



The Future of Electricity Liberalisation in UK

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Outline

- Current policy background
- Project Discovery
- Electricity Market Review
- RPI-X@20 and RIIO
- Towards a sensible set of Energy Policies



Current Policy Background

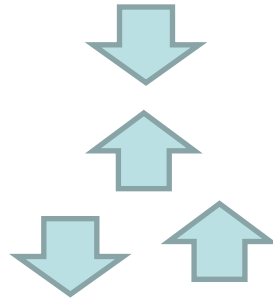
The Objectives of Energy Policy

- The impossible trinity:

- Competitiveness

- Energy Security

- Decarbonisation

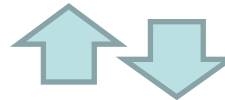


- The other ones:

- Elimination of (energy) poverty

- Renewables??

- Green jobs/economy/technology???



UK Energy/Climate Policy Areas

- **Global climate change and energy**
 - ‘DECC is working internationally to tackle the global challenge of climate change.’
- **UK energy supply**
 - ‘To achieve secure, affordable and low-carbon energy in the years and decades ahead, the UK needs an energy mix that is diverse, both in terms of technologies and geographical sources of imported fuels, within a market framework that offers competitive prices.’
- **Supporting consumers**
 - ‘We want to help you save money and save the environment by improving energy efficiency and addressing fuel poverty.’
- **A low-carbon UK**
 - ‘A key role at DECC is to help the UK move to a low-carbon economy.’

Source: DECC website 26 November 2010



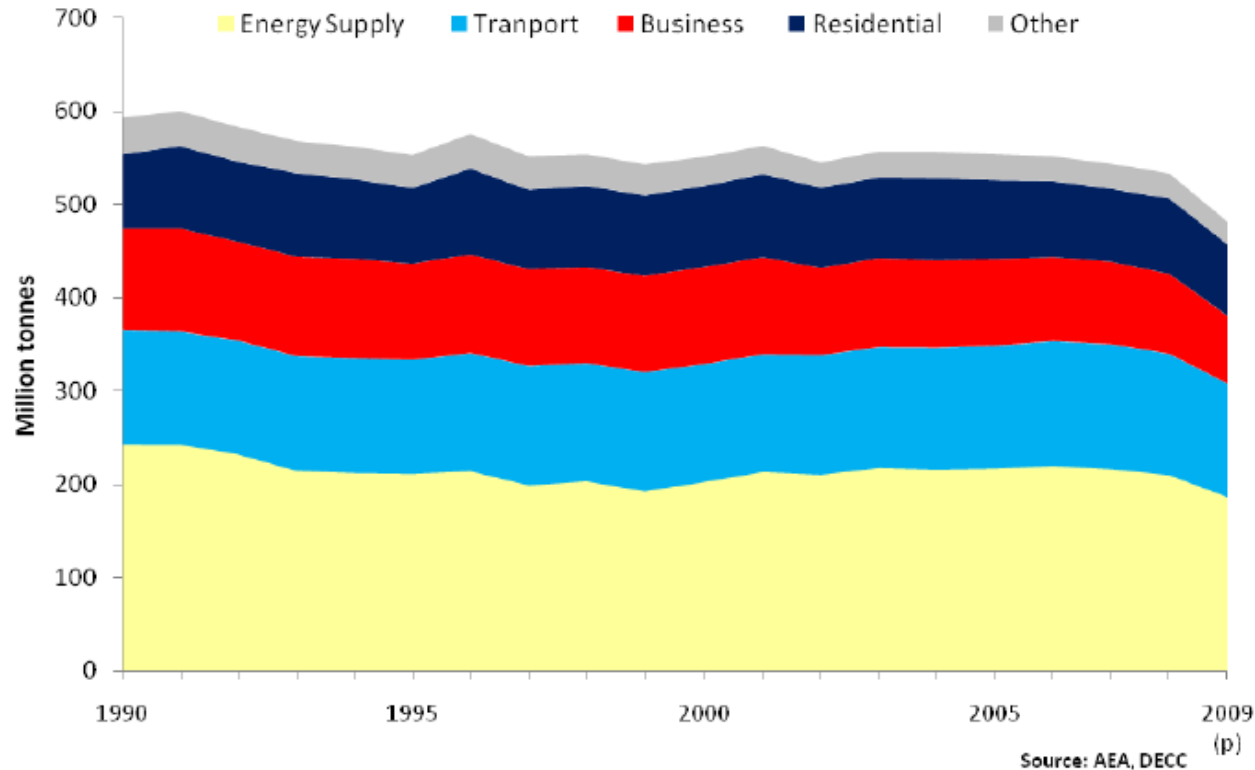
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The Coalition Agreement - DECC

- Includes:
- Support an increase in the EU emission reduction target to 30% by 2020.
- Public sector investment CCS technology for four coal-fired power stations.
- Establishment of a smart grid and roll out smart meters.
- Establishment of a full system of feed-in tariffs in electricity – as well as the maintenance of banded Renewables Obligation Certificates.
- Creation of a green investment bank.
- Establishment of an emissions performance standard (EPS) that will prevent coal-fired power stations being built unless they are equipped with sufficient CCS to meet the EPS.
- Introduction of a floor price for carbon, and make efforts to persuade the EU to move towards full auctioning of ETS permits.
- Through a ‘Green Deal’, encouragement of home energy efficiency paid for by savings from energy bills.
- Delivery of an offshore electricity grid in order to support the development of a new generation of offshore wind power.
- ‘Liberal Democrats have long opposed any new nuclear construction. Conservatives, by contrast, are committed to allowing the replacement of existing nuclear power stations provided that they are subject to the normal planning process for major projects (under a new National Planning Statement), and also provided that they receive no public subsidy.’

Carbon Policies in the UK

Figure 2: Carbon dioxide emissions by source, 1990-2009 (provisional)



CO₂ 1990 = 593 mt; 2009 = 481 mt; (-18.9%)

CO₂e: 1990 = 774 mt; 2009 = 575 mt; (-25.7%)

UK Government Targets = - 34% by 2020; - 80% by 2050.

Source: DECC



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UK Renewable Energy Targets

- UK committed to 15% target for renewables contribution to total final energy consumption in 2020 (2009/28/EC)
- Currently support regime only envisages 15.4% renewables in electricity by 2015-16.
- 2010 target of 10% for electricity from renewables (2001/77/EC)

Renewables Delivery - ROCs

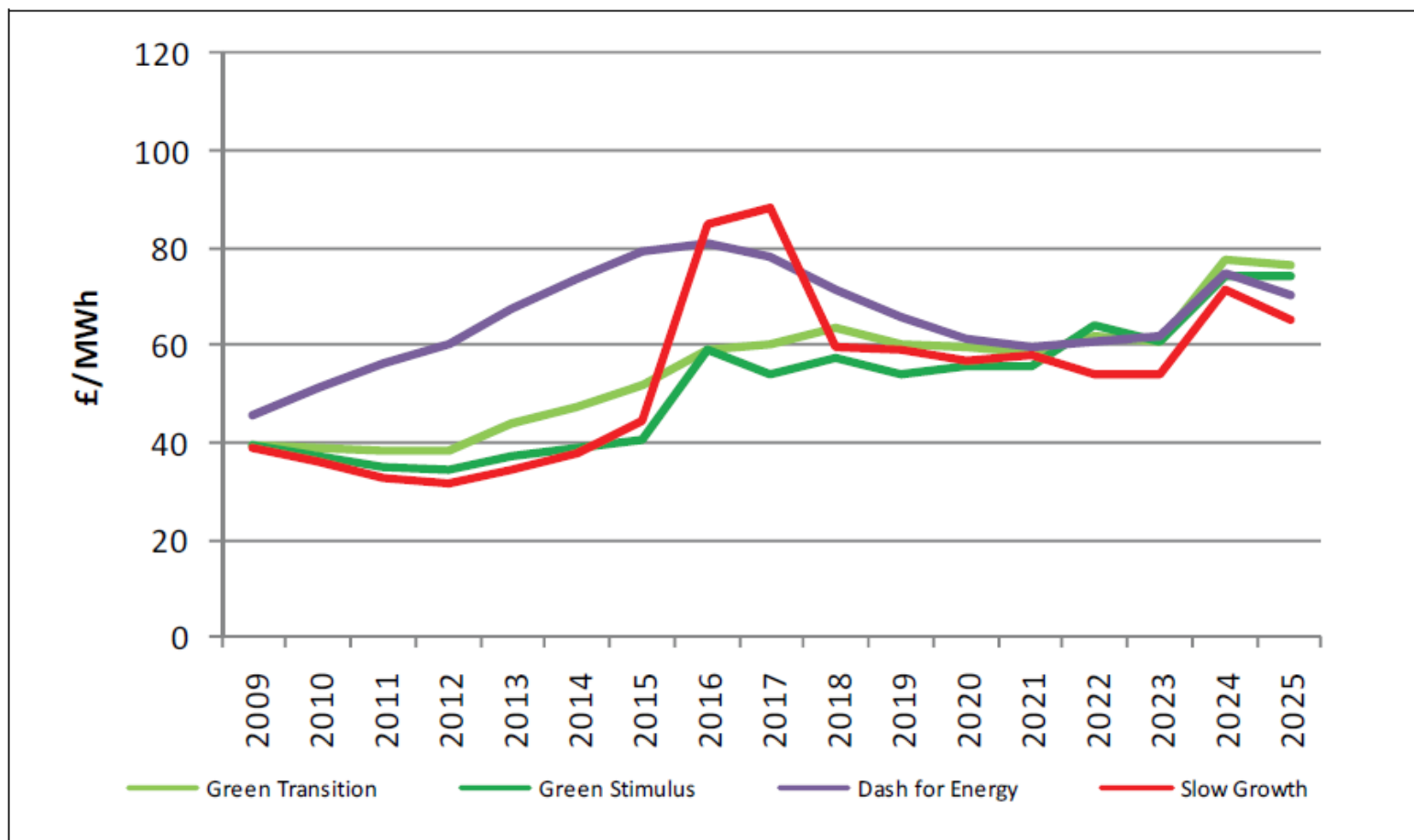
2009: 6.7% renewable electricity: target 9.7%.
Total Renewable Energy 2009: 3%.

	2005	2006	2007	2008	2009
Generation (GWh)					
Wind:					
Onshore (7)	2,501	3,574	4,491	5,792	7,564
Offshore (8)	403	651	783	1,305	1,740
Solar photovoltaics	8	11	14	17	20
Hydro:					
Small scale	444	478	534	568	598
Large scale (3)	4,478	4,115	4,554	4,600	4,664
Biomass:					
Landfill gas	4,290	4,424	4,677	4,757	4,952
Sewage sludge digestion	466r	447r	502r	547r	638
Municipal solid waste combustion (9)	964	1,083	1,177	1,226	1,511
Co-firing with fossil fuels	2,533	2,528	1,956	1,613	1,806
Animal Biomass (10)	468	434	555	587	620
Plant Biomass (11)	382	363	409	568	1,109
Total biomass	9,102r	9,279r	9,276r	9,298r	10,636
Total generation	16,936	18,108r	19,652r	21,580r	25,222
Non-biodegradable wastes (12)	578	651	707	736	874

Source: DUKES, 2010.

Electricity Price projections

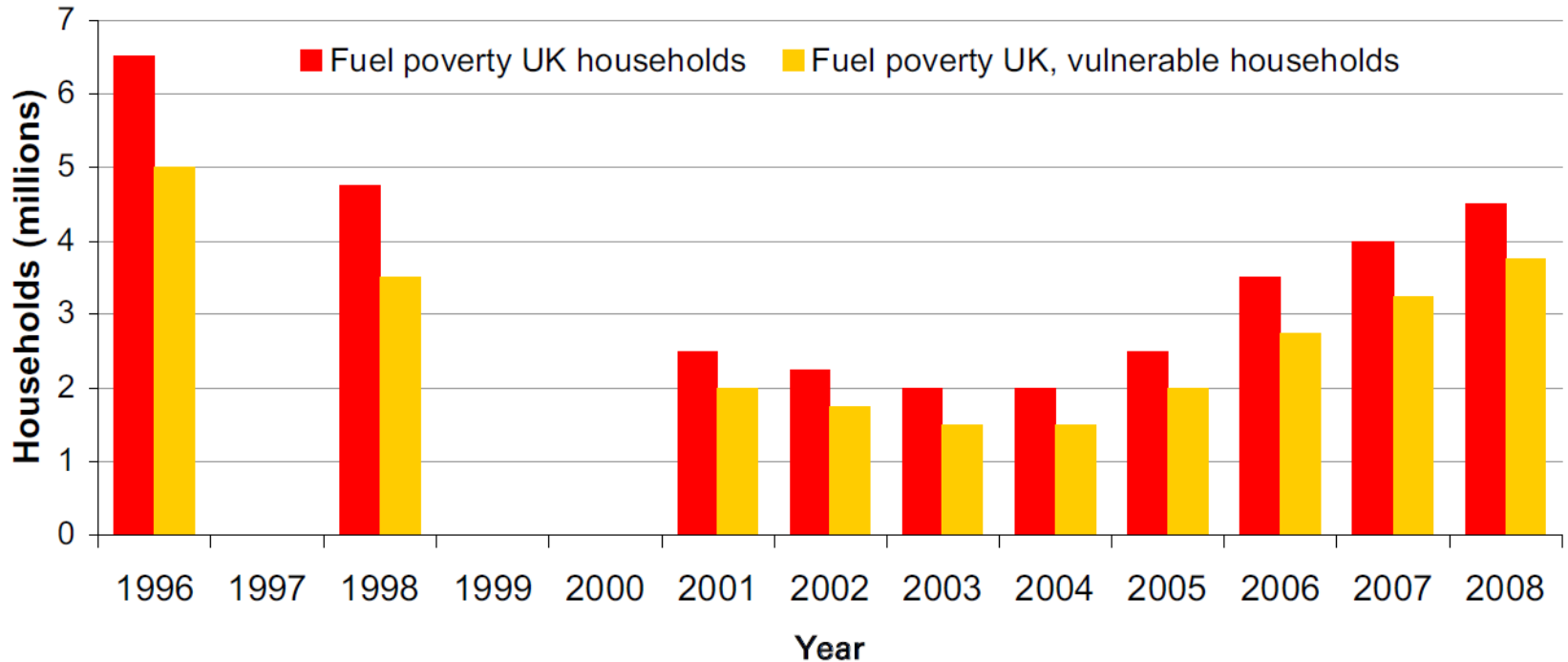
Figure 3.19: Wholesale electricity prices



Source: Ofgem, Project Discovery, October 09, p.51.

Fuel Poverty in the UK

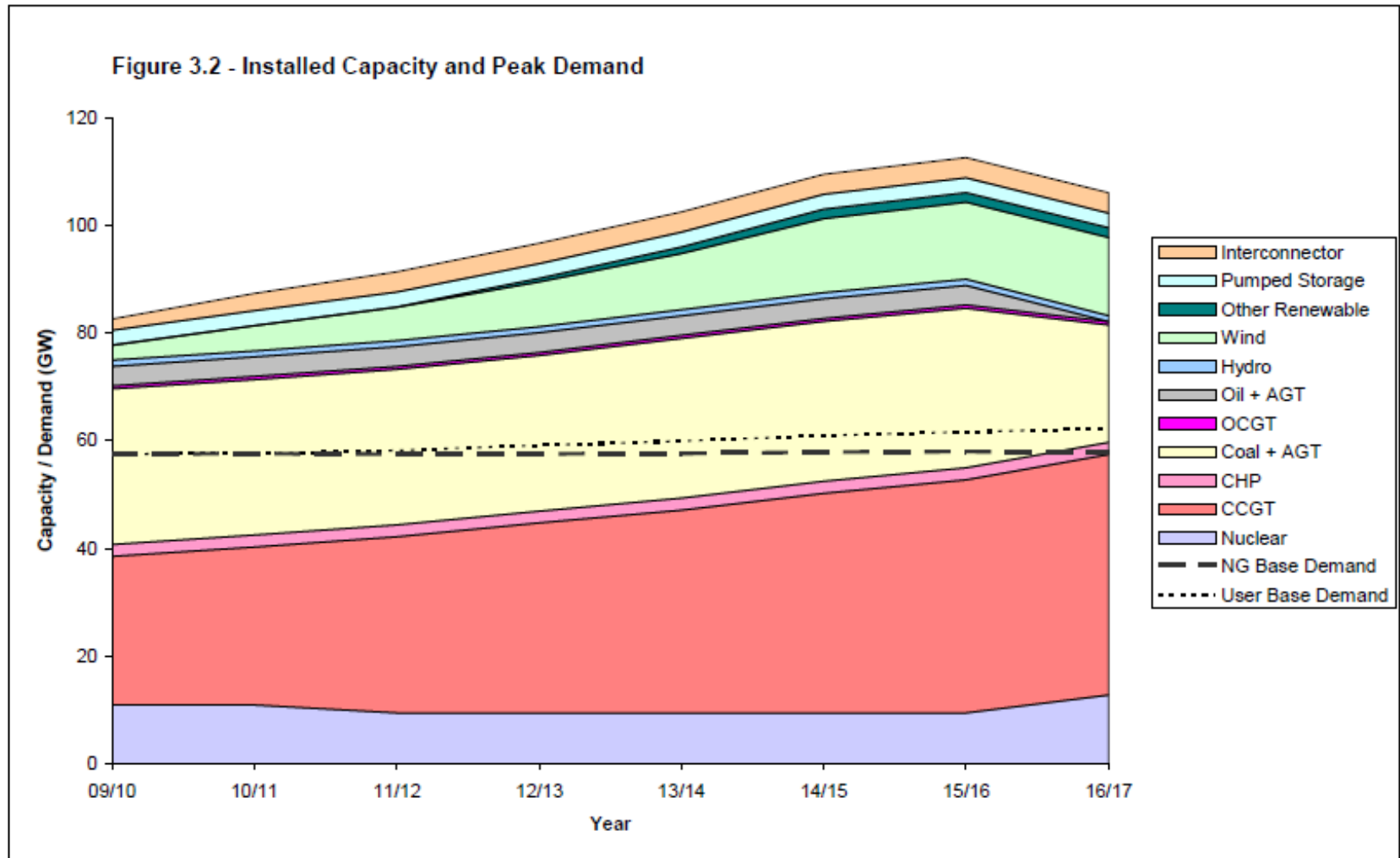
Chart 1 – Fuel poverty in the UK, all households and vulnerable, 2008⁴



18% of all households spending 10% or more of income on household energy in 2008.

Source: DECC, Annual Report on Fuel Poverty Statistics 2010.

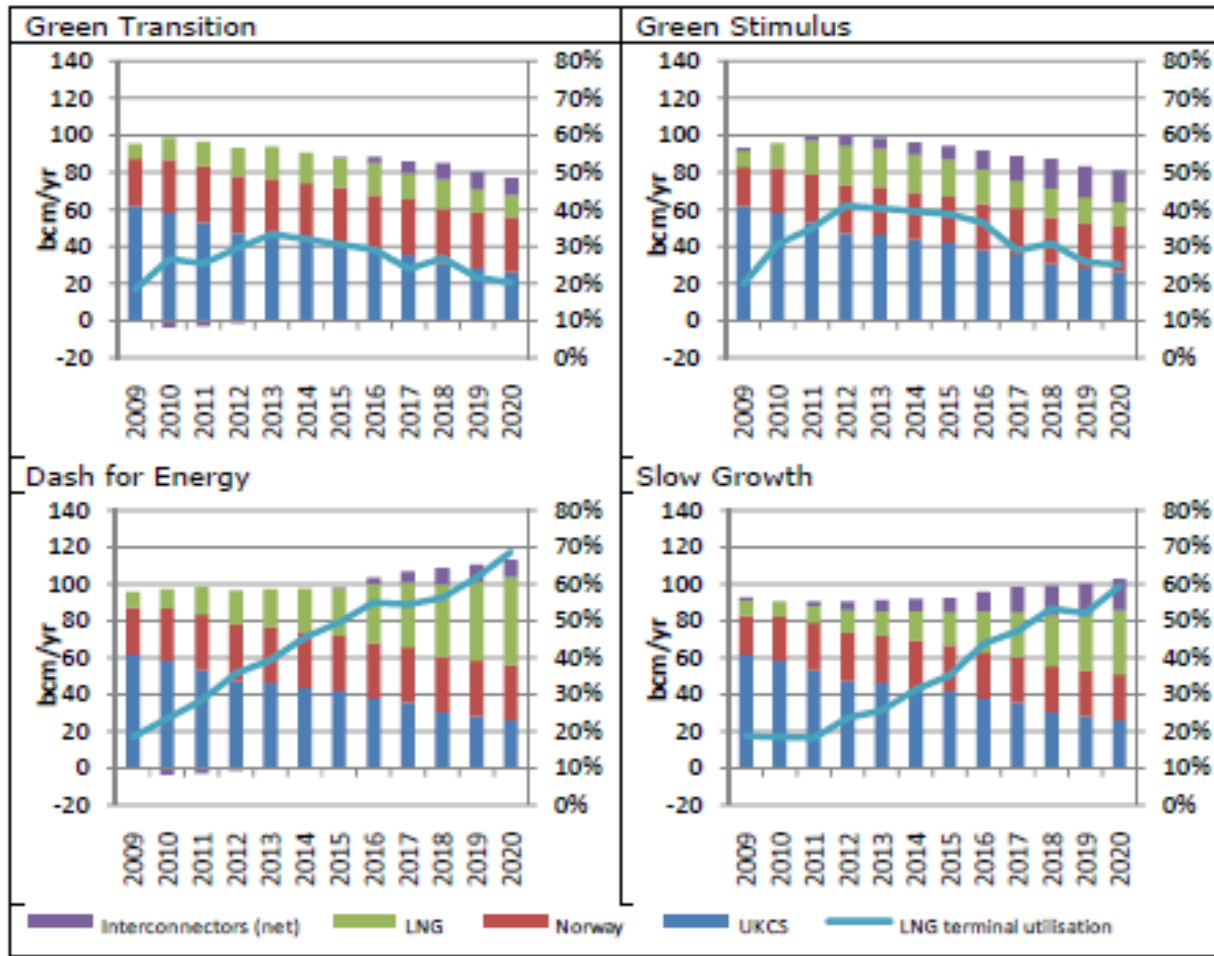
Energy Security - Electricity



Source: National Grid, 2010, Seven Year Statement, Ch 3, p.10.

Energy Security - Gas

Figure 3.4: Annual GB gas supplies and LNG regasification terminal utilisation



Source: Ofgem, Project Discovery, Oct 09, p.32.

Are markets working? (My emphasis)

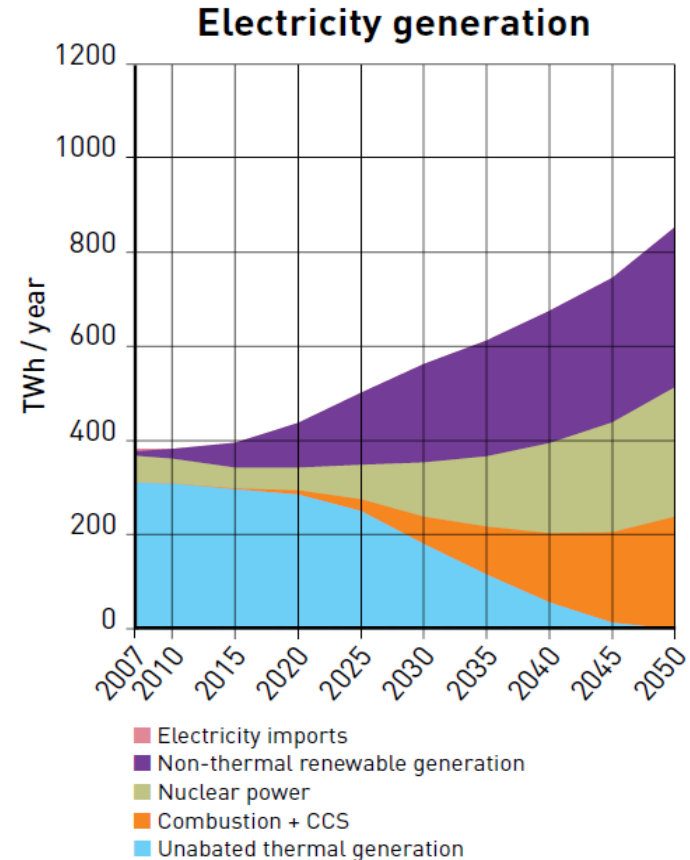
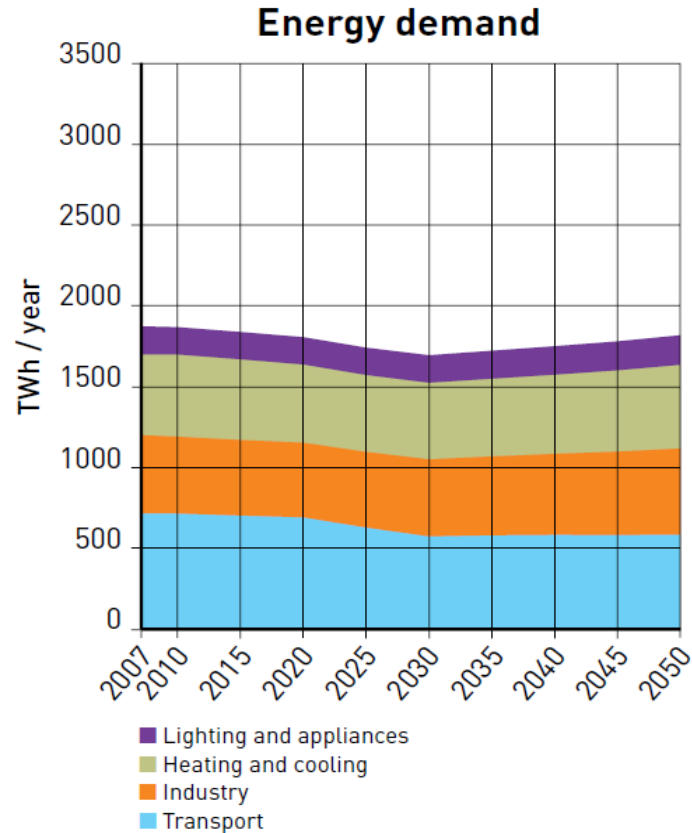
- *‘We must also consider the Electricity Market Reform (EMR) package, which is due to be published in the autumn. This is probably the most important issue we will address this parliament, because in the course of the next few years we have to re-invent our EMR. We have to put in place measures which will stimulate investment in a world which is increasingly uncertain.’*

Charles Hendry, Minister of Energy, Energy Focus, December 2010.

- *‘We are...looking for **solutions that make the GB energy markets more capable of attracting finance** over the medium to longer term, whilst at the same time being mindful to ensure that existing and on-going investments are not compromised.’*

Ofgem, Project Discovery Feb 2010, p.2.

The Government's View



Source: Hendry, Energy Focus, December 2010, p.4.

Economist's view

- Essentially government seems to be deciding the energy mix and working backwards to achieve it in a piecemeal way.
- What are the problems that the government is trying to address by intervention?
- Is the problem one of missing markets/incentives rather than, merely, market failure?

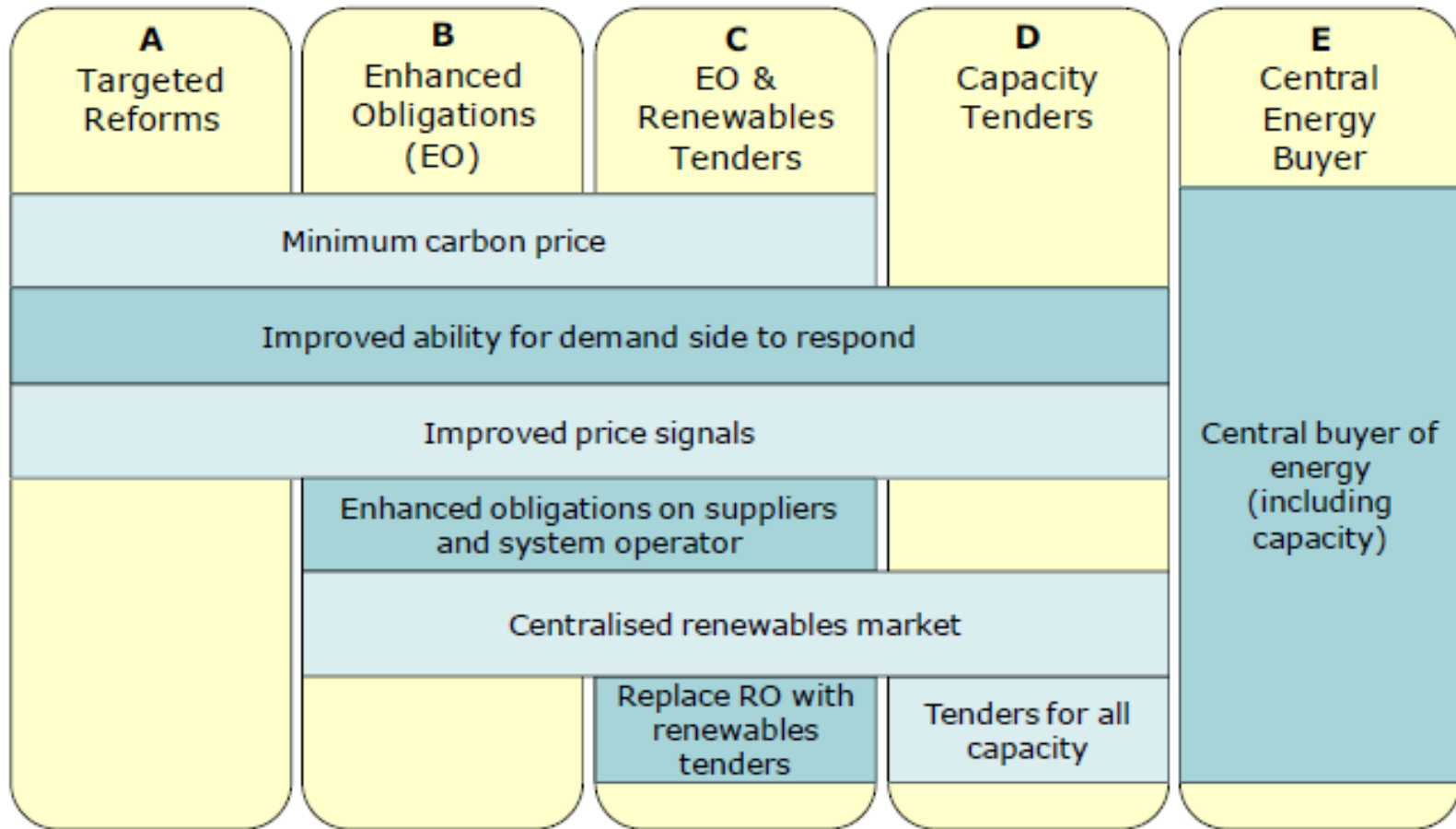
Project Discovery

Project Discovery - Concerns

- ‘There is a ***need for unprecedented levels of investment*** to be sustained over many years in difficult financial conditions and against a background of increased risk and uncertainty.
- The ***uncertainty in future carbon prices*** is likely to delay or deter investment in low carbon technology and lead to greater decarbonisation costs in the future.
- Short term price signals at times of system stress do not fully reflect the value that customers place on supply security which may mean that the ***incentives to make additional peak energy supplies available and to invest in peaking capacity are not strong enough.***
- Interdependence with ***international markets exposes GB to a range of additional risks*** that may undermine GB security of supply.
- The higher cost of gas and electricity may mean ***that increasing numbers of consumers are not able to afford adequate levels of energy*** to meet their requirements and that the competitiveness of industry and business is affected.’

Source: Ofgem, Project Discovery, Feb 10, p.2.

Project Discovery - Solutions



Source: Ofgem, 2010, Project Discovery, Feb, p.3.

Towards a Single Buyer?

- The cost of off-shore is huge
 - unsustainable in current conditions?
 - Precipitate move to long-term contracting?
 - Spot market too risky to support investment?
 - Balancing market works overtime with wind
- Any investment without a long-term contract?
 - But then need a Single Buyer?
 - With short-fall in spot market revenue via capacity payment charged through grid?

How long before a viable market design?

More complete markets?

- Nodal pricing plus central dispatch
- SO incentivised to balance
- Change ROC and FIT
 - Capacity payment for availability + energy payment if dispatched
 - Leave nodal spot prices to determine dispatch
 - Avoids negative wind bidding
 - FITs based on optimal subsidy path
- More merchant interconnection
- RD&D element financed from C-tax and/or full rate VAT on energy

Electricity Market Review

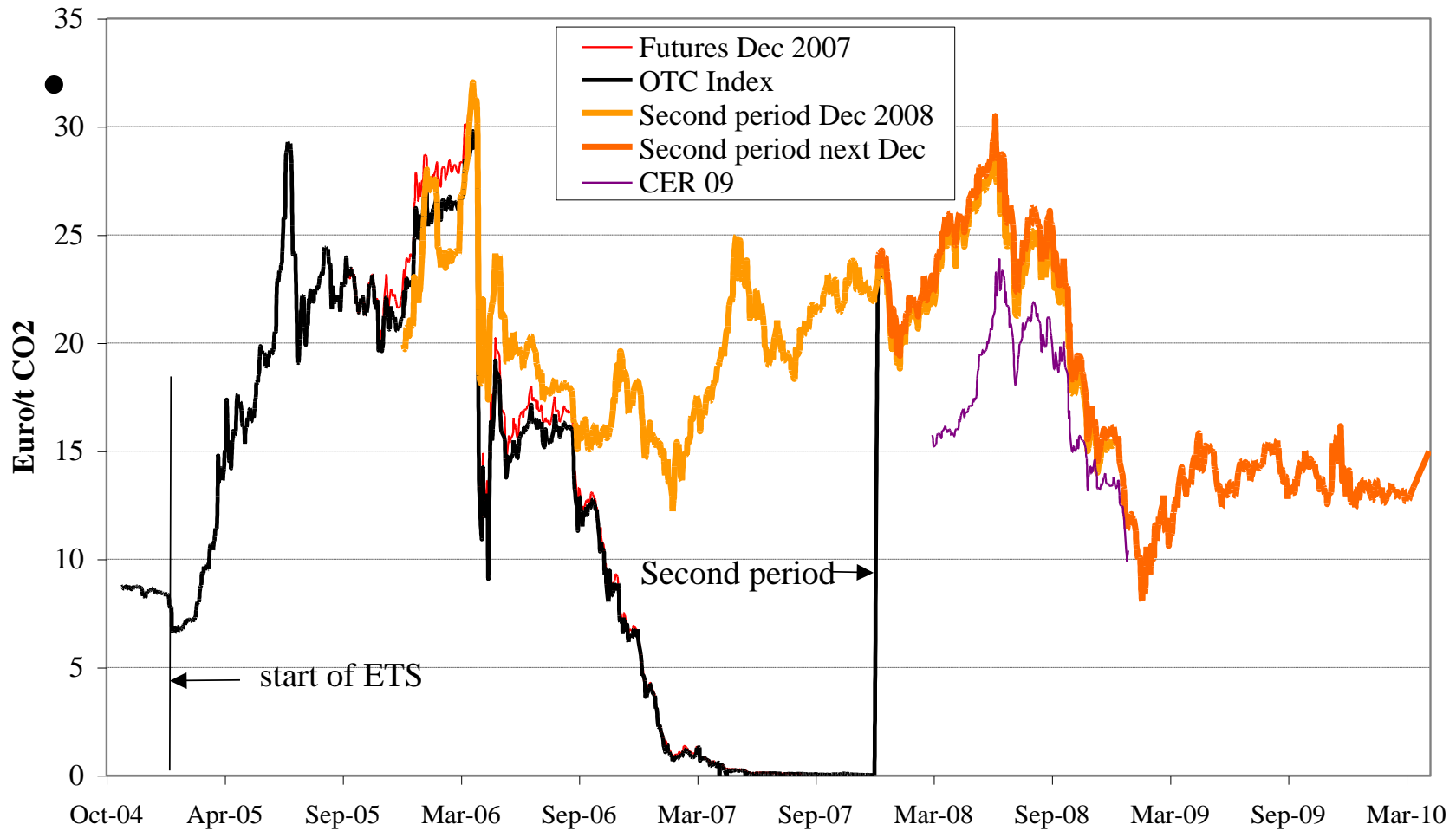
Electricity Market Review

- ‘Consult on electricity market reforms, potentially including the following proposals:
- a) Support for a carbon price to ensure that energy prices reflect their carbon content and encourage investment in low carbon generation
- b) A mechanism to reduce revenue uncertainty for low carbon generation e.g. by establishing a full system of Feed in Tariffs
- c) Introducing a new capacity mechanism, improving security of supply by incentivising or requiring sufficient capacity in the energy system
- d) An Emissions Performance Standard for fossil fuel power stations that will prevent new coal power stations being built unless equipped with CCS.’

Source: DECC Business Plan, November 2010.  UNIVERSITY OF CAMBRIDGE | Electricity Policy Research Group

Floor Price for Carbon?

EUA price October 2004-April 2010



Source: Newbery

FITs for all renewables?

- Not about jobs (only 38,000 in *German Wind*)
- There is a problem with planning
- What problem do FITs solve?
- Need to distinguish stage of maturity carefully:
 - Co-firing, landfill gas, waste left to carbon price
 - Emerging technologies (wave, tidal stream) need RD&D competitions
 - Offshore wind needs CFD type auctions (Ofgem, 06)
- RO mechanism clearly not delivering
 - Re-banding and re-cycling cover up problems
- Local ownership needed

Capacity Auctions?

- However what will be auctioned – capacity for security or low carbon CfDs?
- Must be technology neutral (whole point of free entry into generation).
- If capacity for security – all capacity must be able to bid (major lesson from US).
- If for low carbon need to worry about auction design and efficiency (demand side bidding would be sensible).
- Auctions for large scale renewables might be sensible.

Performance Standards

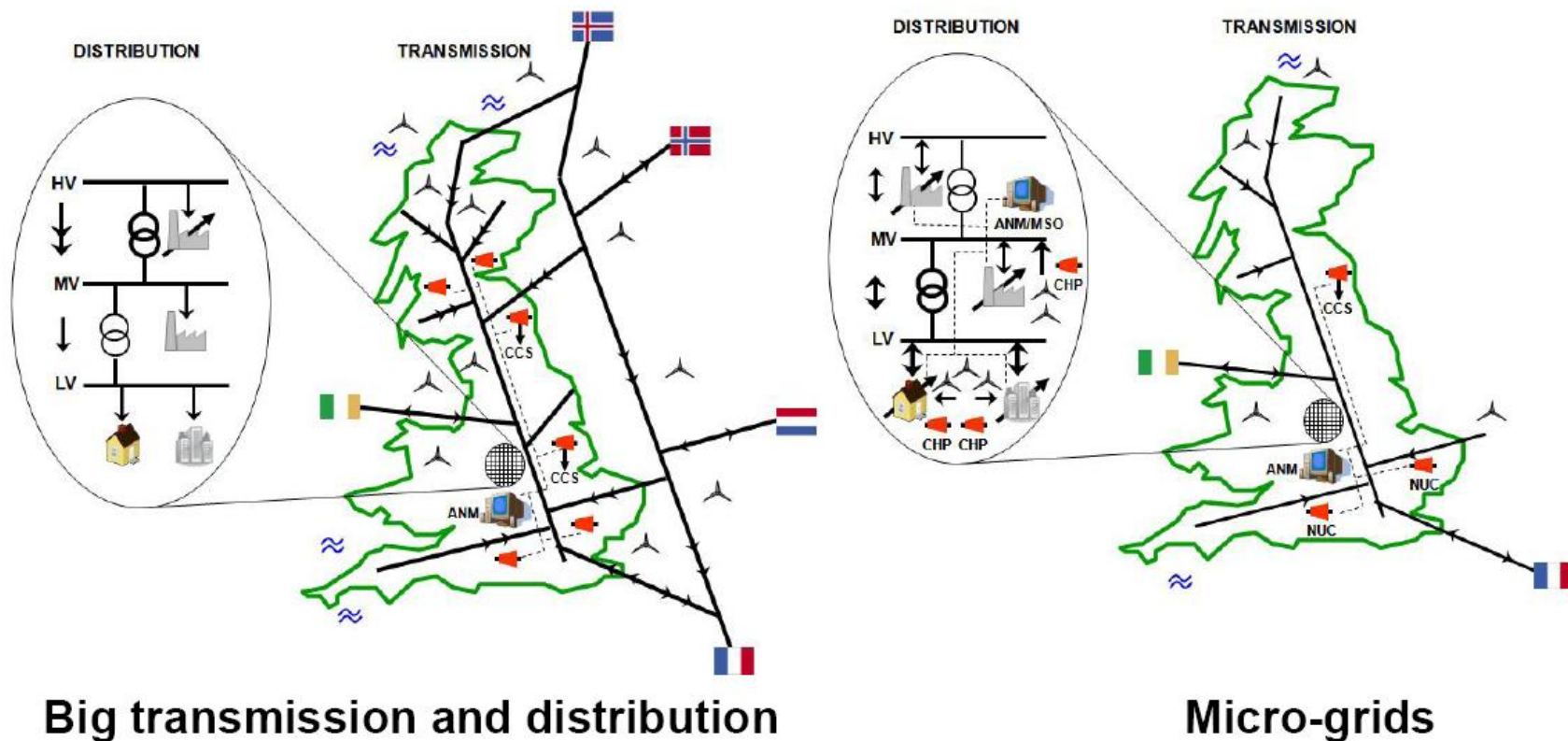
- Basically not a good idea when harm is global stock pollutant, which can be priced or permitted (vs a local pollutant).
- Market should find least cost solution taking into account the value of other factors, such as security, flexibility and demand response.
- The US did this in 1970s and 1980s and it was inefficient (see Joskow and Schmalensee, 1986).
- We want to incentivise the use of gas (and residual coal) where this is a cheap way of achieving flexibility.
- CCS vs gas is clearly about the carbon price and demonstration value of technology.
- Implementation looks problematic and likely will be on a case by case basis, causing uncertainty and reducing investment.

Basic Problems of Additionality

- Proving additional carbon reduction or increased energy security from any of these policies is difficult.
- They don't recognise the existence of cap and trade mechanism.
- They don't have much grounding in the theory of finance.
- They don't recognise unintended consequences.

RPI-X@20 and RII0

An uncertain future – LENS



See: Ault et al., 2008

RPI-X@20 - Context

- Changing circumstances (Pollitt,08a):
 - Investment needs rising (annualised):
 - Electricity distribution (+48%, 05-10 vs 00-05)
 - Electricity transmission (+79%, 00-05 vs 07-12)
 - Gas transmission (+23%, 02-05 vs 07-12)
 - Gas distribution (+30%, 02-07 vs 08-13)
 - Network tariffs driven by capex not opex
 - Network capex driven by subsidised renewables
- UK RPI-X@20 review areas: (Ofgem, 09a):
 - Customer Engagement
 - Sustainability
 - Scale and scope of innovation

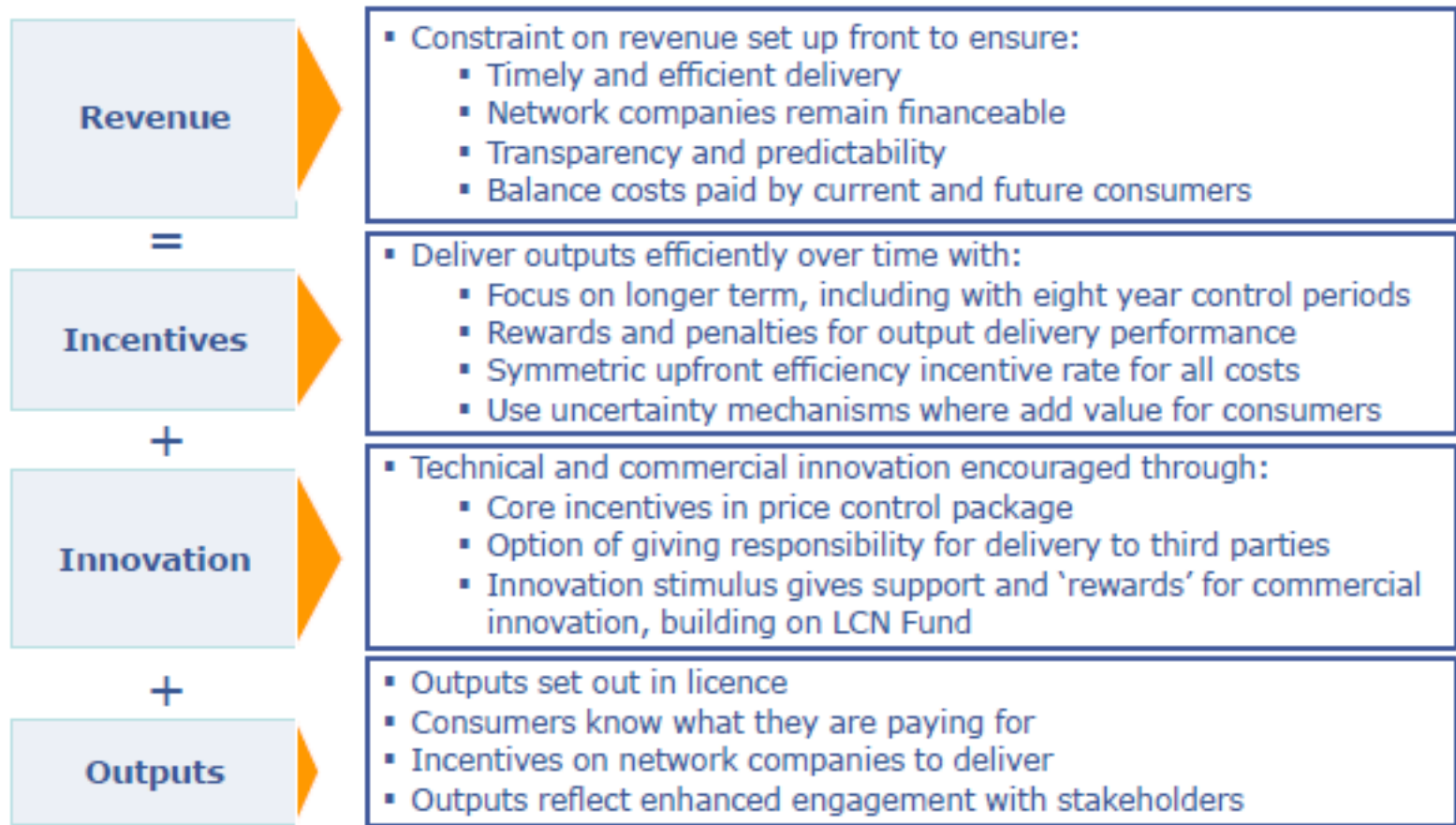
RIO vs RPI-X

- | | |
|--------------------------------------------|---------------------------------------------------------------------------------|
| ▪ Goodbye RPI-X | Hello RIO (R is revenue, I is incentive, I is innovation is for output.) |
| ▪ Goodbye 5 years | Hello 8 years |
| ▪ Goodbye Poor customer involvement | Hello Customer Engagement |
| ▪ Not Revolution but | Evolution – financial package gets worked through in real PCR's. |
| ▪ Commitment not to impair RCV | Enables financial package to get support and introduction. |
| ▪ Great link to Discovery | We are assisting in £40bn spend. |

Source: Ofgem City Briefing, July 2010, p.13.

RIO – Elements

RIO: A new approach to regulation



Source: Ofgem City Briefing, July 2010, p.28.



Key elements and questions

- Longer, potentially lighter price control
 - Incentive properties ambiguous?
- Enhanced consumer engagement
 - Did this go far enough?
- Wider definition of outputs
 - How will these be determined?
- Enhanced innovation funding and incentives
 - More competition/entry needed?
- Enhanced competition in delivery
 - Role of tendering in lower costs?

Towards a sensible set of Energy Policies

Elements of Future EU/UK Policy: 1

- Policy towards natural gas (Findlater and Noel, 2010)
 - Gas improves security (especially in short run), affordability and decarbonisation
 - A single European gas market improves all three
- Unbundling (Nillesen and Pollitt, 08; Pollitt, 08b)
 - Case for D/S splitting
 - Case for ISO/ITOs
- Ownership (Pollitt, 10a; Kelly and Pollitt, 10; Haney and Pollitt, 10)
 - Role for PPP and mixed ownership
 - Role for financial / mutual / cooperative / community SPVs
 - Role for local authorities /local entrepreneurship /prosumers

Elements of Future EU/UK Policy: 2

- Competition on supply side (e.g. Parail, 10)
 - Competition enforcement action by Commission and nation regulators significant
 - Stricter policy on mergers
 - Extension to networks especially for offshore and interconnectors
- Competition on demand side (e.g. Platchkov and Pollitt, 10)
 - Smart metering and technologies an opportunity
 - Extends and completes competitive market
 - Integration of power/heat/transport in prospect
- Regulation (Ofgem, 2010b; Pollitt and Bialek, 08)
 - Sustainable network regulation
 - Nodal pricing in T, and D?

Elements of Future EU/UK Policy: 3

- Renewables (see Pollitt, 10b, Lange, 10)
 - Renewables directive not credible
 - Interferes with both EUETS and energy markets and must be made compatible with both
 - Are currently disgraceful con trick as climate policy
 - Need optimal subsidies for renewables
- Role of EU Commission (see Pollitt, 09)
 - Very important so far
 - Needs to sort out competing directives and focus on competitiveness and carbon
 - 4th Energy Package?

A sensible EU/UK electricity policy?

(See Noel and Pollitt, 10)

- High & stable (or credibly rising) carbon prices
- A learning benefit-based renewables policy
- A fact-based electricity security policy
- Better public engagement on costs of policy
- Reliance on market mechanisms



Comments on Energy Policy

- The size of *the current energy ‘policy mess’ is substantial* in the UK and at the EU level.
- The *EU Single Market Project is a great one* – it still applies to the electricity market and is key to progress.
- In electricity *the project has been high-jacked by investment interests* in renewables and energy security.
- Only policies with *clear theoretical/empirical support and overall consistency* are worthy of EU-wide agreement.
- The market discovery process (accompanied by anti-monopoly policies) [as opposed to the Project Discovery process!] is the only one capable of delivering decarbonisation of electricity with efficient costs and prices.

Specific comment on the UK

- **The UK is not prepared to make the costs of its ambitious targets clear by having its own carbon price or tax.**
- Yet more special arrangements may deliver the odd investment, but given the fundamental problem they won't add up to a coherent or least cost policy, *which works.*

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