



Issues in the Transmission and Retail Electricity Market in the UK

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*15th April 2013
CRIEPI, Tokyo*

Outline

- Thanks to Aoife Brophy Haney and CRIEPI
- Background to UK transmission and retail markets
- Transmission planning and system operation debates
- Retail electricity market for domestic customers
- Implications for Japan

BACKGROUND TO UK TRANSMISSION AND RETAIL MARKETS

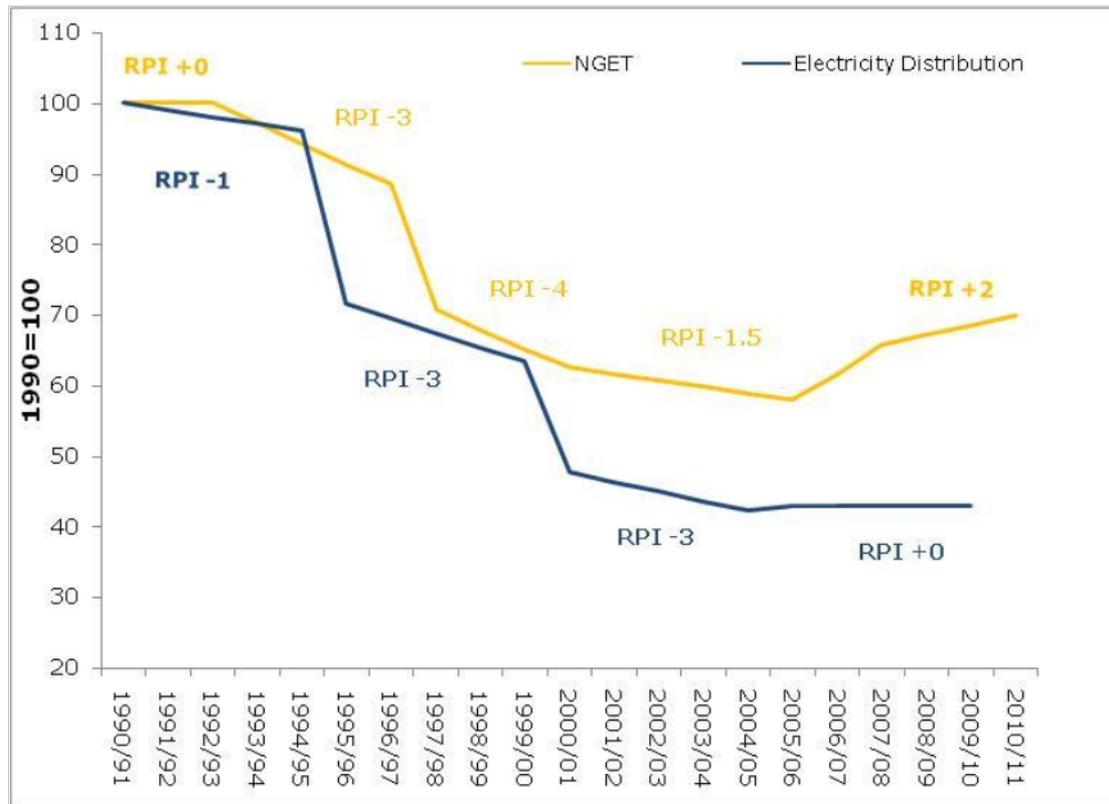


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Transmission system prices/costs

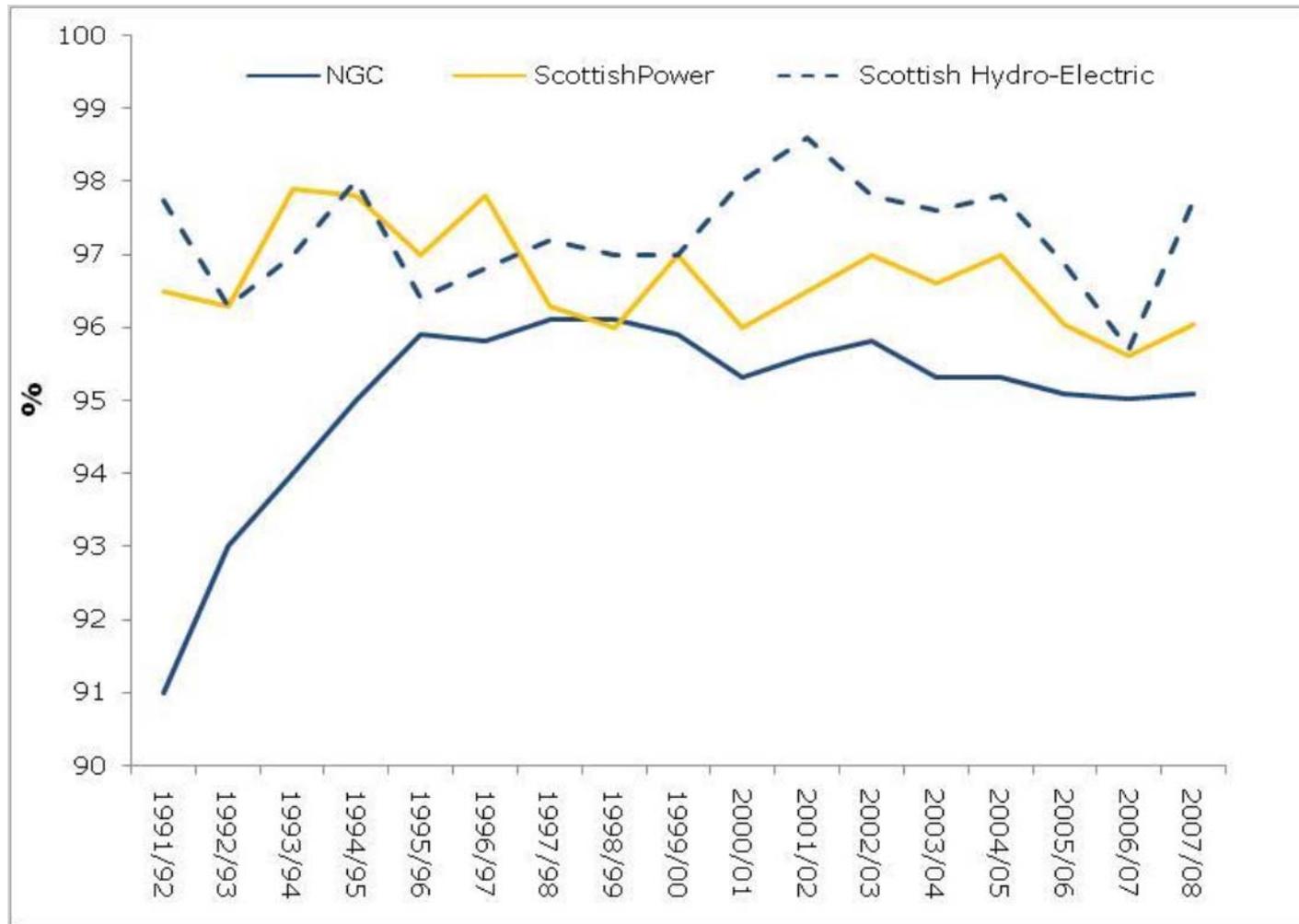
Price control revenue allowance adjustments for electricity networks - 1990 to 2011



NGET =
National Grid
Electricity
Transmission

Source: Ofgem (2009, p. 5)

Transmission system annual availability



Source: Ofgem (2009, p. 20)

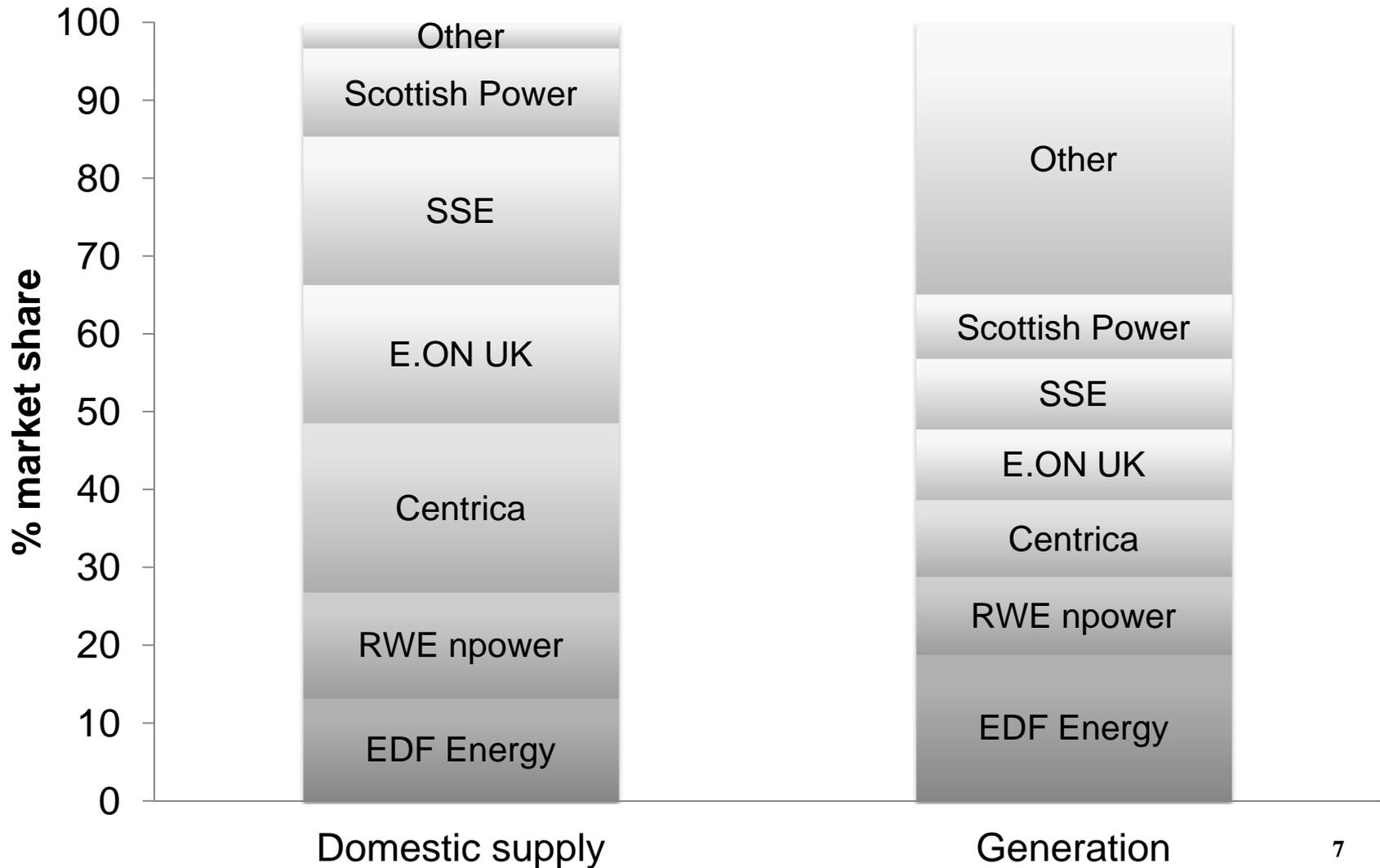
Policy aims for retail market

- Value, choice and simplicity for customers
- Action on fuel poverty
- Competitive market with low margins

- BUT more investment in large, risky investments needed conflict

Can retail competition work?

Electricity Generation and Supply in GB - 2010



Source: Data from Bloomberg New Energy Finance 2012



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TRANSMISSION PLANNING AND SYSTEM OPERATION DEBATES

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EU policy on transmission

- First Electricity Directive 1996 – accounting and management unbundling
- 2nd energy package (2003) – legal unbundling and for management staff of TSOs not to take decisions in other parts of vertically integrated company
- 3rd energy package (adopted July 2009) – ownership unbundling plus alternatives of ISO (second-best; removes conflicts of interest) and ITO (legal unbundling) models; established European Network of Transmission System Operators for Electricity (cooperation between national TSOs)



UK history of transmission arrangements

- National Grid Electricity Transmission – GB System Operator since 2005 with implementation of BETTA and operates interconnectors between England and Scotland.
- National Grid Electricity Transmission TO in England and Wales.
- Scottish Hydro Electric Transmission Limited and Scottish Power Transmission Limited – TOs in Scotland.
- Scottish firm transmission ownership is related to Scottish independence.

We have three transmission planning regimes

- Integrated Transmission Planning and Regulation (ITPR) project at Ofgem.
- Onshore regime – annual locational per MW connection charges, no short term locational signals, transmission companies propose investment plans which are approved by Ofgem.
- Offshore – generators build offshore wind assets and connect them to the shore line then these are auctioned by Ofgem.
- Offshore Interconnectors – merchant links which exploit price arbitrage opportunities between countries.

Can 3 regimes be part of the 'ideal' regime?

- Ideal regime (following Hogan!):
 - ISO manages existing system across entire UK
 - Efficient short term nodal prices (LMPs) in place
 - Individual ITOs responsible for availability of their lines.
 - ISO then evaluates all proposed transmission investments using social cost benefit methodology – including reliability, economic and public policy elements
 - Investments voted on by parties (where revelation of private valuation important as for New York transmission), go ahead if super-majority.
 - Investments tendered competitively for construction and maintenance (subject to max price ceiling).
 - Investments then charged to the beneficiaries.

Three from one?

- Onshore regime can be seen as a response to the meshed nature of the onshore network and integration of TO and SO in a meshed network. There are many small investment and operational improvements to be evaluated in such a system and as such it makes sense for the 'ISO' to delegate these decisions to a single integrated ITSO (NGET in England and Wales) to save on transaction costs. (This is essentially what happens with Distribution).

Three from one?

- Offshore we are faced with large discrete investments which are easily separated from the existing networks and where the beneficiaries (offshore wind parks) are clear. The 'ISO' can set up a competitive regime for these investments while not, compromising what is happening onshore, as long as the spur investments do not impact onshore regime.

Three from one?

- Interconnectors are risky and depend on an evaluation of market prices at both ends of the interconnector. This is fundamentally different from a transmission investment driven by physical flows between identifiable generators and suppliers (i.e. annual average flows are misleading guides for interconnector investment). The 'ISO' can delegate this to parties willing to take the risk of building such assets, some of whom will be 'foreign' (in particular overseas TOs).

Three regimes make sense when

- Three regimes make sense when they add up to delegated elements of a sensible market based solution (a.k.a. 'ideal' solution).
- So while sensible market based arrangements are theoretically possible in transmission, in practice transaction costs of separation and contracting and risk mitigation mean that some form of formal coordination, licensed monopoly and regulation is preferable (there are several variants of each).



If we have three regimes

- Three regimes can work if they are clearly defined subsets of a sensible whole.
- This requires the basic model at the heart of the system to make sense, i.e. that all available information is being sensibly exploited (e.g. nodal pricing, investment appraisal).
- It also requires clear addressing of the seams issues that arise, e.g. can't allow subsidy arbitrage and competition between regimes as in Irish wind example.
- Also need to recognise that circumstances may mean that three regimes need to be altered to accommodate emerging realities, e.g. conflict between SO and TO roles of NGET, may give rise to need for 'deep' ISO with planning responsibility.
- The three regimes we currently have are merely a practical response to past realities.

If we have three regimes

- Need to recognise where regimes are fundamentally addressing the same problem and work on consistency and cross learning.
- For example:
 - We need better price signals for locating interconnectors.
 - More use of tendering of assets onshore given consistency of size of assets with offshore.
 - Clearer distinction between treatment of old and new assets.

Closing thoughts on transmission system

- Transmission optimisation is just part of the social welfare optimisation and should be subject to some of the need for decentralisation which characterises markets generally.
- Multiple regimes are a reality in the electricity wire networks (e.g. transmission versus distribution).
- At the heart of this are the costs of information processing, lack of competition, transaction costs and historic patterns of asset ownership. These explain why we have the regimes we do.
- What we need to consider is whether the current regimes/regime boundaries are appropriate

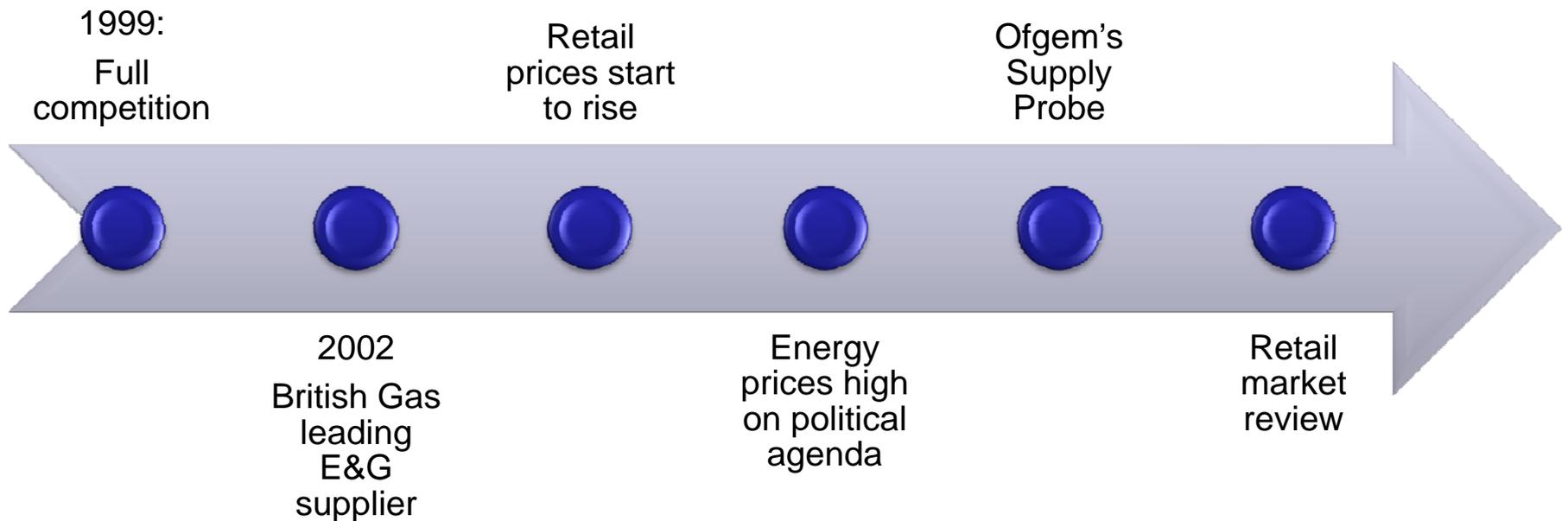
Conclusions on Transmission

- The creation of NGET as an ownership unbundled ITSO was a great success (Pollitt, 2008).
- Dispersed asset ownership stopped this happening in the US: ‘if you want an ITSO, assume an island’.
- However the US situation suggests that an ISO model has much to recommend it (Pollitt, 2012):
 - avoiding the costs of transmission asset ownership reorganisation
 - facilitating more efficient operation of the transmission system and trading benefits over a wide area.
 - specialising in the IT intensive part of the electricity system and developed sophisticated and efficient real time management algorithms
 - evolving their role in calculating the system wide benefits of future investments and the associated network planning.

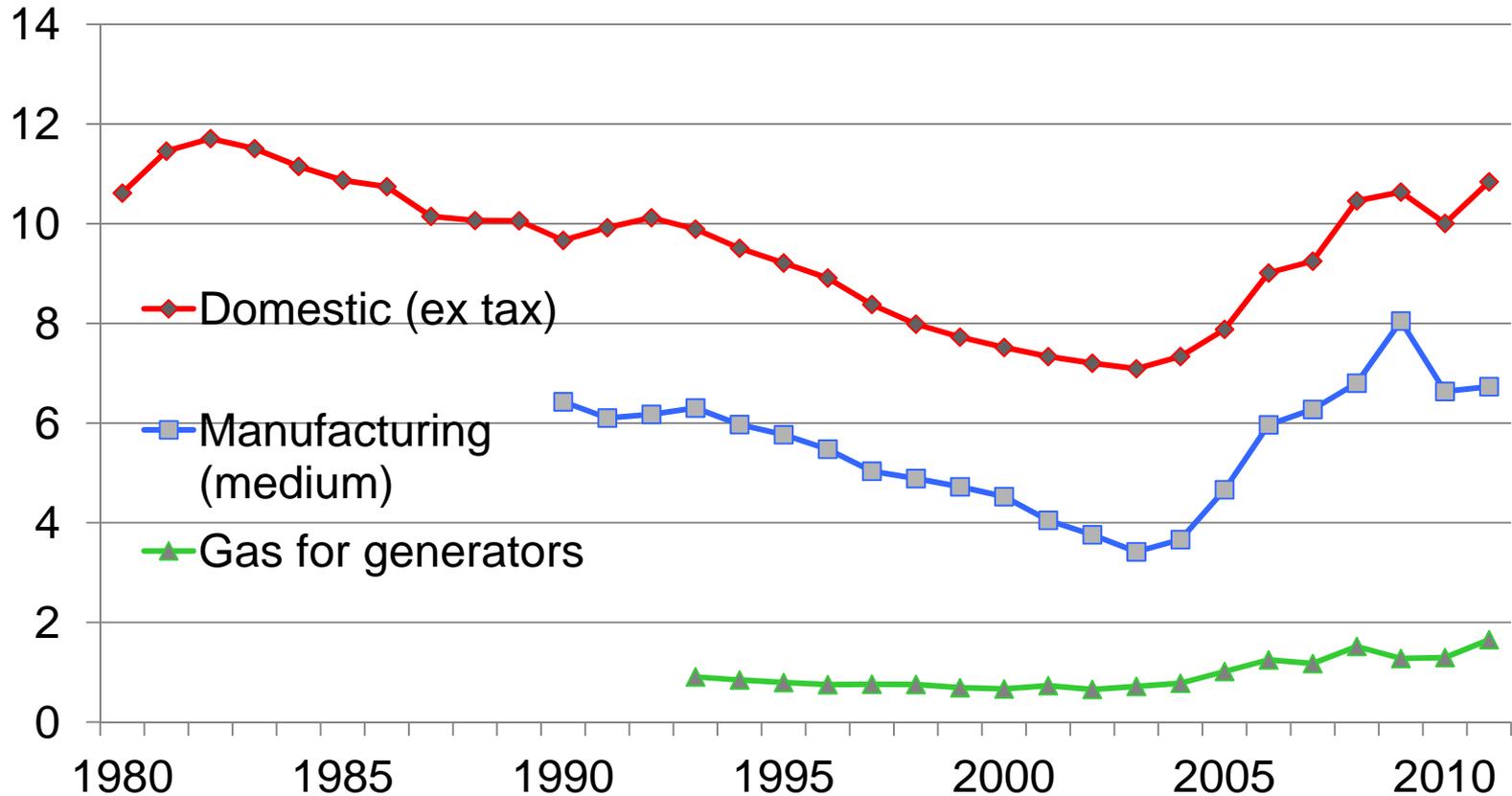
RETAIL MARKET REFORM

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Retail (household) Market timeline

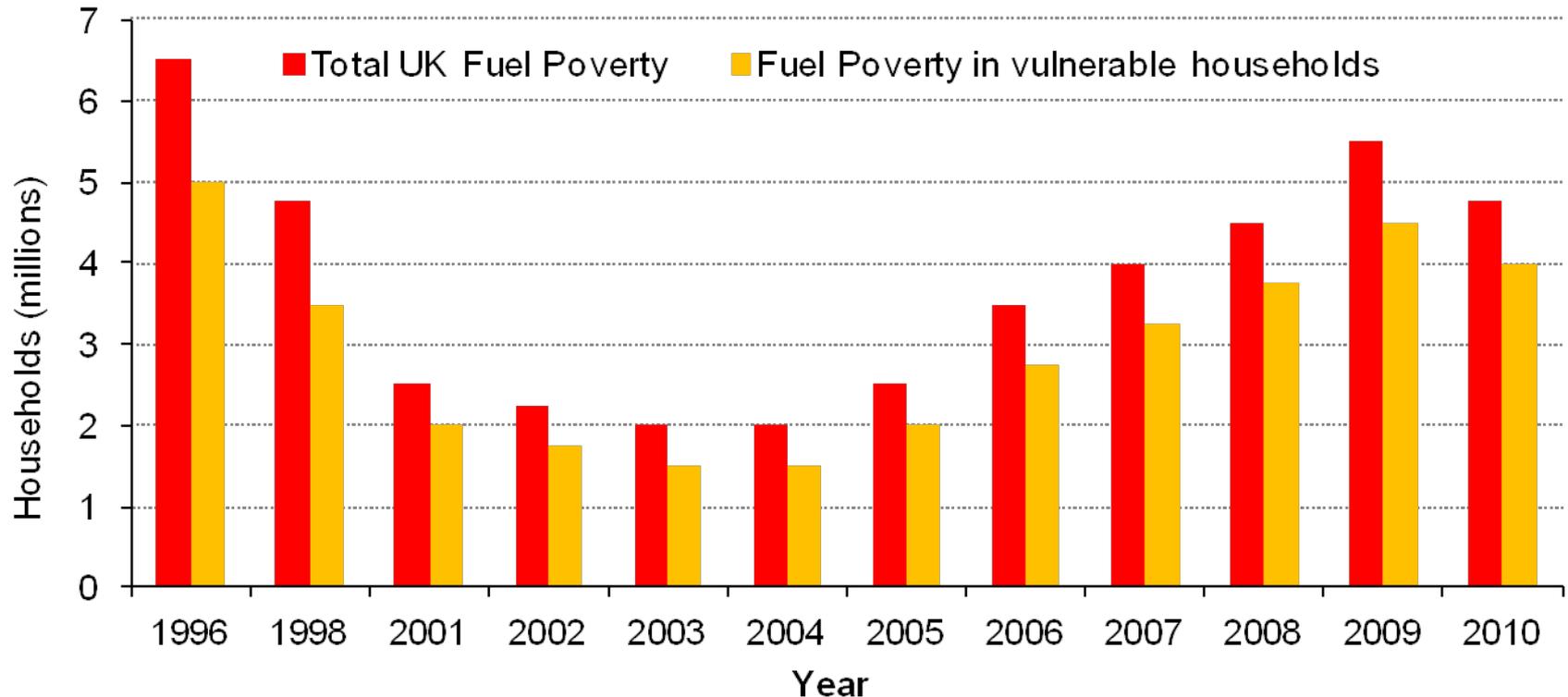


UK electricity prices – pence per kWh (2005 prices)



Source: DECC

Fuel poverty in the UK

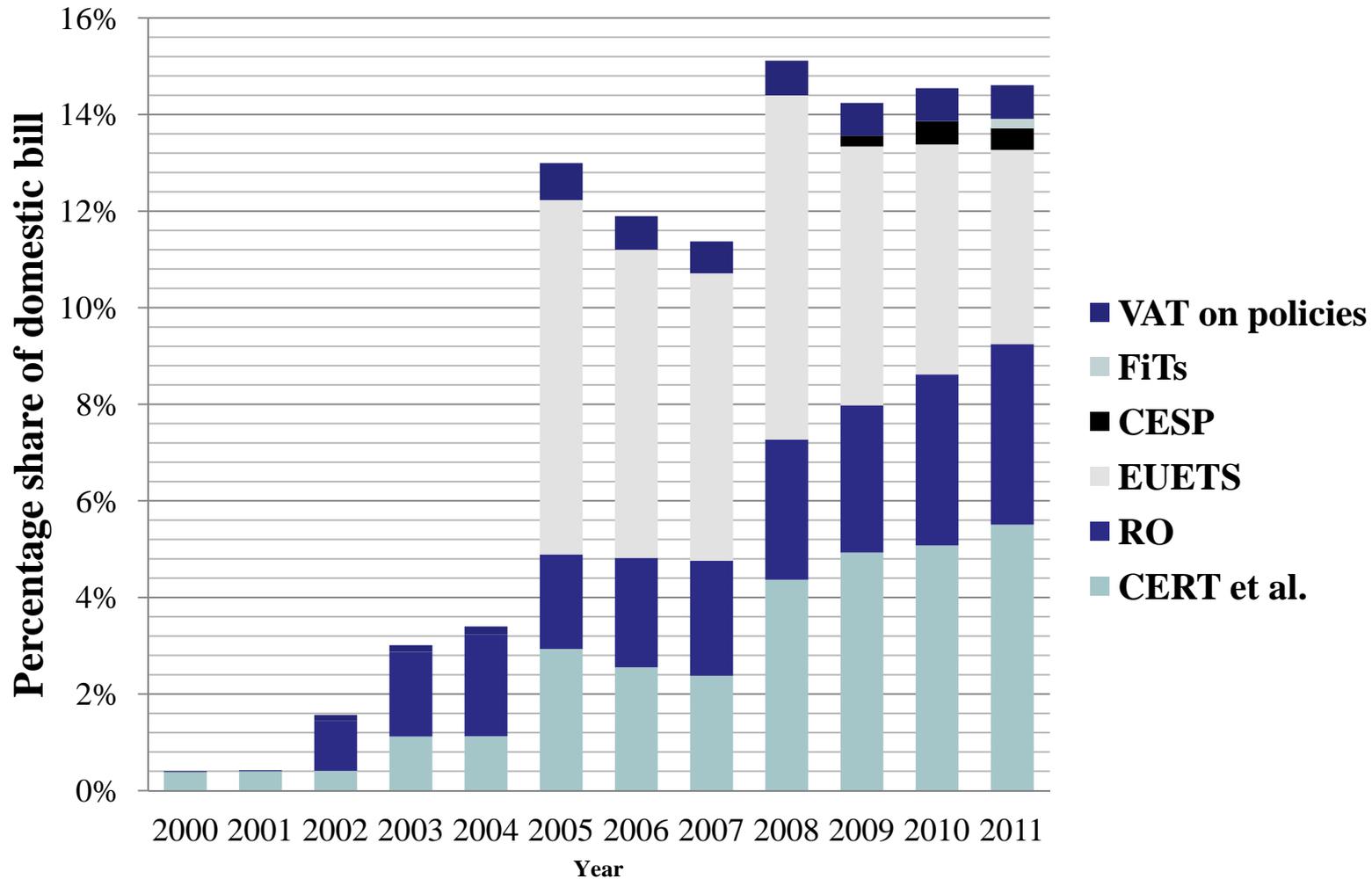


Source: DECC 2012, p. 9

Fuel poverty – More than 10% of income spent on fuel to maintain adequate warmth

A vulnerable household is one that contains the elderly, children or someone who is disabled or has a long-term illness

The current cost of energy policy on bills



Note: Generation based only, excludes transmission and distribution policy costs.
3300 kWh consumption. Source: Chawla and Pollitt (2012).

2008 Energy Supply Probe

- Study of the “state of the GB energy supply markets” launched in February 2008
- Main findings:
 - Big 6 suppliers without a significant competitive fringe
 - Barriers to entry and expansion for new entrants
 - Small group of engaged customers
 - Switching mistakes
 - Differential pricing (within and out-of-area customers; payment types; single versus dual fuel)
 - Vulnerable customers not able to access best deals

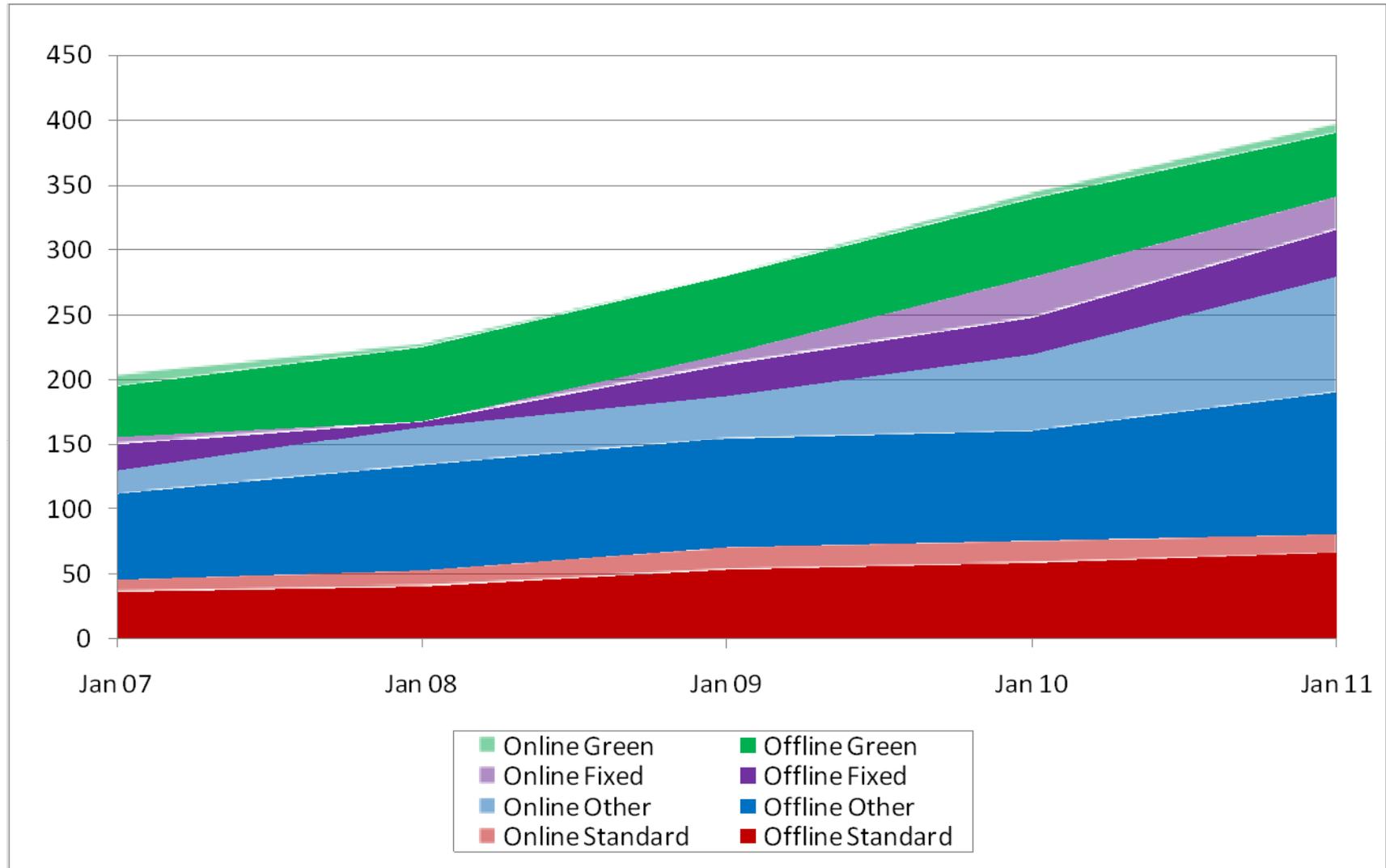
New obligations on suppliers 2009/2010

- Remove “unjustified price differentials”
 - Prepayment customers
 - In-area customers
- Promote competition and customer engagement through:
 - Better billing information
 - Helping vulnerable customers
 - Improved sales and marketing

Retail Market Review (RMR) - 2011

- Initial proposals
 - Improve tariff comparability
 - Enhance liquidity
 - Strengthen remedies from the Probe
 - Improve reporting transparency

Number of tariffs available to domestic consumers on 1 January



Source: Ofgem 2011, p. 22

Retail market review – 2012-13

- 2013 domestic bill final proposals:
 - Limit of 4 tariffs per fuel, meter and payment type
 - End to multi-tier tariffs, all tariffs as standing charge and unit rate structure
 - Regular information about cheapest deal re: savings if customer switches to cheapest deal
 - Putting customers on the best tariff when contract ends
 - New metric, Tariff Comparison rate, to make comparison easier.

Criticism: prices will increase (Littlechild 2012)

- Putting customers on the best tariff –
 - Suppliers are likely to withdraw the best tariff
- Reducing the number of tariffs, restricting the types of tariffs and use of discounts
 - “Prevents competition in fixed-price fixed-term contracts and temporary offers”
 - Discounts likely to just be reduced or removed

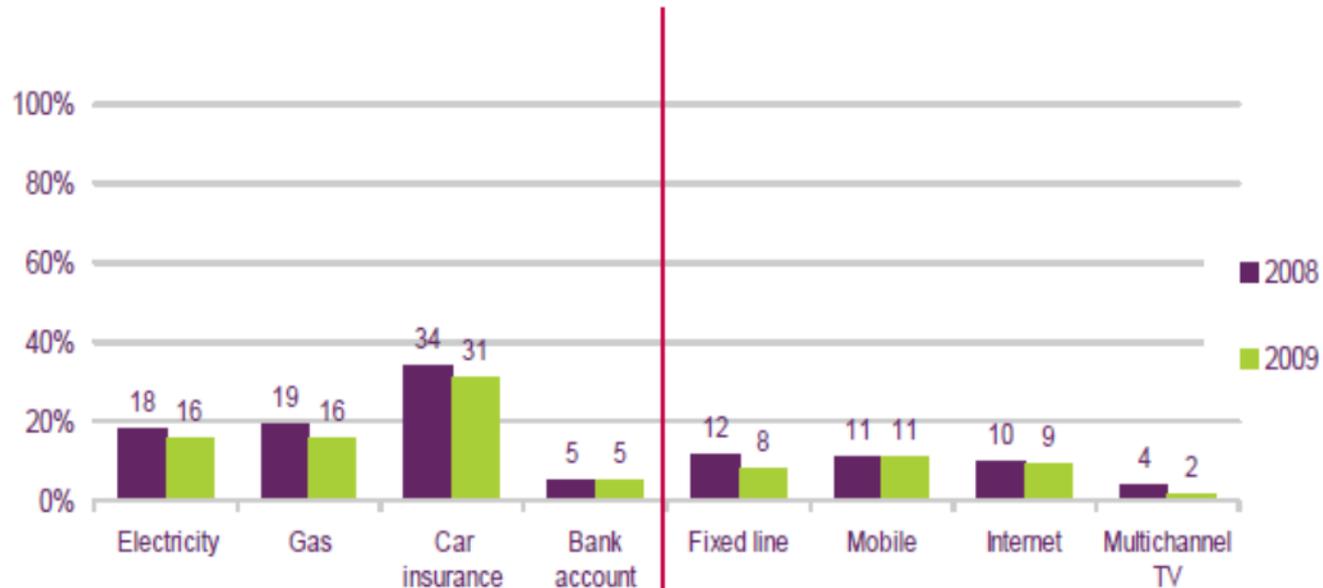
Criticism: Innovation will suffer (Littlechild 2012)

- Restrictions in number and type of tariffs
 - Suppliers unlikely to risk introducing new tariffs if they have to withdraw one of four existing ones to do so
- Direct conflict with smart metering
 - Aims of smart metering: increase information, allow for broader range of tariffs and more complex tariffs
 - Limiting tariffs a barrier to evolution of smart metering

Note: Smart meters currently not significant, but some evidence that semi-smart meters are valued by customers (in Northern Ireland).

Was there actually a problem?

Figure 9: Proportion of consumers who have switched communications and utilities providers in the last 12 months

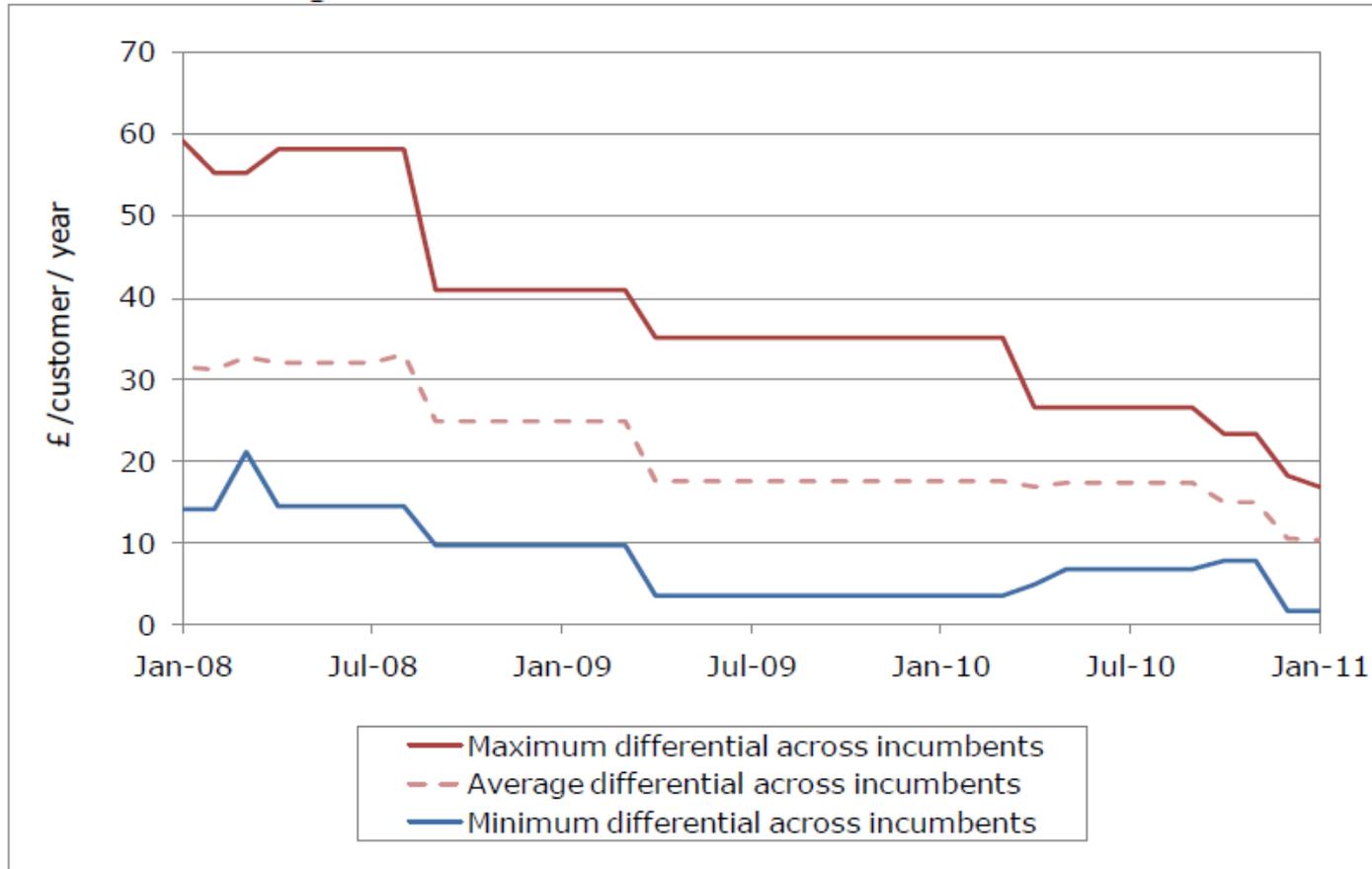


Base: All adults with fixed line (2008, 941) (2009, 781) mobile (2008, 1270) (2009, 1231) internet (2008, 460) (2009, 388) multichannel TV (2008, 896) (2009, 837), electricity (2008, 1309) (2009, 1226), gas (2008, 1125) (2009, 1069), car insurance (2008, 1107) (2009, 1019), bank account (2008, 1418) (2009, 1350)

Source: Ofcom Consumer Experience Report 2009

The benefits of switching

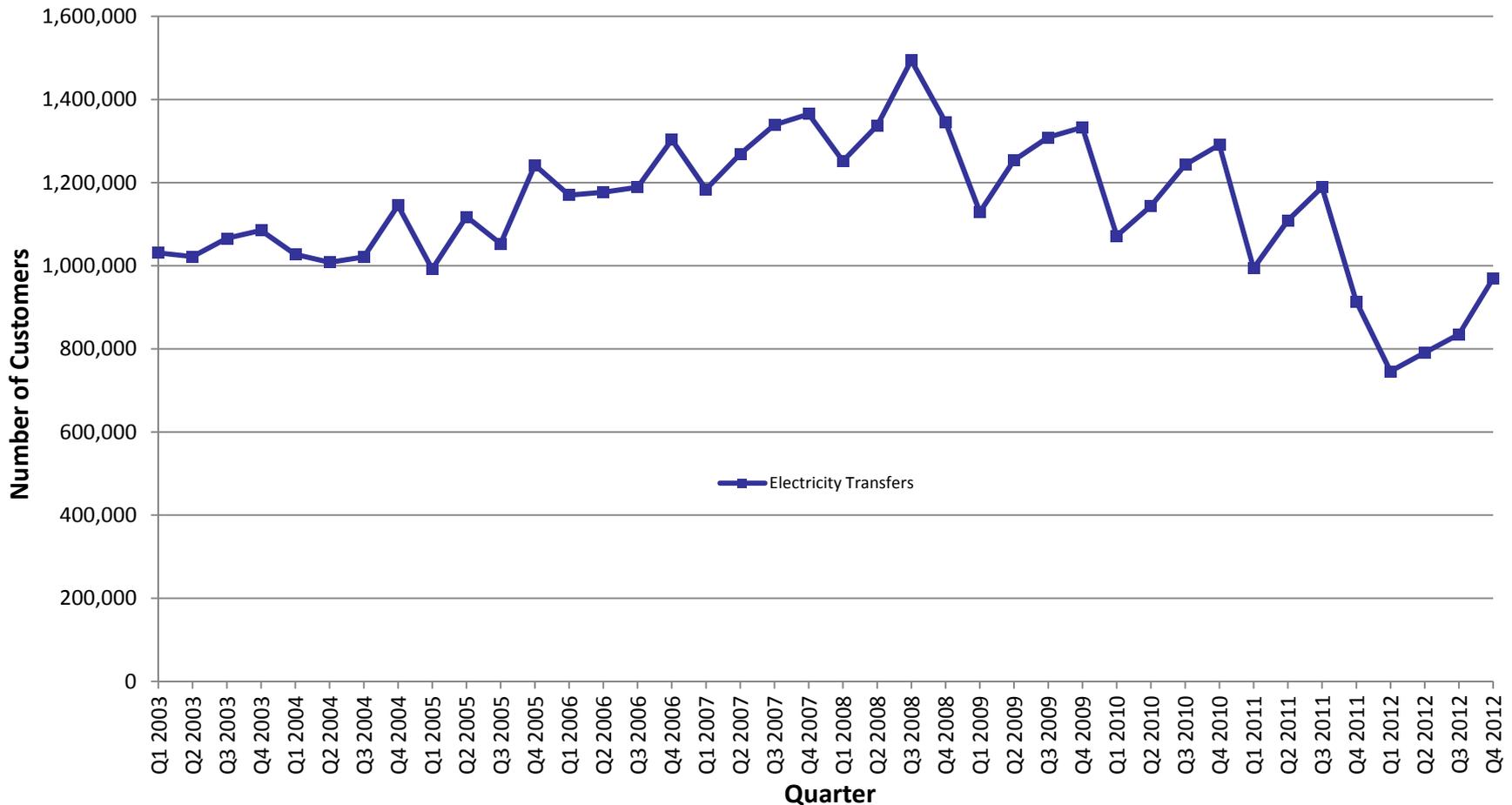
The impact of intervention?



Source: Ofgem analysis on data from TheEnergyShop.com

Differences between areas in which each company is an incumbent and those where it is an entrant, annual bill for credit electricity customers, corrected for network charges

Domestic electricity transfers in GB – The impact of intervention?

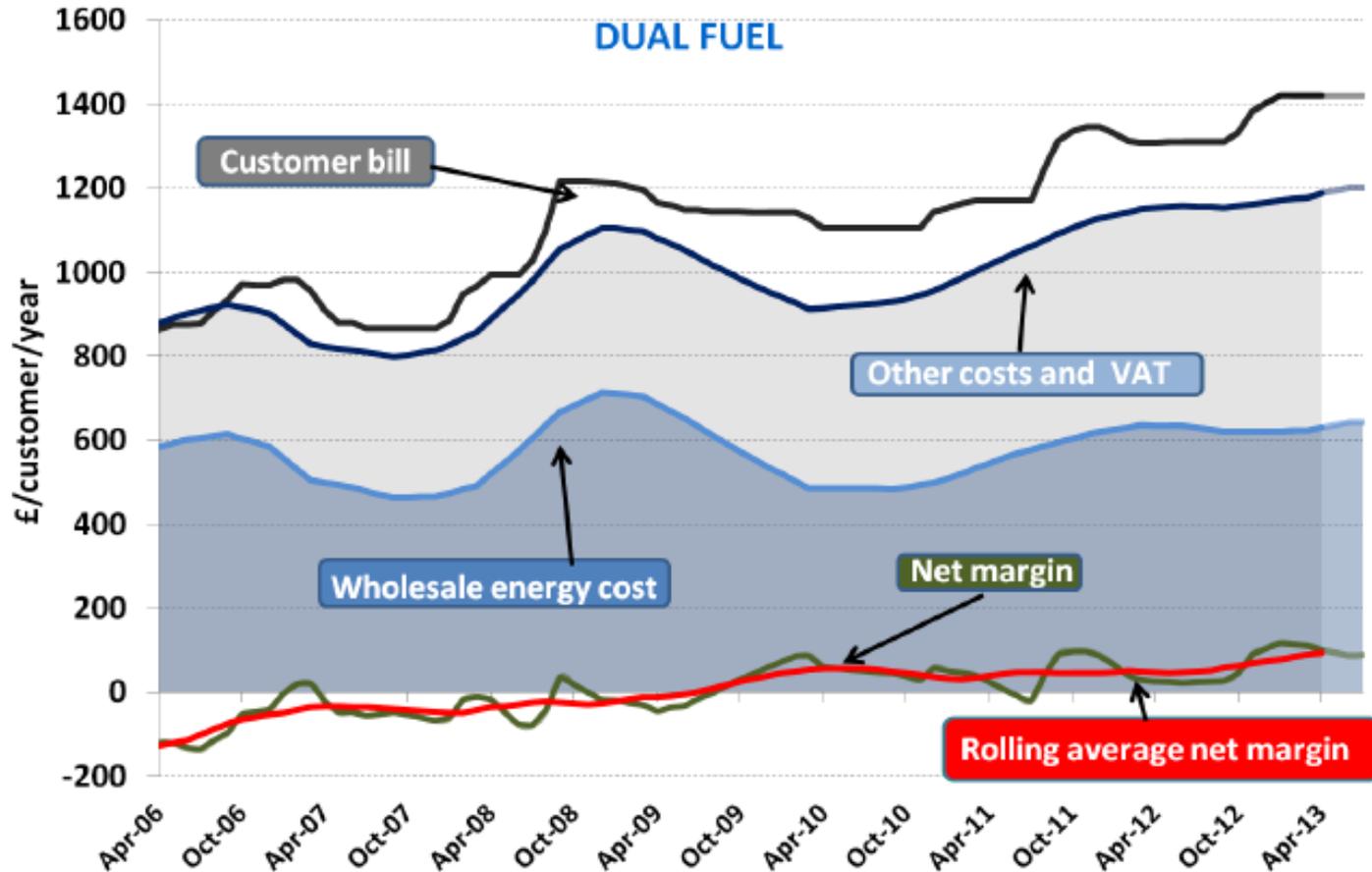


Source: DECC, Table 2.7.1. Transfer statistics
Total electricity customers 2011 approx. 27.5 million

Typical Retail Bill Evolution

The impact of intervention?

Typical dual fuel customer bill, costs and total indicative net margin for the next 12 months



Source: Ofgem (10 April, 2013, p.2)

Profit margins

Generation margin down – retail margin up?

Table 1: 2009 and 2010 EBIT margin by sector

	2009 Aggregate margin	2010 Aggregate margin
Generation	22.5%	13.8%
All Supply	1.8%	3.8%
Domestic Electricity	2.1%	0.3%
Domestic Gas	-0.4%	5.7%
Non-domestic Electricity	4.0%	4.7%
Non-domestic Gas	-0.5%	6.2%
All segments	5.8%	5.7%

Source: Ofgem, 2012, Financial Reporting Information 2010, p.19

Conclusions on RMR

- Recent proposals based on economic fallacy
 - Tariffs available in a competitive market will not remain unchanged as new obligations introduced
 - Experience of this with non-discrimination condition in 2009 (increases in out-of-area prices)
- Conflict between need for investment and keeping competitive market with low margins
- Fuel poverty is a poverty issue not an energy-market issue
 - Helping vulnerable customers not best achieved through consumer bills

IMPLICATIONS FOR JAPAN

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Two transmission visions of the future?

- Integrated transmission, generation and retail companies belong to a former electricity system era.
- The UK has successfully modelled the Independent Transmission System Operator (ITSO), while the US has been demonstrating the value of Independent System Operators (ISOs).
- UK system seems to be evolving between the two.
- However, for Japan, both these models offer the prospect of substantial gains in operational efficiency and trading benefits over the current integrated transmission model.

Is RMR a model for Japan?

- By any measure, in 2008 the UK had one of the most competitive retail electricity and gas markets in the world.
- RMR has been a political response to the impact of rising commodity prices in conditions where imposing a final price cap is now impossible.
- *Most* economists are (correctly) only too aware that intervention to increase competition by restricting price discrimination often creates distortions.
- The retail market is being wrongly blamed for cost rises that are driven by a combination of commodity and, now, policy related price rises.
- Competition is best promoted by competitive market structures and an effective competition authority not a politically vulnerable sector regulator.

What will happen to EMR and RMR?

- Difficult to see how the UK political system can extract itself from the policy trajectory it is now on.
- To abandon EMR and revert to a European approach based on EUETS and a European tradeable renewable certificate market would threaten the UK's targets and the whole Climate Change Act.
- However the political difficulty of policy induced bill rises, high segmental profits, nuclear cost overruns and policy induced threats to energy security looks insurmountable.
- So when the irresistible force (of policy targets) meets the immovable object (of economic reality) it is difficult to see how an economically sensible energy policy can emerge.
- If only, *efficiency and equity issues* were not so frequently confused in energy policy!

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