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The implications of the UK's Electricity Market Reform for the consumer

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IAEE Annual Conference, Stockholm
21 June 2011

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

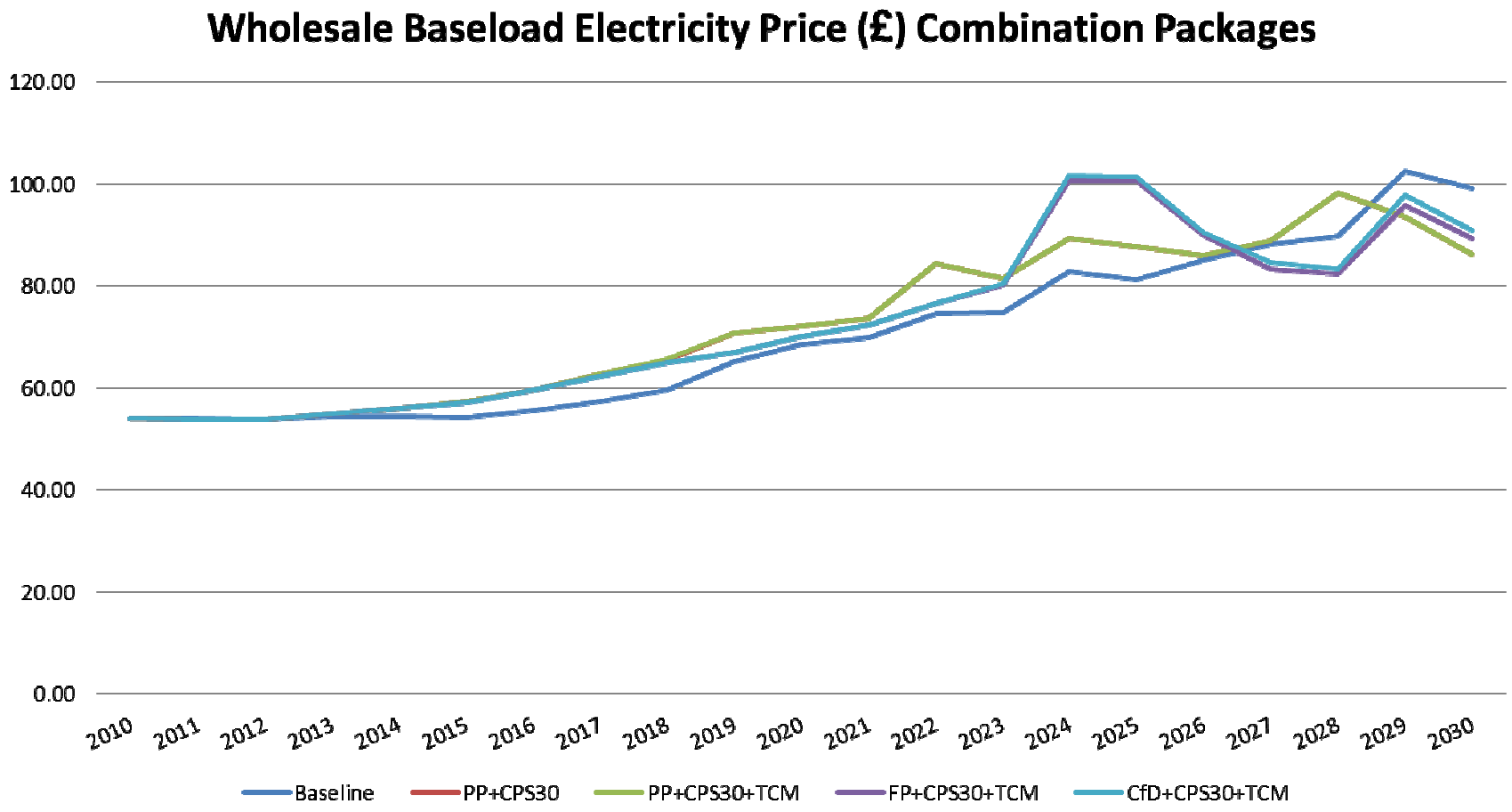
1. HOUSEHOLDS BILLS

Household Bills

- DECC assume reduced household consumption from 2010 to 2030 (10% decrease)
  - This is the direct result of current and planned government policies. No second round demand side reduction effect.

- The Consumer bill goes up, but not as much as the wholesale prices
  - Wholesale baseload electricity prices increase by 69% from 2010 to 2020 under the preferred package.
  - Residential Consumer Electricity Bill increases 33% by 2030 under prefered package.
  - Bill is 1% higher than in Baseline in 2020, but 7% lower in 2030.
  - However, baseline assumes ambitious adjustments in RO bands to meet Renewable Obligations...
  - Using Ofgem assumptions for T&D costs residential bills rise 50% or 67% per unit by 2030.

Household Bills



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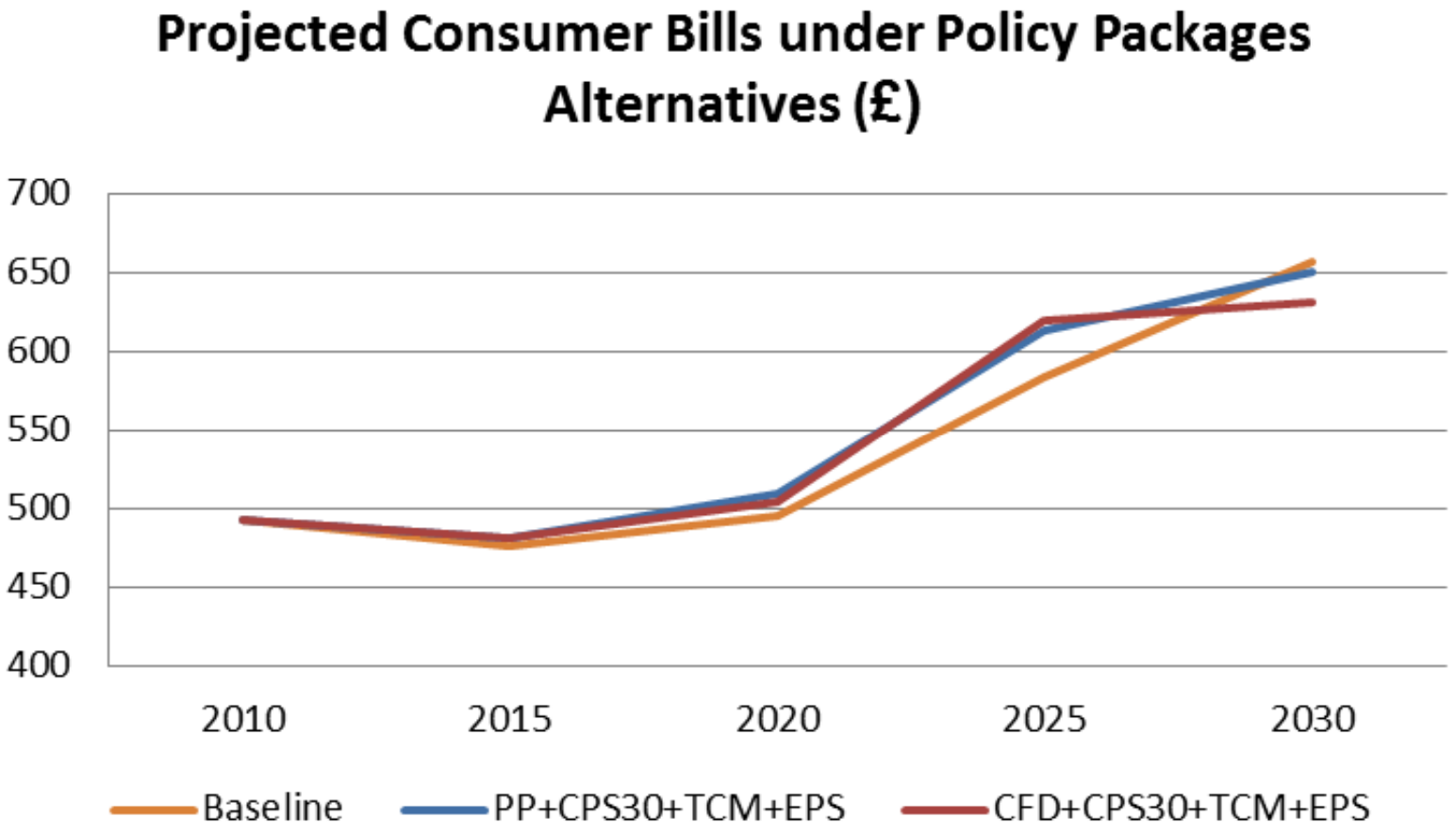
Household Bills



What Consumers Will Get...

- Lead Package (CFD+CPS30 +EPS+TCM)

  a. Welfare Impact
  b. Distributional Analysis
  c. Indirect Impact
  d. Renewables
  e. Decarbonisation
  f. Energy Security
  g. Cost of Capital and Risk

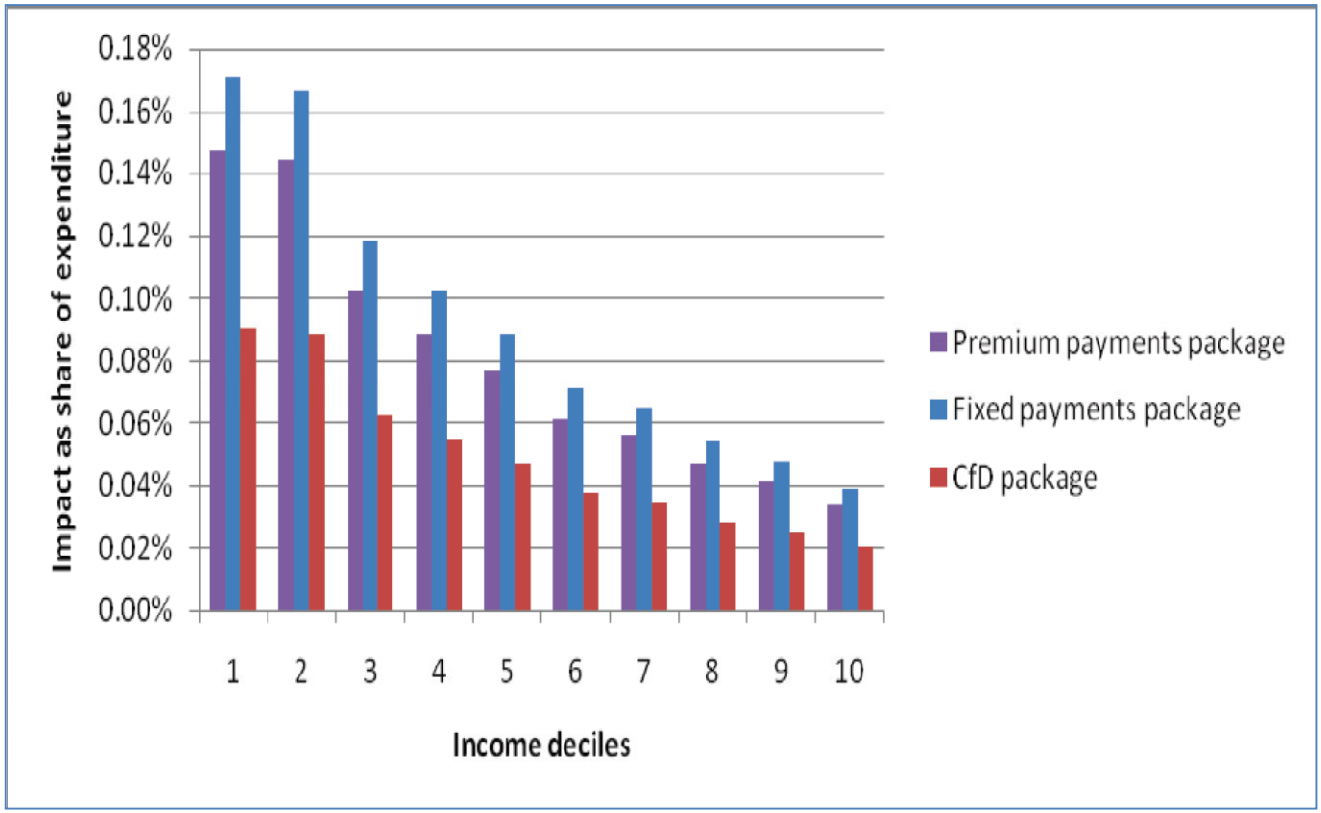
What Consumers Will Get...

a. Welfare Impact on Domestic Consumers (negative NPV)

- Welfare loss under CENTRAL case £3,092 million in real 2009 prices
  - » NPV £122, or annuity of £9 for 20 years per HH
- Welfare loss under HIGH DEMAND case £10,264 million in real 2009 prices
  - » NPV £407, or annuity of £29 for 20 years per HH
- But...
  - This is compared to Baseline. Compared to business as usual – loss will be higher
  - No sensitivity analysis for low demand, or high and low fossil fuel and carbon prices. **Redpoint Analysis for ENA assumes lower gas prices in 3 out of 4 scenarios...**

What Consumers Will Get...

b. Distributional Analysis (Consumers of the Lowest Income Decile Hit the Hardest)



This is relative to baseline in 2020.

Actual impact several times this.

What Consumers Will Get...

c. Indirect Impact (Not considered in EMR)
   - Spent Income Impact (Direct and Indirect price impact)
   - Factor Income Impact (Final GE effect)

d. Renewables (More renewables)
   - Achieve more renewables than business as usual (BAU)
   - According to 7 year plan of National Grid (BAU), between 20% and 25% of renewable generation by 2020

e. Decarbonisation (Yes, in the UK, but not Globally)
   - Under EU ETS, lower emissions in UK→ more permits to be used in rest of EU → higher emissions in rest of EU
   - Undermining EU ETS – endangering future coordinated action

What Consumers Will Get...

f. Energy Security (Yes, but negative NPV)

– Energy Security is not currently an issue in the UK

– It will become more of an issue when renewables constitute larger share of generation

– Still, NPV of the preferred package is negative, compared to the same package without Capacity tender.

What Consumers Will Get...

g. Cost of Capital and Risk (Risk shifted to consumers, cost of capital decreases, brings more nuclear)

- Key EMR objective is reducing cost of capital by reducing investor uncertainty (reduced hurdle rates)
- But in reality Risk does not disappear (shifted to consumers)
- Consumers insured from higher gas prices by higher share of renewables, but can not taker advantage of lower gas prices.
  - Redpoint Analysis of ENA (2010)– low gas prices considered in three out of four credible scenarios: “There are credible and robust scenarios in which gas could play a major role in the GB energy mix”...
- Highest reduction in the hurdle rates is for the Nuclear
  - Hurdle rate decreases by 2%, worth around £1.5bn on 9.6GW of nuclear investment)
  - First Nuclear New Build will appear in 2019 in the preferred package, versus 2027 in baseline.

2. RISKS & UNINTENDED CONSEQUENCES

Potential risks

- **Complexity, redundancy, uncertainty & timing**
  - Ex.: EPS (redundant & superfluous) & TCM (unnecessary at this stage/premature action is costly) (UKERC, 2010)
  - Investors want transparency, longevity and certainty (Deutsche Bank, 2009)
  - Risks for investors' confidence; potential barrier for new entry
  - Risks of "stacking on" multiple instruments imposes additional tangible and less tangible costs (Fankhauser et al. 2011)

- **Importance of non-cost barriers:**
  - Ex. planning issues, consumers' support, grid access & charging, capacity & supply chain, T&D (ECORYS, 2008; IEA, 2008; Pollitt, 2010).
  - Risks due to lack of attention to local planning problems, constraints and societal preferences
  - Striking recent examples:
    - recent UK renewable support policies (e.g. 195 projects in GB "queue")
    - T&D & connection costs for wind generation in Germany

Potential Risks

- **Specific technology risks:**
  - Economics of certain technologies are uncertain – e.g. MIT 2009 study on nuclear costs has doubled its estimates compared to 2003 study
  - Recent escalating costs due to higher commodity prices
  - One of the most illustrative case is nuclear power, where history clearly shows that estimated costs are less than outturn costs:
    - E.g. Olkiluoto in Finland:
      - reported contract price in 2004 was 3 billion of Euros. Today it is estimated at 5 billion.
      - 3 years of delays (today)
      - Design of the deal in fact makes consumers' bear the risk (Schneider et al. 2009)
    - E.g. Flamanville in France:
      - Cost estimated at 3.3 billion Euros in 2006, 4 billion in 2008, 4.5 billion in 2009

3. ALTERNATIVE POLICIES?

Alternative policies I

- UK specific context: liberalised markets, building stock, EU ETS, environmental targets/agenda

Example of alternative policies – demand side:

- *Demand-side management:*
  - Cheapest and most direct technologies focus on demand reduction (Pollitt, 2010)
  - Much potential for reduction from buildings (CCC, 2008)
  - Economic savings, hence deployment of capital in this area should be incentivized (Deutsche Bank, 2009)

- *Creating consumer markets for green energy:*
  - Importance of engaging consumers (MacNamara and Grubb, 2011); consumers become « pro-sumers » (Devine-Wright and Devine-Wright, 2004)
  - Harnessing willingness to pay for green electricity: e.g. green tariffs; long-term, zero carbon contract between consumers and suppliers (Laing and Grubb, 2010)
  - Reducing the costs of capital: e.g. electricity-index bonds to consumers (Newbery, 2010)

Alternative policies II

Alternatives – supply side & governmental action

- *R&D support:*
  - Cost-effectiveness of low-carbon transition depends on innovation, driven by R&D
  - R&D in electricity typically low, there is need for a framework to enhance R&D and support technological progress (Jamasb and Pollitt, 2010)
  - Focus on R&D and innovation is more cost-effective than strategic market roll-out of specific renewables technologies; could by funded by carbon tax and/or full VAT on energy – full VAT could raise £3 billions per year (Newbery, 2010)

- *Other routes to carbon price certainty:*

  Certainty, longevity and flexibility is needed possible mechanisms that help smooth prices and hence, reduce costs (Fankhauser and Hepburn, 2010) :

  1) longer-time commitment
  2) banking and borrowing across commitment period
  3) "cap and floor" schemes: e.g. setting reserve prices, "allowance reserve", or rigid ceilings and floor

Alternative policies III

Alternatives – supply side & governmental action

- *Refocus action at the EU level – 2 avenues:*
  - EU ETS:
    - Tightening of EU ETS quotas (OECD, 2011)
    - Minimum reserve price
    - Automatic adjustment of EU ETS according to actual renewable delivery
  - International tradable green certificate (TGC) (Meyer, 2003); some legal basis ("cooperation mechanisms") in RES Directive; empirical evidence: ex. RECS

- *Fiscal measures:*
  - Supports costs for RES estimated £5.2-7.8bn per year by 2020, i.e. £60-90 per households (SKM, 2008). Newbery (2010) estimated:
    - Co2 tax of £/tonne = £2.75 bn per year, (based on current levels)
    - Similar tax on final gas = £1.5 bn per year
    - Full VAT = £3 bn per year

    } **= £7.3bn per year!**

  - Everybody is worse off compared to non-tax scenario, BUT: ***carbon price increase brings revenues that can be recycled & redistributed (compensation mechanisms)***
  - ***Treasury should take a much greater role in reforming energy and carbon pricing***

4. DISCUSSION & CONCLUSIONS

Conclusion - EMR

The analysis raises serious questions about EMR proposals as regards:

1) Policy objectives:

- A substantial part of it related to expensive RES policies
- Significant surplus transfer from consumers & government to market players
- Short term impact on net carbon emissions would be zero, given the EU ETS

2) Policy design:

- EMR shifts responsibility from market to government for energy security
- EMR is optimal tax policy AND optimal energy policy

3) Policy consistency:

- UK energy policies criticised for complexity and inconsistency (OECD, 2011)
- Risk analysis underplays scope for policy failure

- **Much more attention of EMR effect on real incomes**
- **Risks seem to be increased for households**
- **Green Deal and RHI open avenue for including heat as part of wider energy policies – however this should not mask what is happening under EMR.**

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