slovak storage from January 10; 5 mcm/d from CZ from January 18, possible to use reverse flow; increased to 6,5 mcm/d from January 18

- Reduction of demand
 - Category I and II restrictions
 - Fuel switch in electricity generation, interruptible customers, restriction.
 - Demand development and economic crisis impact
 - Public announcement called people to save gas
- Increase of supply
 - Maximum withdrawal from commercial storage
 - Utilisation of strategic storage (will add 20 mcm/d withdrawal capacity to the system).
 - Contractual diversification proved to work (GdF, EON Ruhrgas)

HUNGARY – the crisis



Source: FGSZ (Hungarian TSO)

- Reduction of demand
 - Fuel switch
 - January 7: Gvt order for level 4 emergency – technological minimum, heating secured
 - January 9: Level 6 and 7 – cut off other customers than households and heating
 - Substitution with electricity (record: Jan 12)
- Increase of supply
 - Max withdrawal from storage
 - Max production
 - Increased import from January 12: Eon, Mol/GdF, ENI; AT swap with SI gas in CRO storage.

- Key problems:
 - No / limited storage
 - No / limited production
 - Low level of preparedness
 - Low level of oil reserve for heating
 - No import diversification (contractual or physical)
 - Dependence on uni-directional single lines
 - Farther away from the liquid German market

- Reduction of demand
 - Government: restrict demand to 5-6 mm³ / day; supply restricted to protected customers and public institutions
 - Fuel switch for the 5 heating plants – lack of oil reserve, technical problems – completed only by Jan 12
 - Industry to shut down to technical minimum
 - Customers increased electricity use for heating
- Increase of supply
 - Max withdrawal from only storage
 - Increase production?
 - Additional supply of 2 mcm/d is possible from Greece and 0,5 from Turkey (only on Jan 19)
 - Additional supply from Romania was not possible (technical constraints) – instead RO offered electricity and fuel oil

- Reduction of demand
 - Jan 8 – heating ordered to switch to oil – problems
 - Shut of production with minimal damage
 - Shut of all customers
 - 10-15% increase in electricity consumption
 - Oblige transport companies to deliver alternative fuel for district heating
- Increase of supply
 - Max production
 - Additional import arranged: Jan 8 – MOL 2mcm/d, Jan 9 – GdF/E.ON + 2,7 mcm/d
- Lessons
 - No alternative fuel for several customers
 - No alternative supplier
 - Storage non-operational

- Reduction of demand
 - Fuel switch, 20 days storage,
 - Use electricity for heating
- Increase of supply
 - Not possible
 - E.ON shipments of 1,5 mcm/d
- Lessons
 - No alternative fuel for several customers
 - No alternative supplier
 - Low level of oil stocks

SELECTED ISSUES

- Emergency regulations outdated, only partly functional
 - Limited effectiveness of load restrictions (e.g. Croatia, Slovakia, Hungary)
 - Measurement, monitoring, enforcement
- Effectiveness of interruptible contracts?
- Effectiveness of fuel reserve regulations?

A need for a market based approach?

A PUSH FOR A REGIONAL MARKET FOR GAS STORAGE

- Different technical and business preconditions to develop local storage facilities
- Substantial potential at the regional level – regulation sufficient?
- Opens discussion for developing strategic gas storage (e.g. in Hungary)

THE FORTUNE OF THE ECONOMIC CRISIS AND MILD DECEMBER

- Excessive reserves available in OMs' storages and on LNG market
- Economic output fell dramatically in NMs – additional impact on gas demand

- Flow reversals: unprecedented technical accomplishment
- Experiment of EU internal gas market integration (technical and commercial)
- No significant price increase experienced
- Additional shipments to SK, HU, SR, BiH, SLO, CR (from the west) and finally BG (from the south)

THE ROLE OF MULTINATIONALS



Shipment
routes for
Additional
Western
Imports into
the region

Source: E.ON, 2009

THE ROLE OF MULTINATIONALS

Support to the neighbors: due to the Western imports, E.ON could supply gas to some neighbouring countries



Source: Gas Transmission Europe

Supply Security, February 2009, Dr. Matthias Keuchel Page 4

Source: Keuchel, 2009

SUGGESTIONS FOR SHORT TERM AND LOW COST OPTIONS

- Increase alternative fuel reserves for heating
- Revise balancing conditions in the electricity sector
- Increase contractual import-diversification
- Identify and complete minor interconnection developments with significant impact
 - E.g. AT-SK, HU-CR, HU-SK, BG-GR, NETS
- Regulatory tasks:
 - Transmission facilities to become multi-directional
 - Revise protective measures that limit emergency cooperation
 - Improve the effectiveness of customer curtailment regulations (measurement, balancing regime, other market based solutions)
 - Revise and harmonise national emergency regulations

APPENDIX

- Consumption: 9,7 bcm annually
- Transit to Italy, Slovenia and Germany
- 5 storage facilities, max withdrawal 32 (47) mcm/day
- Limited production (7 mcm/ day)
- Normal daily winter consumption: 45 mcm/day
- Emergency: January 7-19
- Daily loss of Russian import: 10 mcm
- Economic loss from curtailment: NO

AUSTRIA – transit system

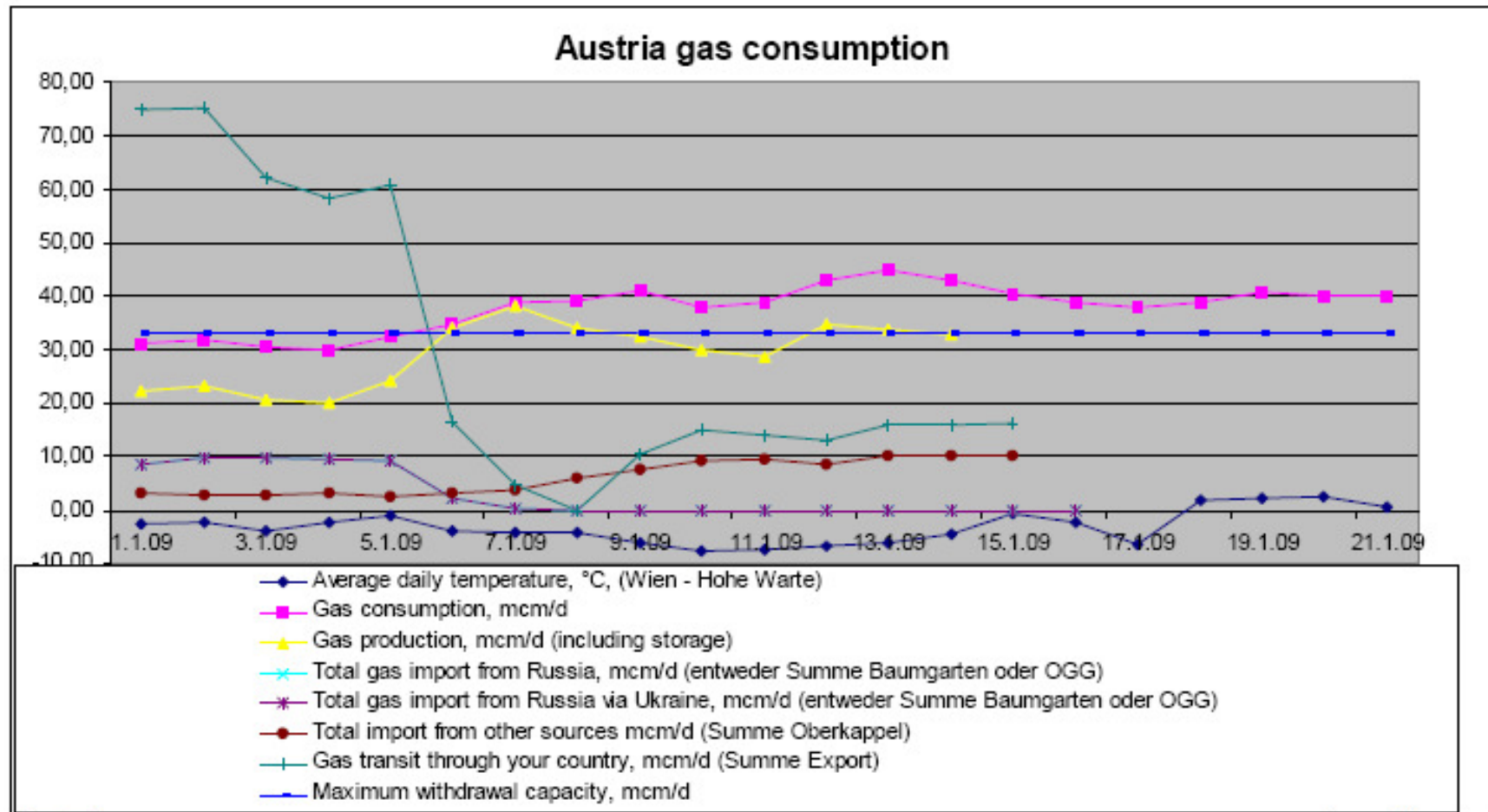


* Inclusive own use, losses, system losses, statistical adjustments

Sources: E-Control, OMV Gas GmbH, TAG GmbH and BOG GmbH

Source: E-Control

AUSTRIA – the crisis

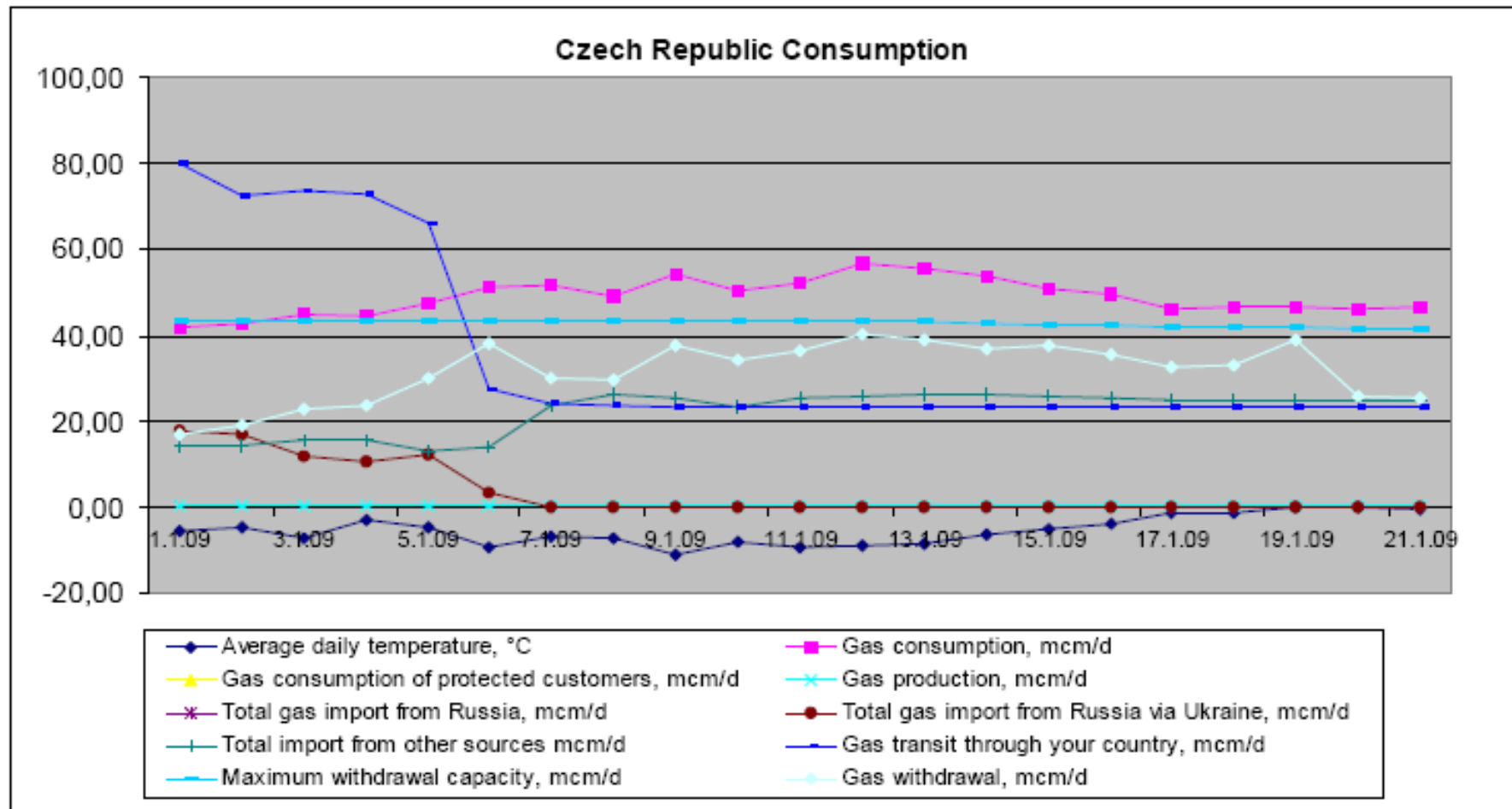


Source: Gas Coordination Group

- Further expanding storage
- Better coordination of TSOs should be in place
- Better regional market integration
- Market solutions, transparency worked properly
- Austria provided essential transit for solidarity shipments

- Consumption: 9 bcm annually
- Transit to Germany
- Storage: 41 (55) mcm/ day
- Limited production
- Normal daily winter consumption: 53 mcm/day
- Daily loss of Russian import: 15 mcm
- Economic loss from curtailment: NO

CZECH – the crisis



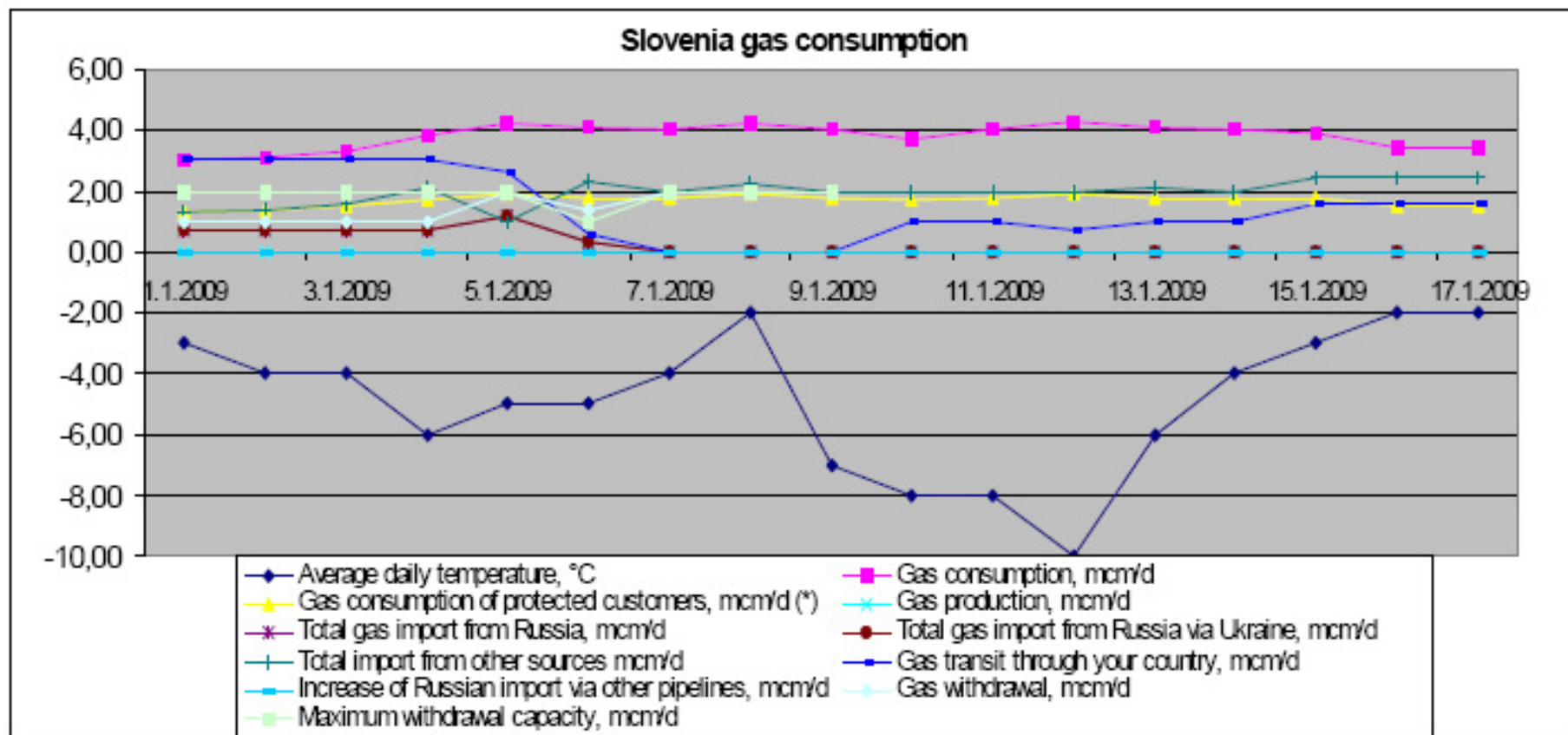
Source: Gas Coordination Group

- Sufficient storage was crucial
- Contract diversification worked
- West-east transactions were technically feasible
- Stronger market integration with Germany helped

- New interconnectors
- Storage capacity expansion (investment plans announced in January)
 - 3 BCm to 4.3 Bcm

- Consumption: 1,12 bcm annually
- Transit from Austria to Croatia
- Storage: NO (rented in Croatia and Austria)
- Production: NO
- Well diversified import: 50% Russia, 35% Algeria, 10% Austria
- Normal daily winter consumption: 4 mcm/day
- Daily loss of Russian import: 1 mcm
- Economic loss from curtailment: NO

SLOVENIA – the crisis

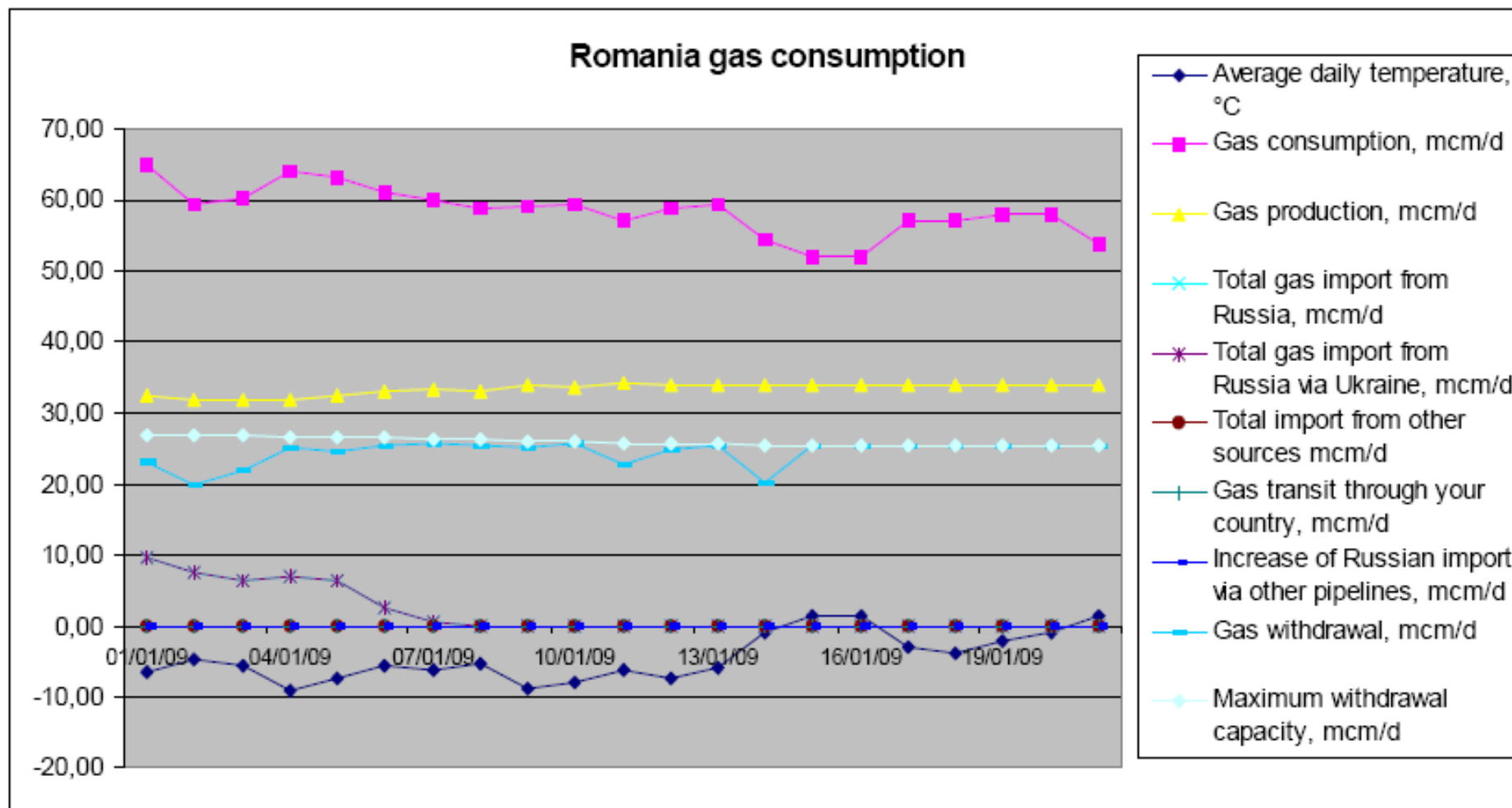


Source: Gas Coordination Group

- Contract diversification worked
- West-east transactions were technically feasible
- Stronger market integration with Austria helped

- Rethinking domestic gas storage
 - Earlier studies (1985, 2000) suggested that building a storage is not feasible, therefore they decided to lease storage capacity from Croatia and Austria.
- Negotiations on South Stream
- Demand:
 - Additional coal-fired and nuclear generation capacity
 - (there was interest before but now even more so)

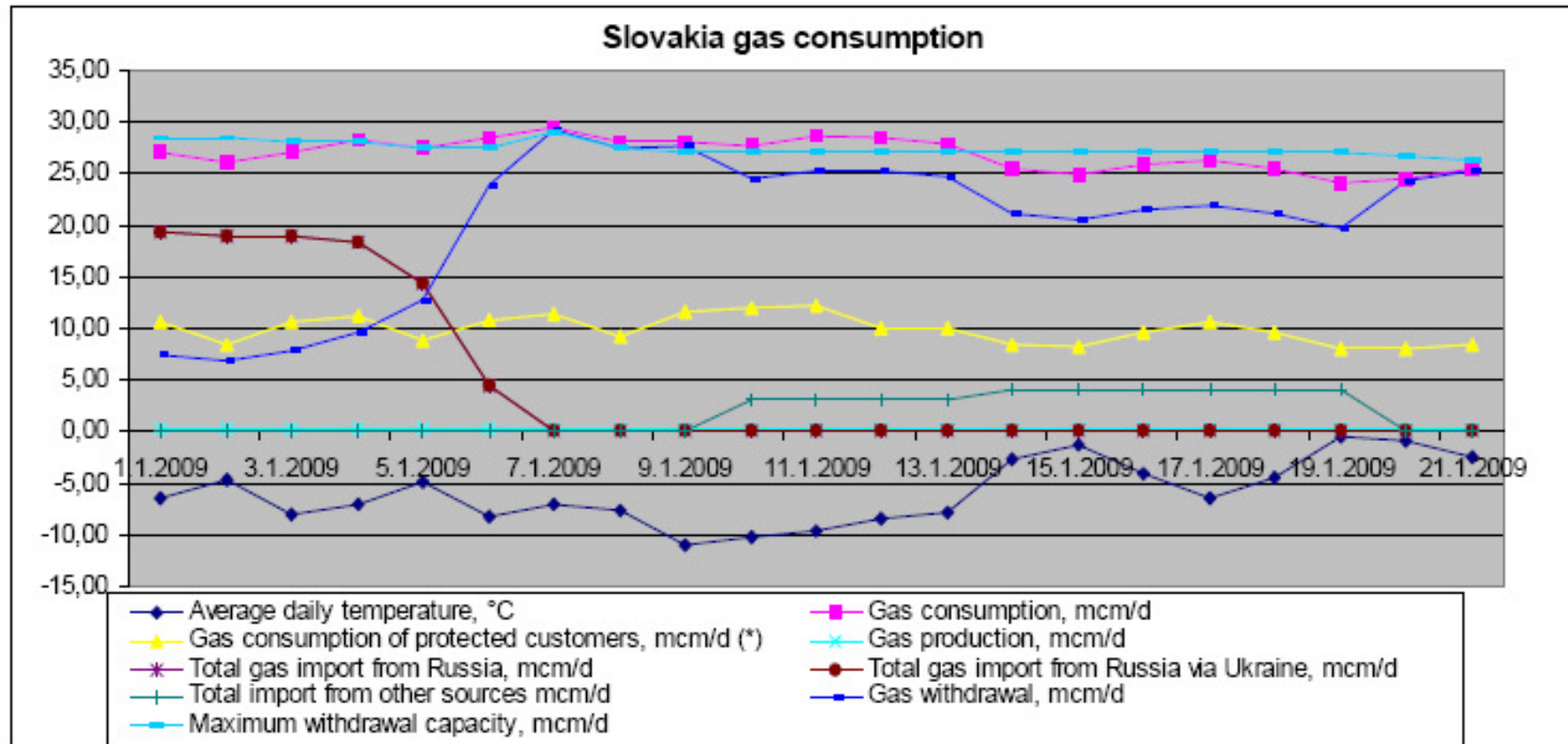
ROMANIA – the crisis



Source: Gas Coordination Group

- Consumption: 5,7 bcm /a (2007)
- Transit from Ukraine to the Czech Republic
- Storage withdrawal: max 32 mcm/d
- Limited production: 0,3 mcm/d
- Normal daily winter consumption: 30 mcm/d (peak: 44 mcm/d)
- Emergency: January 6-21
- Daily loss of Russian import: 20 mcm
- Economic loss from curtailment: industry seriously hit, € 1000 m (?)

SLOVAKIA – the crisis



Source: Gas Coordination Group

- Demand side measures partly effective
- Flow reversal was accomplished – successful cooperation of multinational players (E.ON, GdF, RWE, OMV)
- Crucial role of storage
- Issues discussed / raised due to the crisis
 - nuclear energy
 - infrastructure and resource diversification
 - Building of strategic underground storage facilities for NG
 - Increasing of competition in the gas industry by establishment of new companies, including state-owned ones
 - amendment needs for NG storage regulation
 - amendment needs in respect of the state of emergency regulation
 - Secondary impacts (savings by way of insulations and in heating, changeover to alternative fuels, condition improving for using renewables)

- Following the crisis the government called for new laws to better cope in a gas emergency
 - They blame the gas importer and supply company managed by EON and GDF for accentuating the crisis by exporting 15-20% of the country's gas reserves from its storage sites while industrial consumers were curtailed
- Fico announced that they may set up a new joint venture with foreign partners (incl. Russia) to serve as a competitor to monopoly importer SPP.
 - Fico also considers building/buying strategic storage either in Slovakia or in the Czech Republic

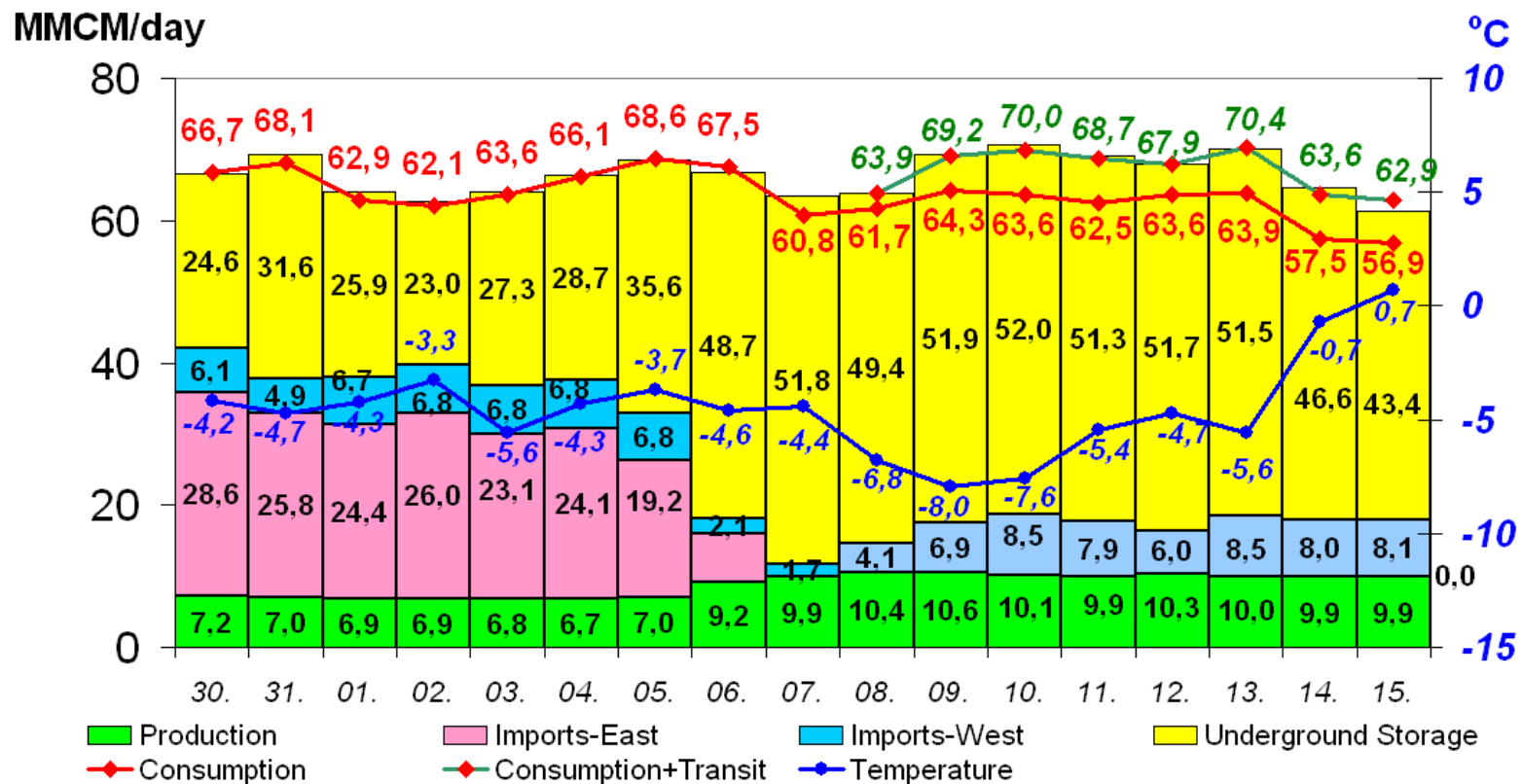
- Consumption: 14 bcm /a (2007)
- Transit from Ukraine to Serbia and BiH
- Storage withdrawal: max 53 mcm/d
- Production: 8-9 mcm/d
- Normal daily winter consumption: 65-70 mcm/d
- Daily loss of Russian import: 30 mcm
- Other import: 0-7 mcm/d
- Economic loss from curtailment: € 70 m

HUNGARY – the crisis

Restriction of consumption

Category I.: 06.01. 20:30 – 15.01. 10:00

Category II.: 07.01. 08:00 – 08.01. 09:30

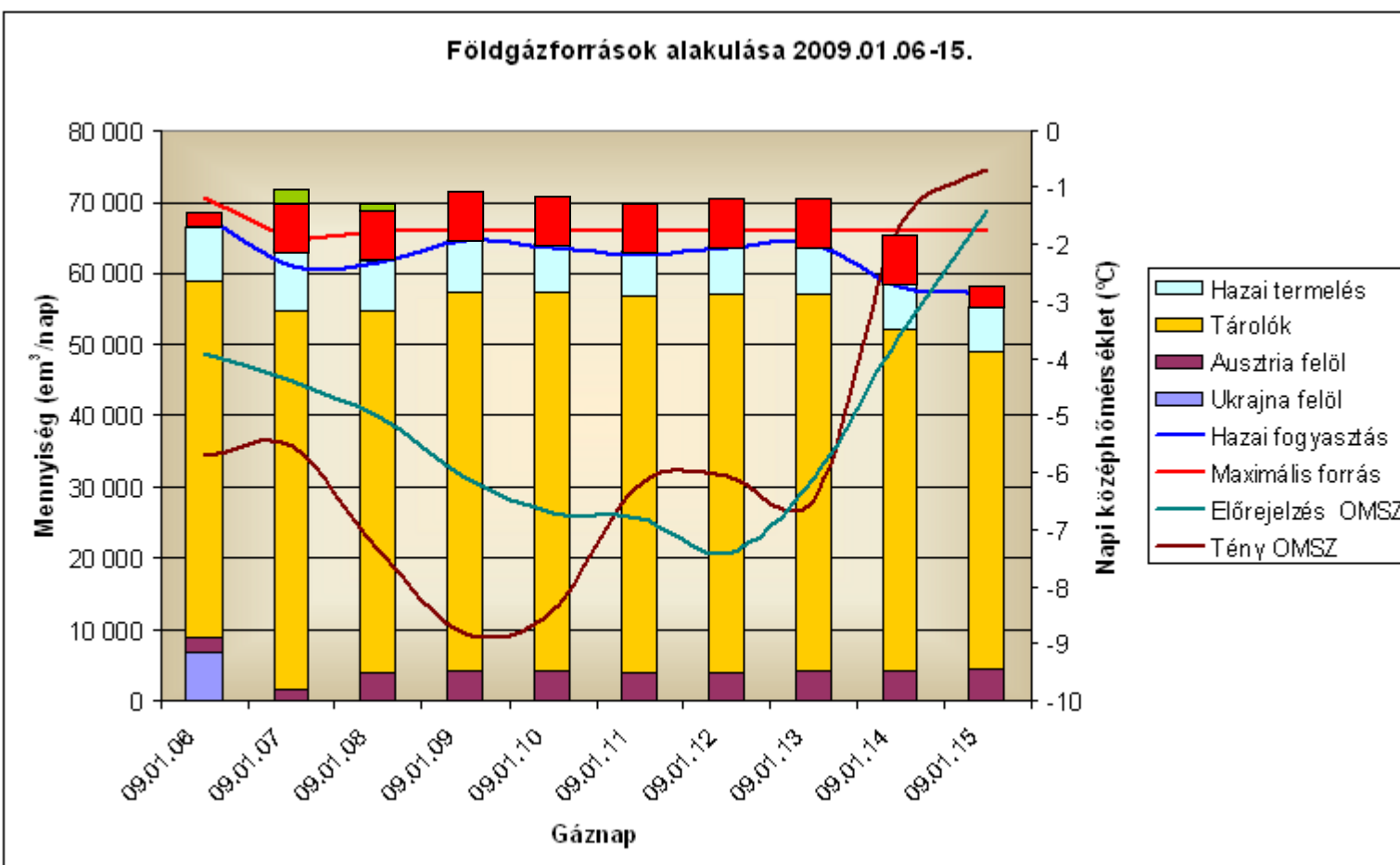


Source: Hungarian Energy Office

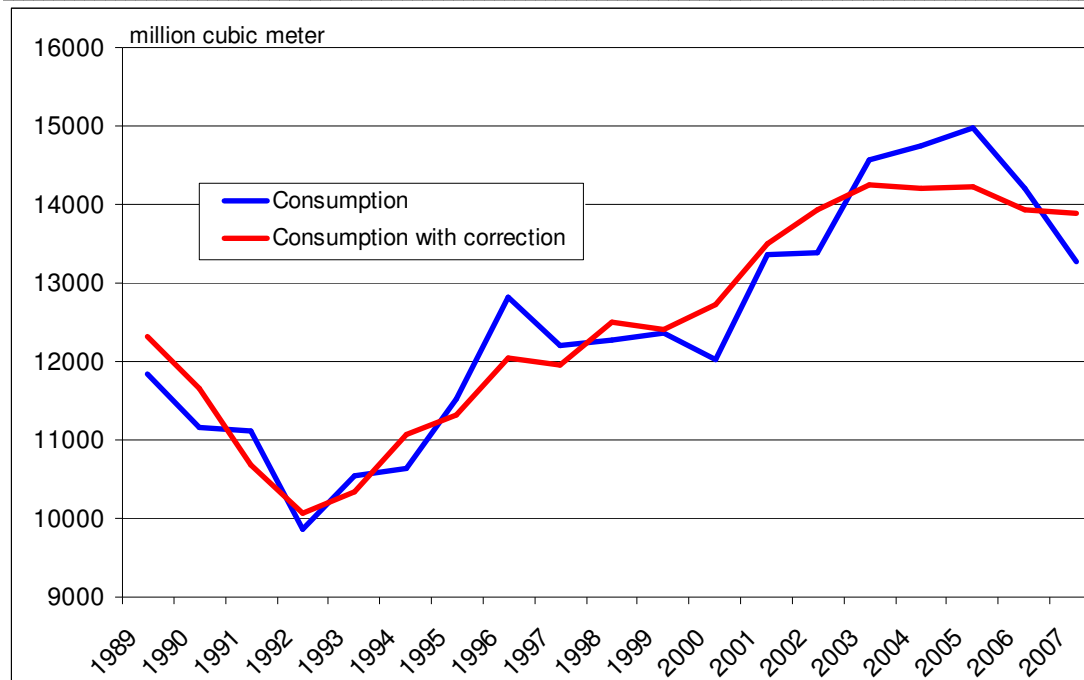
Second phase: 2009.01.06. – 01.15.

Export shipments:

- 2 Mm³/d from domestic sources to Serbia
- 2,7 Mm³/d from Austria to Serbia
- 1,5 Mm³/d from Austria to Bosnia - Herzegovina



HUNGARY – demand development



Total consumption
decreases...

...and ...

Q day/ T	2006	2007	2008	2009
Peak gas consumption	88,9	75,3	78,1	68,3
-3,0 °C	73,0	71,9	69,0	68,0
-5,0 °C	79,9	72,9	74,4	73,0

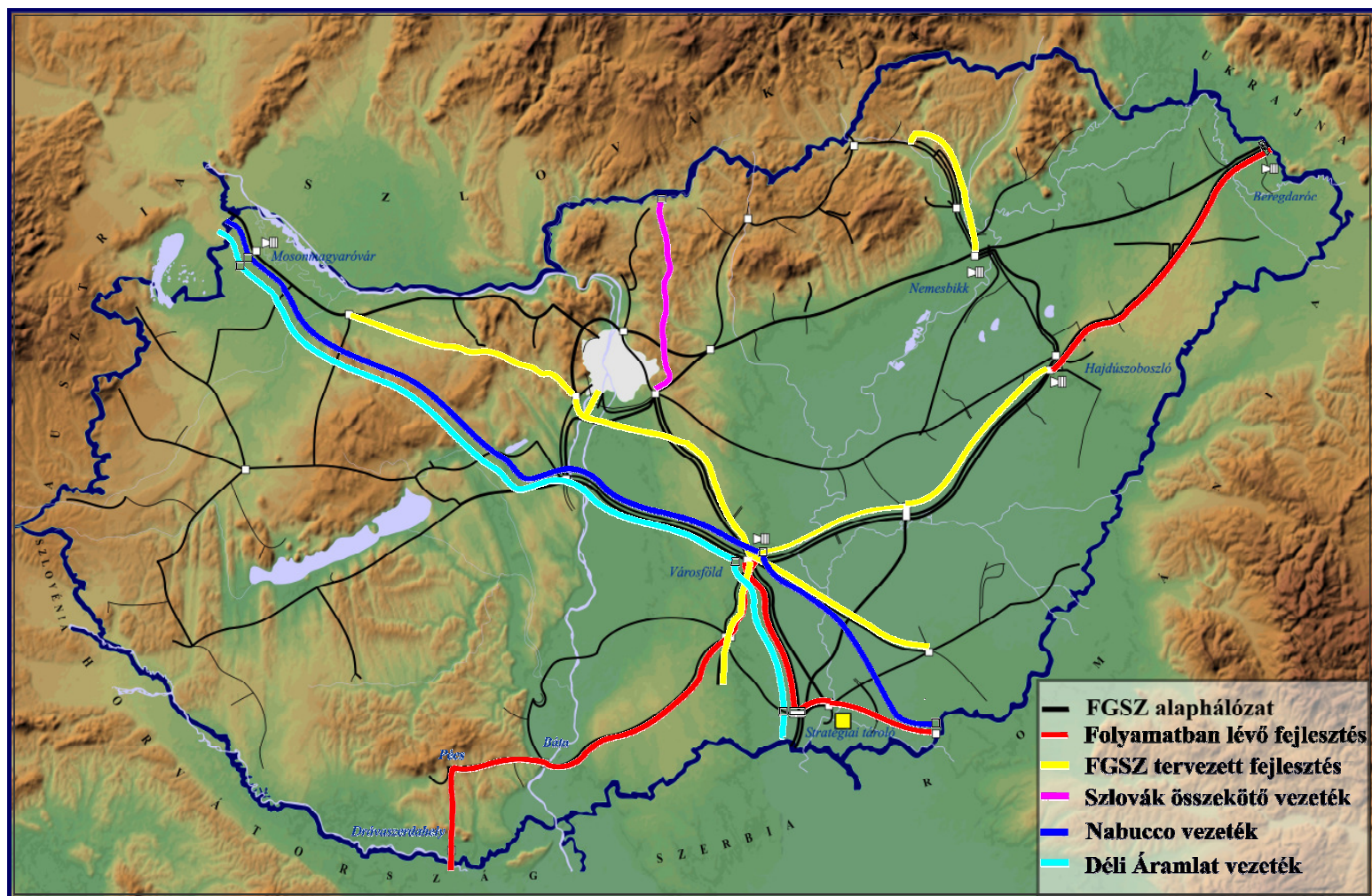
... peak consumption
decreases

- Demand side measures partly effective
- Domestic flow reversal was accomplished – successful cooperation of multinational players (MOL-FGSZ, E.ON, GdF, OMV)
- Crucial role of storage
- Crucial location of the country
- Crucial importance of new infra development

Infrastructure investments



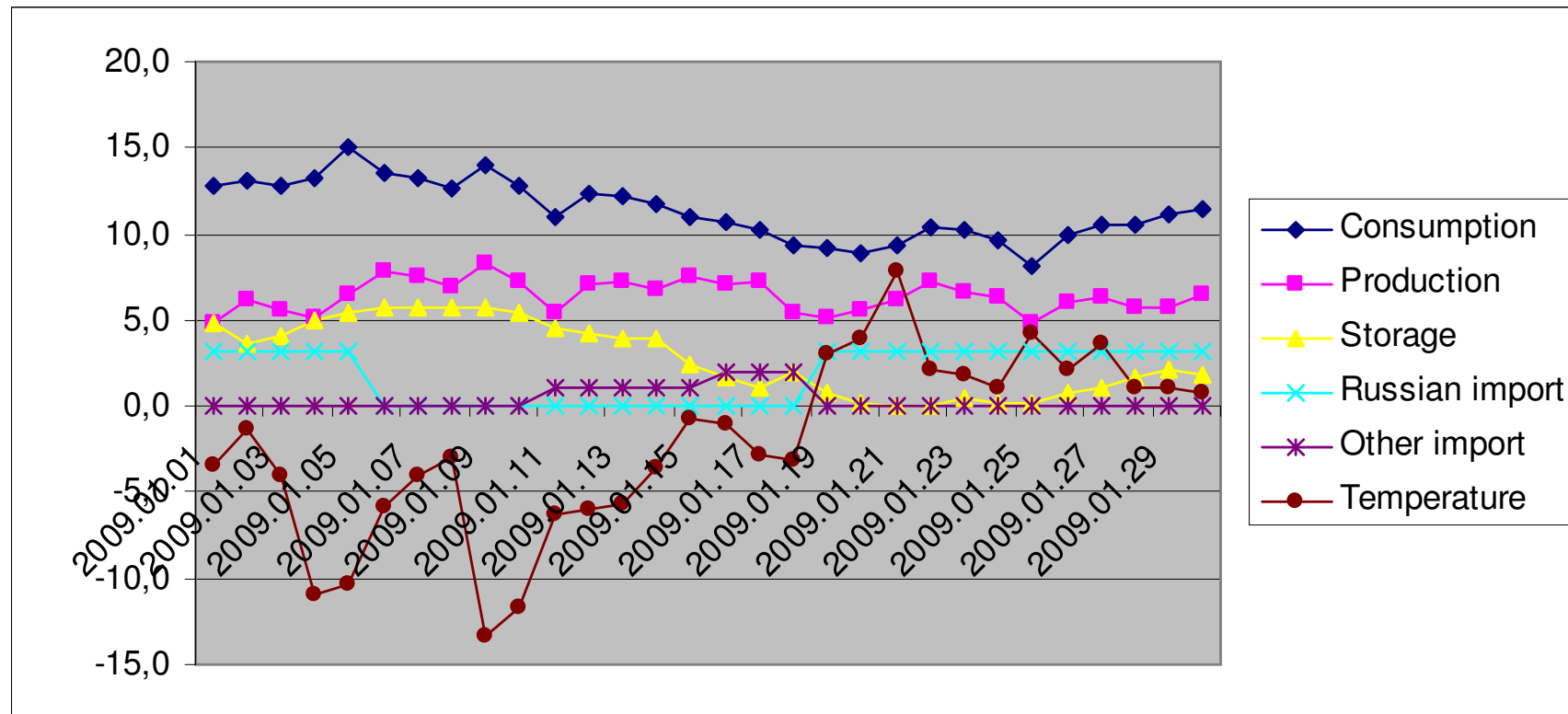
NATURAL GAS TRANSMISSION
MEMBER OF THE MOL GROUP



- Storage
 - Strategic storage
 - Additional commercial storage
- Lessons:
 - Consumer curtailment procedure and the legislation needs to be reconsidered

- Consumption: 3,5 bcm annually
- Only interconnection with Slovenia
- 1 storage: 5,7 mcm/ day
- Production covers 68% of consumption, rest is Russian import
- Normal daily winter consumption: 12 mcm/day
- Daily loss of Russian import: 3,2 mcm
- Economic loss from curtailment: Thousands of companies affected; € 270 m (preliminary estimate)

CROATIA – the crisis



production is estimated

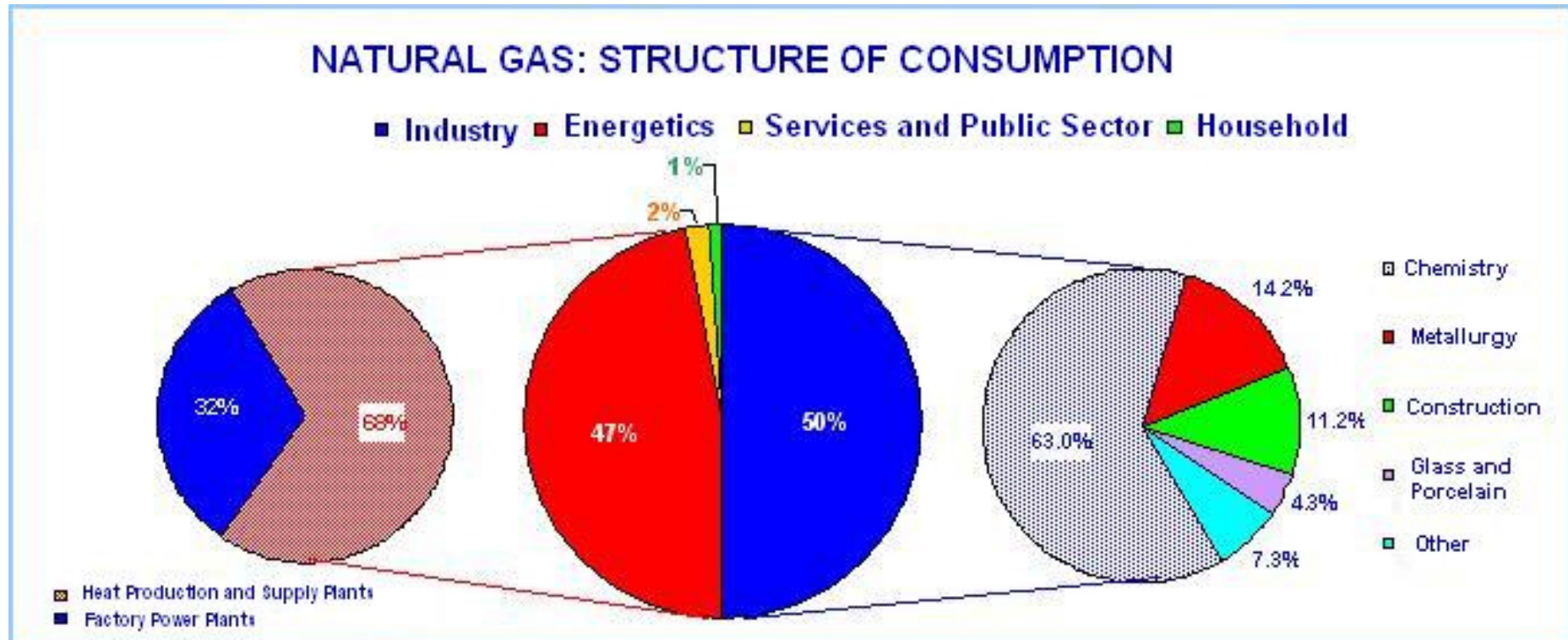
Source: INA

- Too much reliance on domestic production and storage
- Limited interconnectivity
- Problems in compliance with restrictions

- LNG:
 - Ministry has pledged to reduce the construction period for the LNG terminal (10 bcm to 15 bcm) on Krk
 - Construction was scheduled to begin in 2010, expected to enter service in 2014.
 - Plans for second energy terminal on the Bosnian border (Ploce) have been revived (January 21) – Qatar agreed to provide shipments
- Pipeline projects:
 - Pipelines linking the Croatia with Hungary
- More storage
 - Plans to build a second underground storage facility (500 mcm)

- Consumption: 3,4 Bn m³ annually
- Transit to Turkey, Greece
- 1 storage facility (4,5 mm³/ day)
- Limited production (1-2 mm³ / day)
- Normal daily winter consumption: 13 mm³/day
- Emergency: January 6-21
- Daily loss of Russian import + transit: 9 mm³
- Economic loss from curtailment: industry seriously hit, € 255 m

BULGARIA – consumption

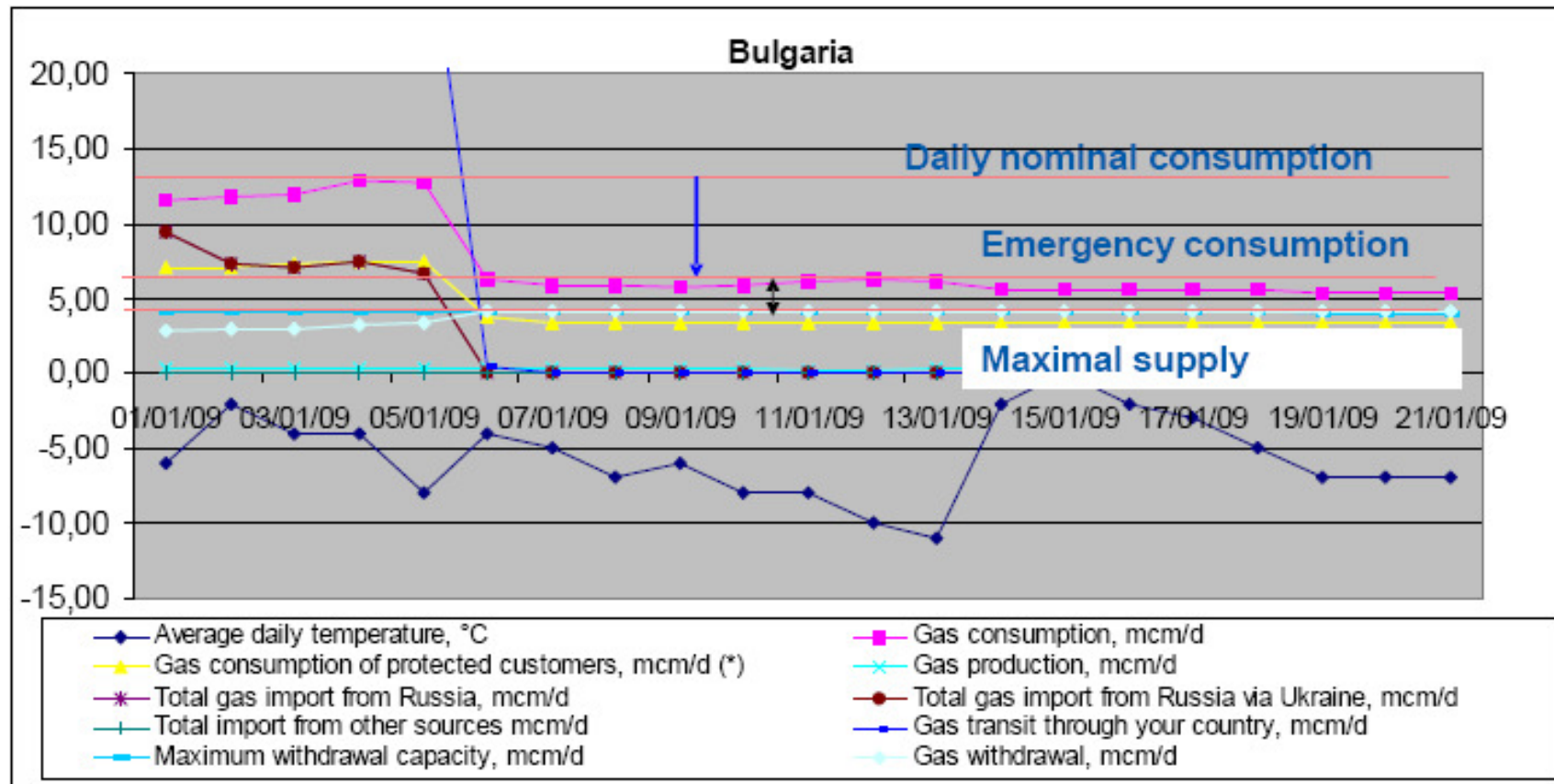


Direct use of households: only 1%

Heat production: 32%, incl. - district heating

Source: Ministry of Economy and Energy

BULGARIA – the crisis



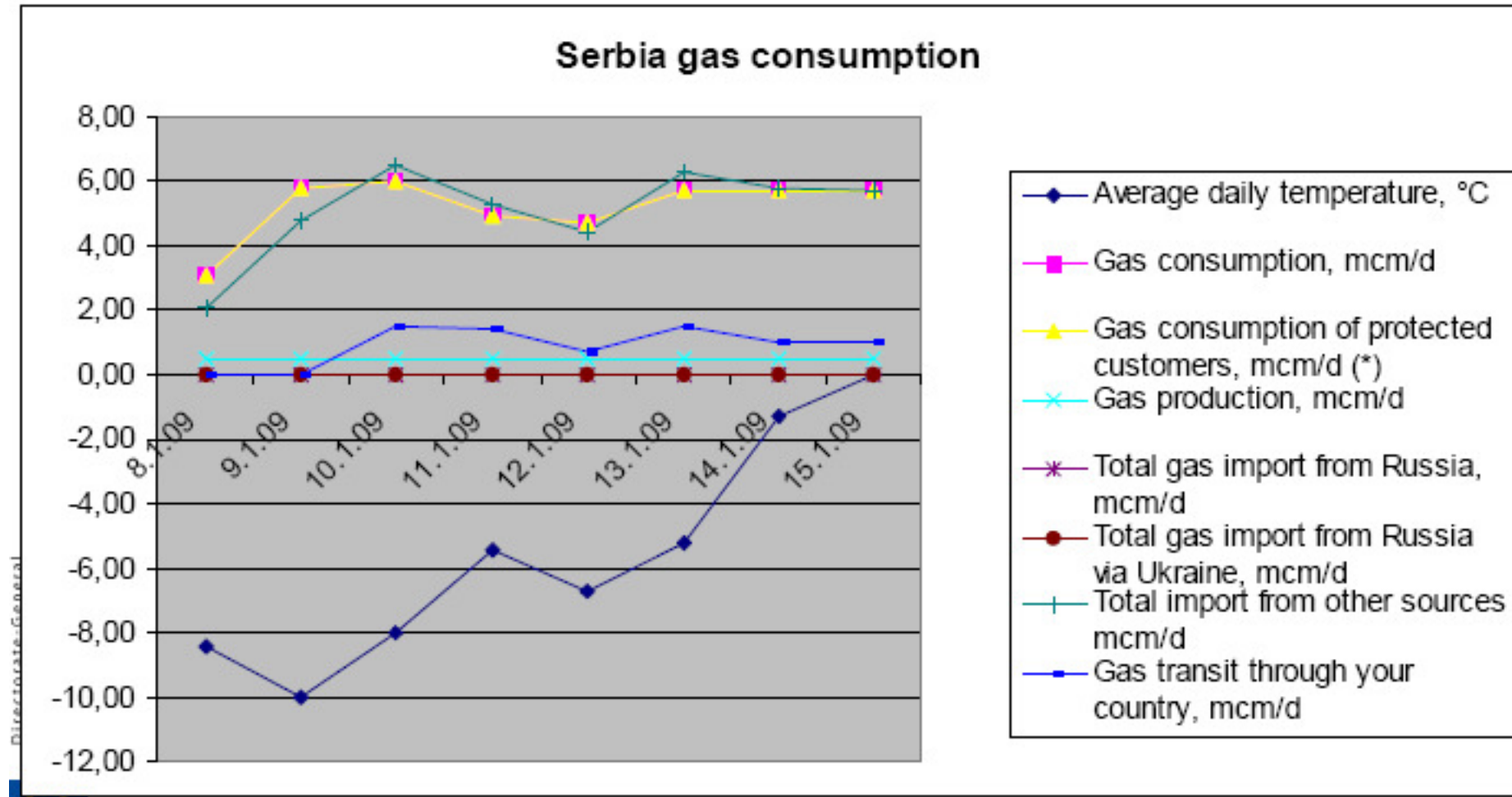
Source: Gas Coordination Group

- Short in emergency supply
 - 1,5 mcm/d is missing
 - Restricted storage withdrawal rate
 - No diversification of routes or supply (but extra import from TR and GR in the last days!)
- Problems in emergency preparedness
 - Fuel switching of heat producers
 - Might be a major role for switch to electricity
 - Industry competitiveness is at serious risk

- New interconnector
 - Negotiations on interconnectors with Romania and reversing flows.
 - Interconnection with Greece (meeting the TGI pipeline)
- LNG plans
 - Looking for sources in Iran and Azerbaijan

- Consumption: 2,5 bcm annually
- Single line from Hungary to BiH
- 1 storage facility, out of operation
- Limited production (8% of needs, 0,5 mcm / day)
- Normal daily winter consumption: 11 mcm/day
- Daily loss of Russian import + transit: 10 mcm
- Economic loss from curtailment: industry seriously hit, € 30-60 m estimated + € 24 m gvt spending on additional oil

SERBIA – the crisis

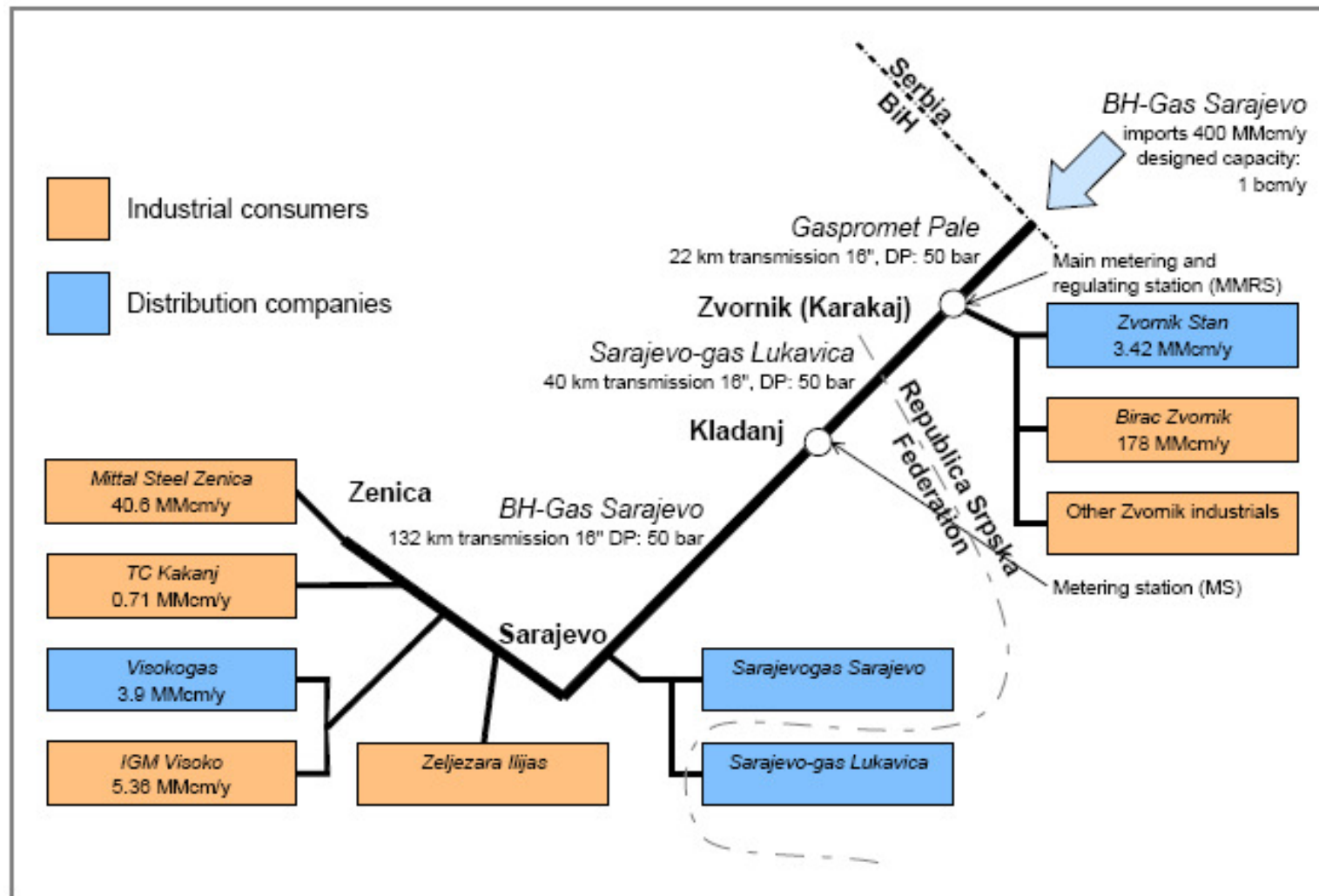


Source: Gas Coordination Group

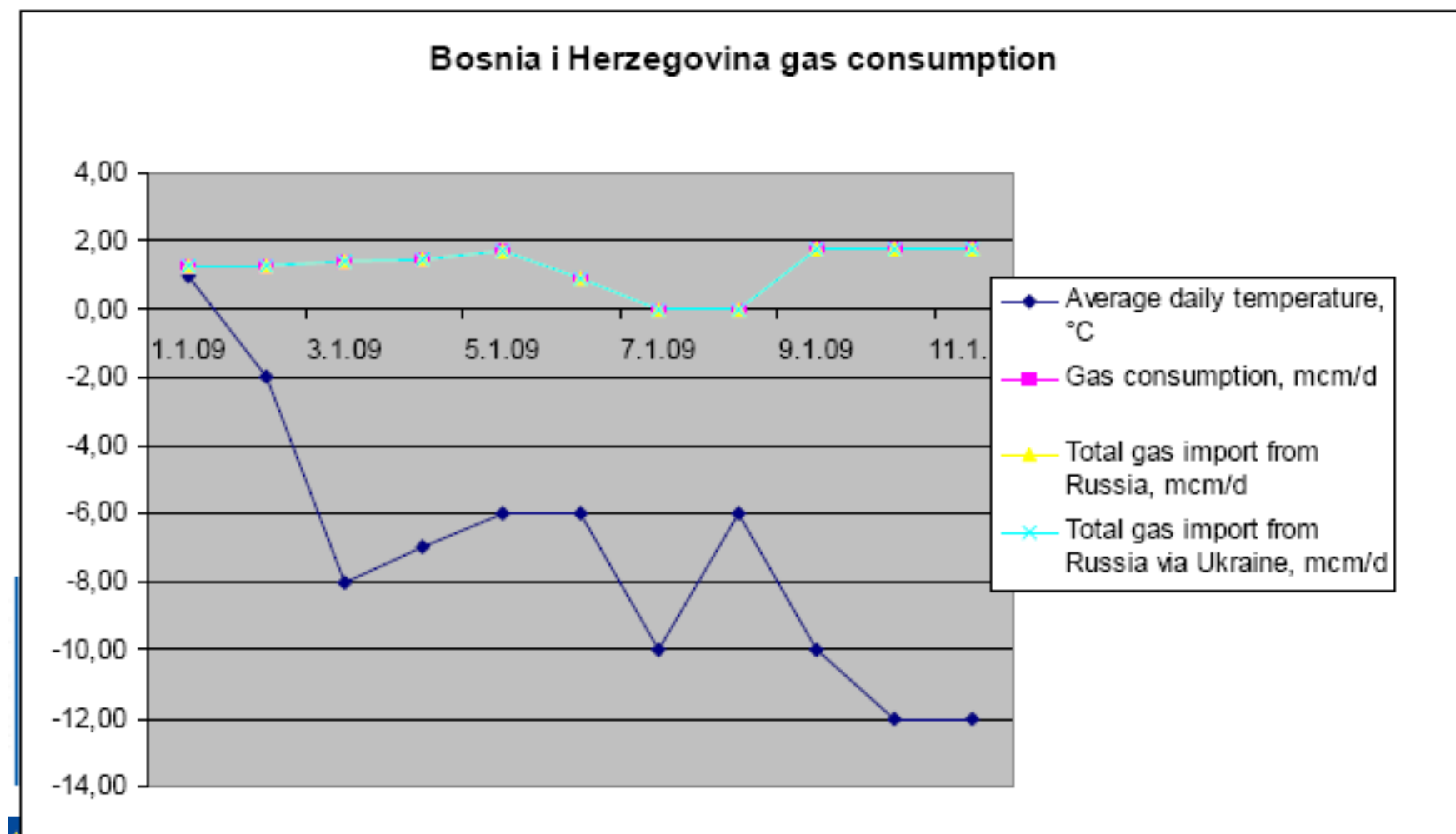
- Serbia has little choice but to stick with Russian gas
 - In December they signed a deal with Moscow
 - Gazprom buys Serbia's oil and gas company Naftna Industrija Srbije
 - Diversification with Gazprom
 - New pipeline (part of South Stream)
 - Completion of gas storage facility

- Consumption: 0,4 bcm annually (60% residential)
- Single line from Russia – Ukraine - Hungary - Serbia
- NO storage facility
- NO production
- Normal daily winter consumption: 1,8 mcm/day
- Daily loss of Russian import: 1,8 mcm
- Economic loss from curtailment: 240.000 inhabitants without heating on Jan 7 (-10 C); major impact on a few large industrial unit

BiH – the system

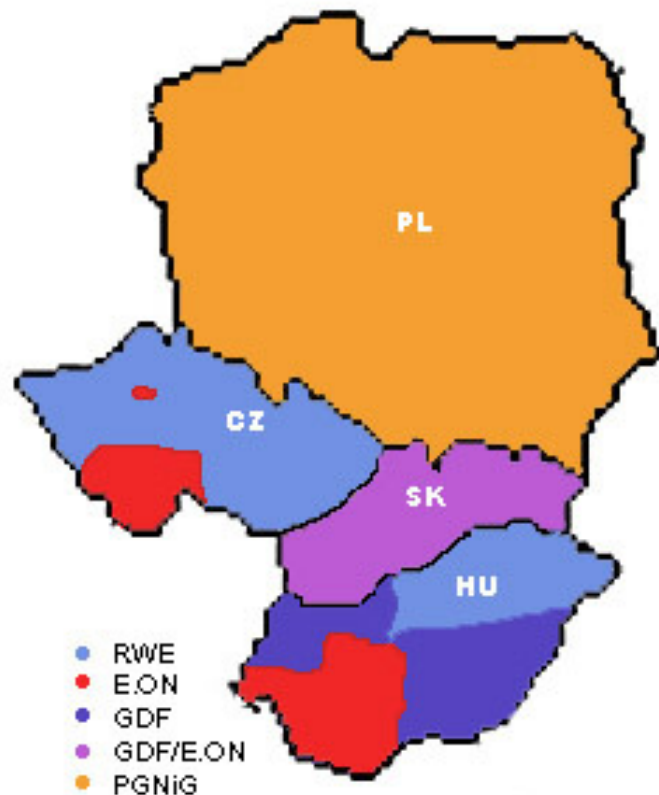


BiH – the crisis



Source: Gas Coordination Group

THE ROLE OF MULTINATIONALS IN THE REGION



**Ownership/Key Shareholder
Gas Distribution Companies**

Source: LaBelle, 2008

- Prime minister announced diversification plan to reduce reliance on Russian gas imports to 40% (from 70%):
 - LNG: „radically” speeding up the investment process of the planned LNG terminal (special legislation). (2.5 bcm by 2014)
 - Approved extraordinary legislation on March 18: simplification and shortening of the administrative procedures...
 - Signing a deal with Qatar
 - Increasing domestic production
 - To account for 30% of domestic consumption
 - Investments are needed Poland has proven reserves of 164 Bcm
 - Increasing underground gas storage from 1.66 Bcm to 4 Bcm
 - Expansion of its salt caverns
 - New interconnections
 - With Germany and Baumgarten
 - Skanled pipeline proceeds (Norway, Sweden, Denmark, Poland)
 - + demand side: progress on nuclear: government had passed a resolution to develop a nuclear power plant by 2020: appointed a government representative for Polish nuclear power.