

Renewables Strategy in energy and climate policy: a perspective of UK Energy Market Reform

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energy strategy, Brussels, 20th June

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Overview

Strategic economics of renewables

Why support renewables – strategic framework

Cost recovery, bill impacts and “insurance benefits”

The UK Energy Market Reform

Regulatory economic dimensions

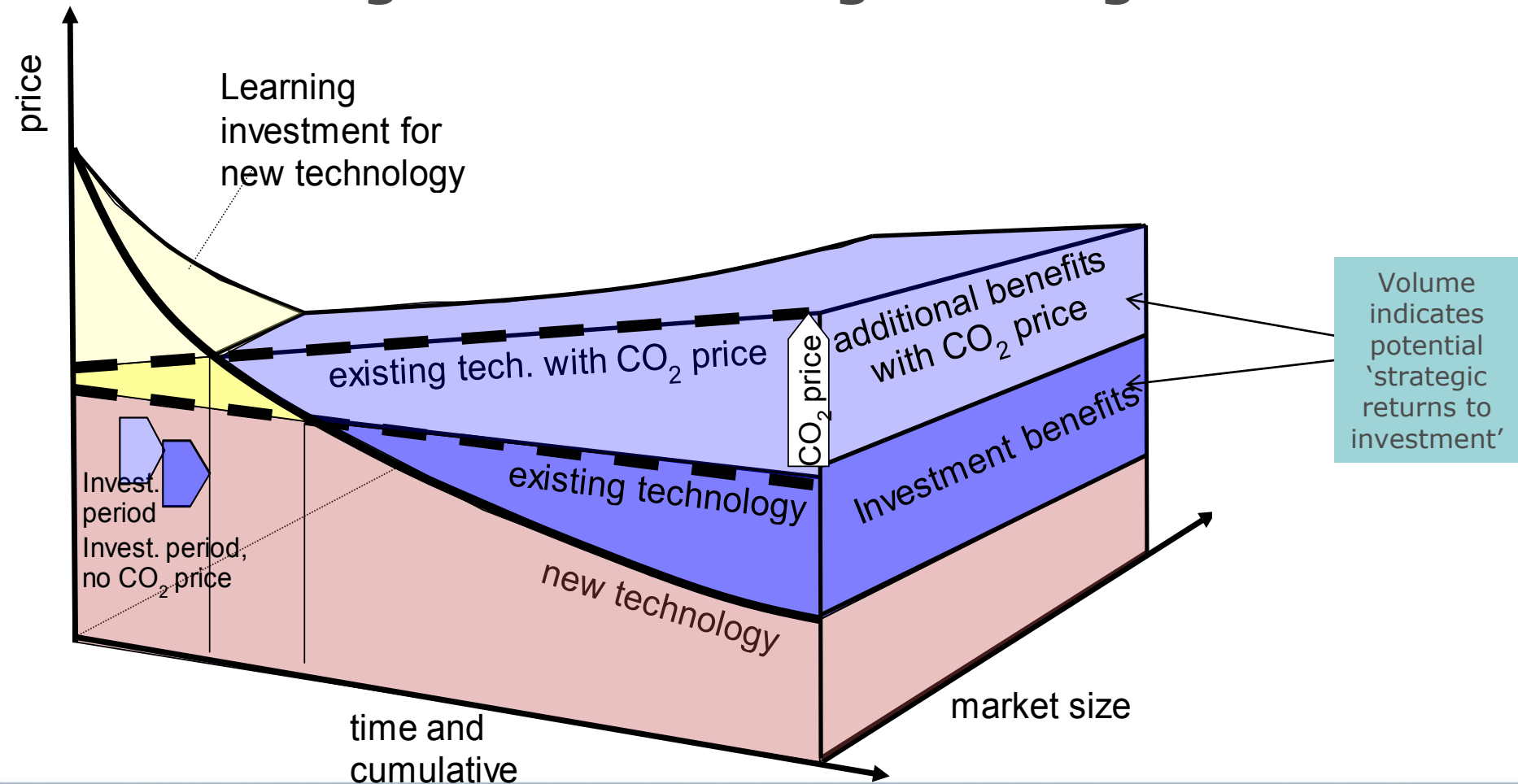
How internationalised and harmonised should supports be?

Coordination with transmission?

Implications of intermittency for balancing and related systems

Relationship to liberalisation, convergence and post-2020

In principle, strategic investment in new, clean technologies can have high strategic returns



Key questions around 'strategic deployment' of renewables for learning & cost reduction

Strategic economics:

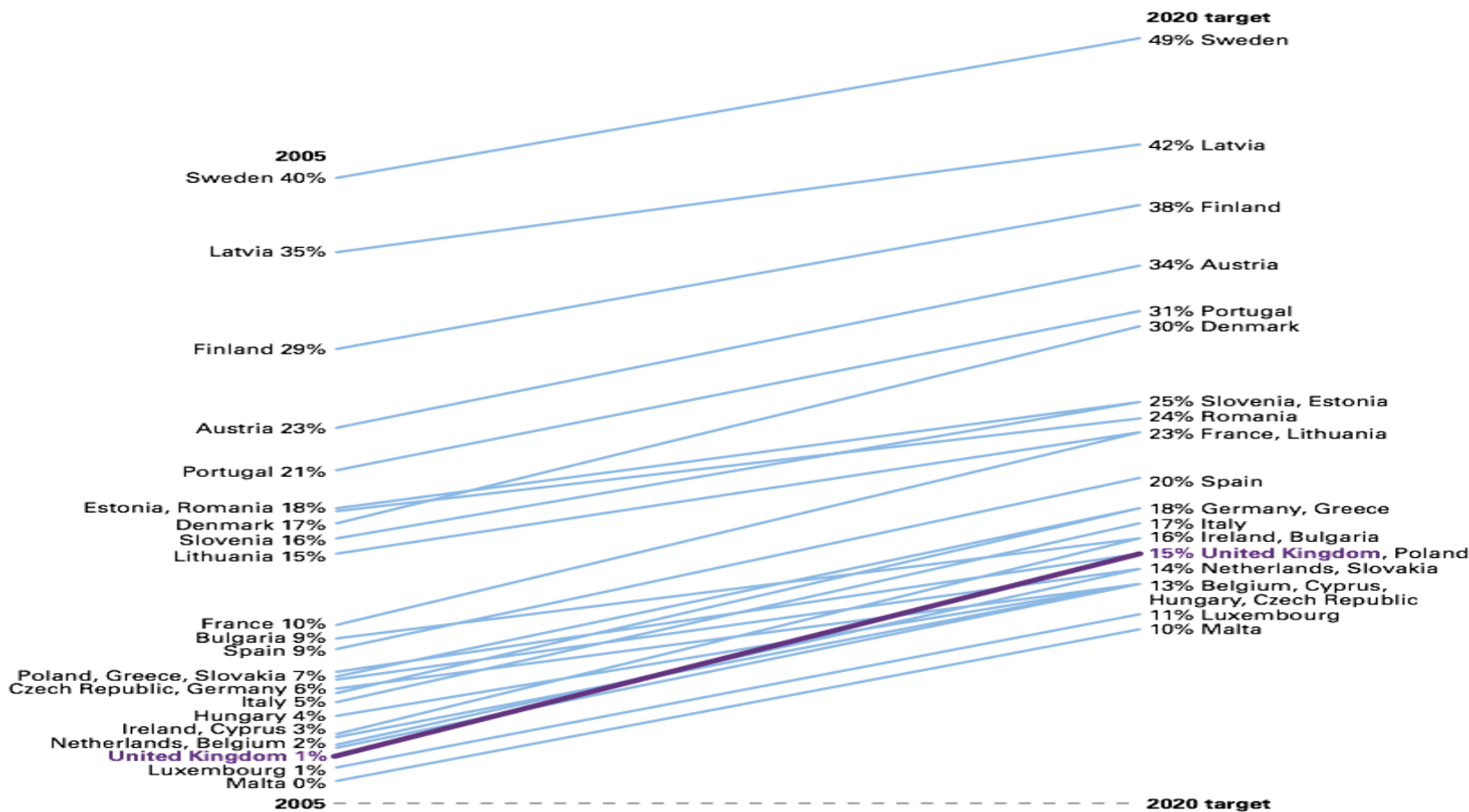
- Appropriate degree and duration of support?
- Cost recovery, bill impacts and "insurance role"?
- How to design supports to minimise the cost of capital?
- When and how to transfer to more market-based competition?

Regulatory economics:

- How internationalised and harmonised should supports be?
- How to coordinate with transmission development?
- Implications of intermittency for balancing and related systems
- Relationship to liberalisation – SEM, Third Package & Infrastructure?

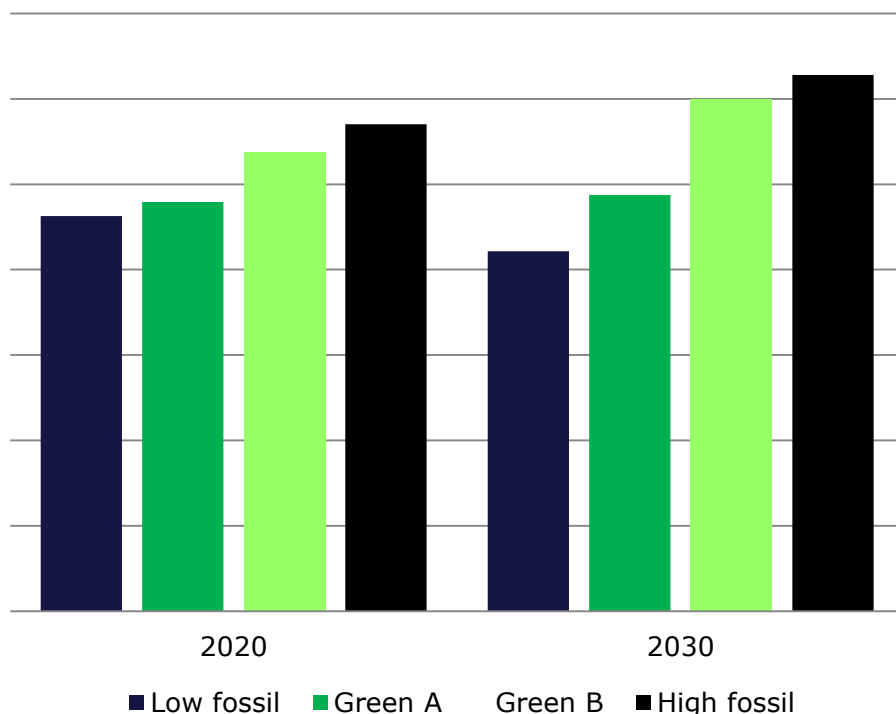
=> Illustrated with reference to UK EMR and European debates

Context: renewable targets under EC Directive: UK starting from poor position but with very high growth rate



Impacts of renewable supports on bills: an 'insurance' role of renewables investment?

Potential UK bill impacts: Renewables-intensive scenario costs between low and high fossil fuel price scenarios



- UK: Bills in green scenarios lie between high and low fossil fuel price scenarios

(See Annex for CCC bills analysis)

- Other studies: 'merit order', investment and trade effects tend to mitigate (or even offset) costs of renewables support

(See studies cited in EC Renewables Communication, 6 June 2012: Impact Assessment (SWD(2012) 149, Section 5)

Note: fossil fuel scenarios assume lower carbon price

Origins of the UK Energy Market Reform

- Liberalised market helped to cut energy prices, but focus on short term shareholder value also resulted in:
 - Collapse of R&D, “asset sweating”
 - Limited investment and focus on gas for new power generation
 - Growing concern, whether market will deliver security or sustainability
 - Increasingly complex mix of instruments to ‘fix’ this, including Renewables Obligation
- Ofgem’s “Project Discovery”: Could existing market arrangements deliver secure, sustainable energy at an affordable price? A: “**No**”:
 - Inadequate price signals for security of supply
 - Uncertain long-term price signals for decarbonisation
 - Inframarginal nature of baseload (price takers, the opposite of gas)
 - Increased risks in gas market
 - Some consumers may not be able to afford adequate energy

Designing supports to minimise cost of capital - UK evolution to “CfD-FiTs”

- Fundamental change, central element CfD-FiTs:
 - *Long term Contract for Difference* on electricity price, plus
 - *Feed-in-tariff* support
- *Other components:* capacity mechanism, carbon floor price, EPS
- Long term contracts (CfD-FiTs) – some BIG issues in implementation
 - Negotiation!
 - Minimising distortions to wholesale electricity market
 - Concern about ‘abandoning competition’
 - Cost recovery
 - Interaction with capacity mechanism
 - How and when to transition to a competitive model in the future
- Other elements raise additional challenges

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Internationalisation and harmonisation

- EC Communication, “Renewables sector has developed faster than foreseen ... Many Member States experienced rapid growth .. 18 of them are ahead of the trajectory set out in the Directive”
- Renewables Directive has various provisions to allow international transfers; only two MS current signalled intent to use
- UK DECC enquiry launched to examine:*
 - availability and potential for trading renewables
 - potential costs, benefits and risks to the UK
 - issues and barriers which will need to be addressed
- EU system studies show rising value of international cooperation as the scale of renewables contribution grows
- Forthcoming CEER study highlights the scale and potential costs of continued wide differences in support schemes between MS

* <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/renewable-energy/5140-call-for-evidence-on-renewable-energy-trading.pdf>

Coordination with transmission development

- Infrastructure package points to c. €100bn of priority trans-European transmission projects – how planned, funded, regulated?
- GB experiencing huge increase in transmission investment: :
 - government imposed “Connect and manage” approach to avoid long queue for RES generators
 - new RIIO model provides longer-term framework, with additional allowances available for anticipatory investment
 - offshore (“OFTO”) successful in raising new finance
 - Ofgem now reviewing alignment of different regimes for onshore, offshore and Interconnectors
- North Sea grid (11 countries in NSCOGI) poses unprecedented coordination challenges; maybe parallels in Mediterranean?
- Increasing role for ACER ?

Implications of variable sources for balancing and related systems

- Balancing services, additional potential benefit from interconnection?
- Risk of balancing mechanisms *either*
 - excessively penalising variable sources, where system imposes balancing costs without recognising statistics of aggregation
 - *Or* removing incentives for intermittents to improve forecasting
- Amplified if transmission constraints - recent examples of high payouts and concern about 'gaming' of balancing rules
- Possible to harness wind for very short term grid control & voltage dips?
- Regulatory challenges yet to be resolved – ACER working on Framework Guidelines for electricity balancing

There are challenges for regulatory governance and decision-making

- Eg. Ofgem Primary Objective established under 2008 Energy Act as
“Protect the interests of present and future consumers”
- Ofgem developing internal Impact Assessment procedures to cover Strategic and Sustainability dimensions, as the tool to represent the second half of its primary responsibility
- Ultimately, where there are trade-offs between the interests of present and future consumers, only the relevant Authority (in this case, UK Gas and Electricity Markets Authority) can decide

Possible tensions between present form of liberalised markets and strategic investment?

- hard to find examples of capital-intensive energy systems constructed in liberalised, shareholder-driven energy markets
- potential tension amplified by need to deliver strategic goals in which the major public benefits (security, environment) are not adequately (if at all) priced
- coordination of major new generation and transmission difficult to achieve in decentralised ways
- EMR illustrating some of the tensions – what is appropriate role of government, and of regulator, in securing such investment?

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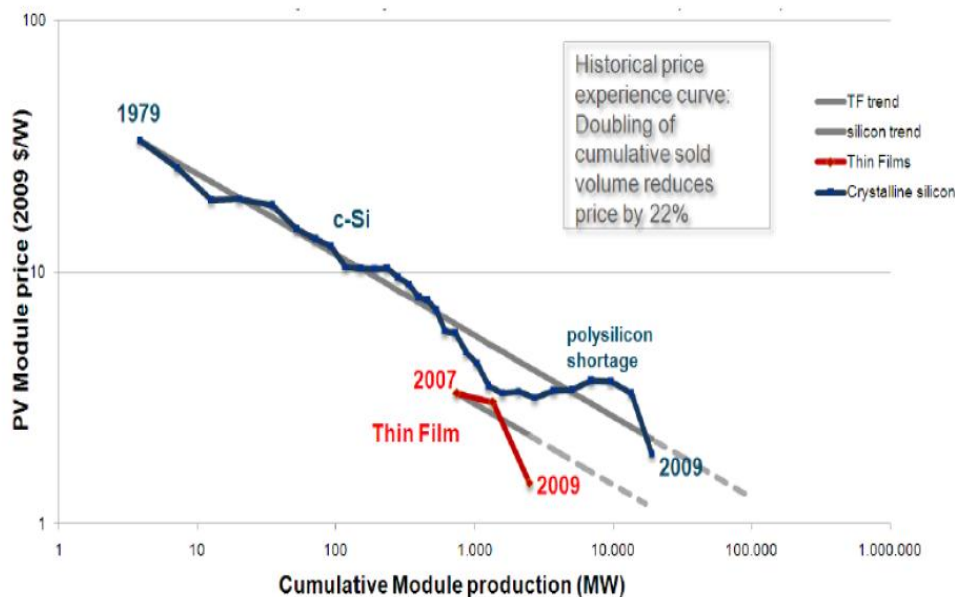
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Technology cost reductions

- 'evidence of concept, but far or fast enough for 2020'?

PV

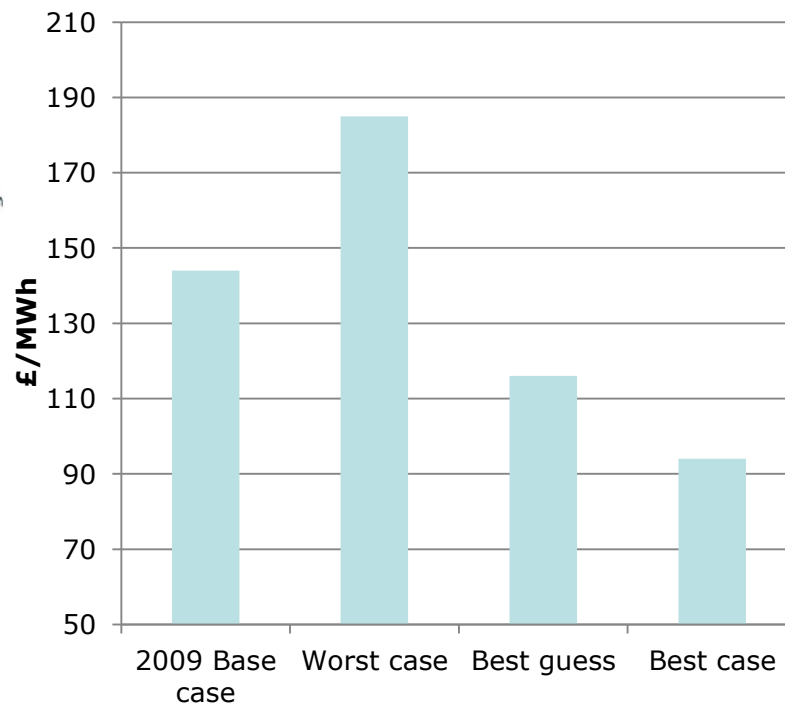
FIGURE 2.2: PV MODULE PRICE EXPERIENCE SINCE 1979 (2009\$/W)



Source: EPIA

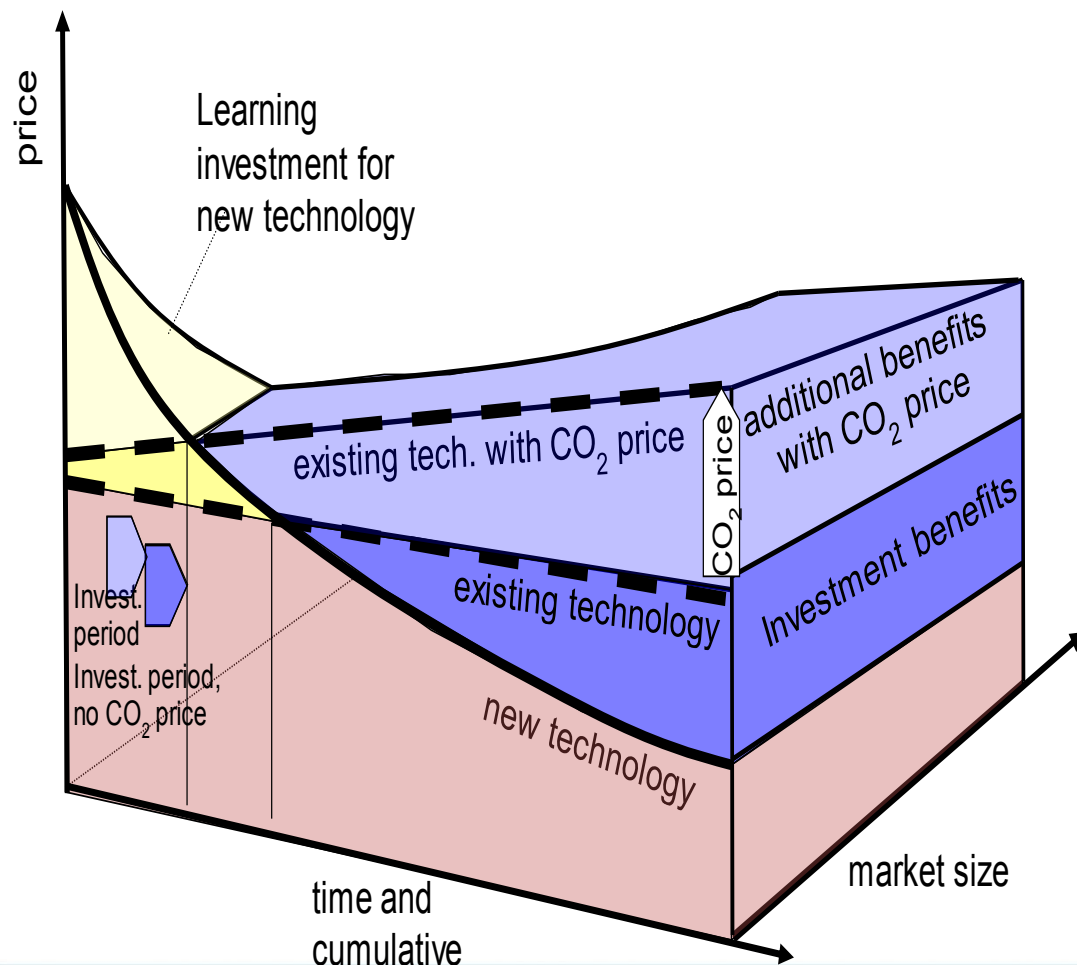
Offshore Wind

Offshore wind levelised costs projections (mid 2020s)



Reference: UKERC report "Great expectations: The cost of offshore wind in UK waters"

To realise strategic returns, timing is everything ..



Whether and when to move from technology-specific supports to market should depend on:

- Level of technological and industrial maturity
- Elimination of regulatory or infrastructure barriers
- Technology-specific vs general carbon or security-of-supply benefits
- Adequate and robust 'bankable' carbon price

Thank you !

ofgem

Promoting choice and value
for all gas and electricity customers

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Annex

- Further information on cost impact of UK renewable energy supports from CCC and DECC

Debates in UK over costs & consumer bill impacts

Supporting
renewable
electricity to
2020

Add up to
2p/kWh to the
electricity price

£50-60 increase
average
household
electricity bill
(+10%)

Opportunities to
offset impacts:

Households:
energy efficiency

**Electricity-
intensive industry:**
e.g. Tax rebates

Supporting
renewable heat
to 2020

Under current
financing
approach will not
increase bills

Fiscal support of
around £2bn per
year by 2020

Beyond 2020

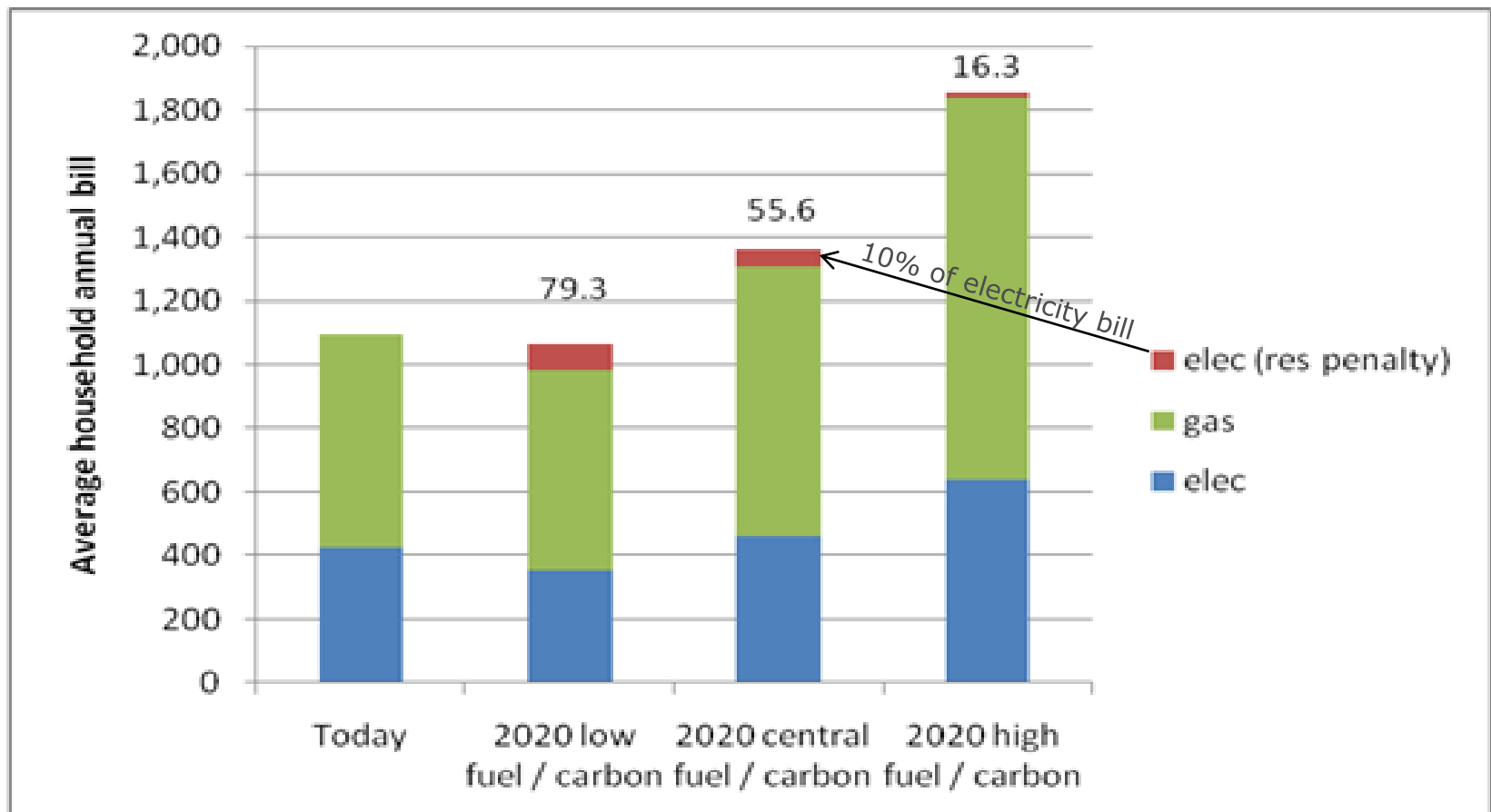
Cost reductions,
rising carbon price

Limited impacts
over and above
those to 2020

.. And actual
additional cost
depends heavily
on fossil fuel
scenario

The additional cost of renewable electricity supports depends on fossil fuel price trends

& large scale renewables may dampen high price risk?



Source: UK Climate Change Committee, report on Renewables (Annex)

Table 5.1: Average annual household energy bills in 2020 and impact of renewable energy ambition

	2020 (no renewables)	2020 - including cost of renewable energy			2020 - including renewables and energy efficiency		
		Low renewables costs	Central renewables costs	High renewables costs	Low renewables costs	Central renewables costs	High renewables costs
Average unit price, electricity (p/kWh)	15.6	16.7	17.3	17.8	16.7	17.3	17.8
Average household electricity bill	£520	£550	£570	£590	£470	£490	£510
Average household gas bill	£850	£850	£850	£850	£730	£730	£730
Average household energy bill	£1,360	£1,400	£1,420	£1,430	£1,200	£1,220	£1,230

Source: DECC Quarterly energy prices; CCC calculations.

Note(s): 2010 prices. Numbers may not sum due to rounding. Range for cost of renewable energy under low, central and high generation cost estimates (see Chapter 1), includes additional system costs due to intermittent renewables e.g. back-up and interconnection, and is inclusive of VAT at 5%. Based on central gas and carbon price projections for 2020 (69 p/therm, £30/tonne).