Strengths and weaknesses of the British Electricity market model

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FSR-IAEE online seminar

11th October 2021
Key events in GB electricity

• Privatization: private owners more efficient than public
  – but private cost of capital roughly double public sector
  => payback period half, 10 years without guarantees
  – early generation investment backed by 15-yr PPAs
  – network regulated under RPI-X, then RIIO

• 1989: spare capacity, CCGTs cheap, coal costly
  – pool: central dispatch with capacity payments
  – ideal for competitive bidding but privatized as fossil duopoly
  => “dash for gas”, overcapacity => competition

• NETA (2001) replaced pool with energy-only market
  – failed to deliver needed investment
  – renewables support failed to deliver

=> 2011 Energy Market Reform
The gradual emergence of a competitive industry

Offer encourages sale of 6,000 MW

PG & NP trade horizontal for vertical integration

Source: NGC Seven Year Statements, various years, and data from J Bower and C Humphries, slide from D Newbery

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NETA: Profit margins fell, fuel and power prices more volatile
Why EMR?

• ETS offers *inadequate low-C investment signal*
• RES not on target
• Generation investment crunch but *no investment*

*Consensus that market not delivering objectives*

=> capacity payments auctioned

• HMT sets Carbon Price Floor in 2011 for 2014
• de-risk **RES investment** => Contracts to lower WACC
  – Originally bureaucratically set, then auctioned
ETS and GB CO2 prices, 2011-18
EU renewable generation added since 2006

Cumulative increment in RES-E since 2006 top 12 MSs

- GB accelerates after EMR

Countries in order shown above

TWh


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RPI-X improved operating efficiency successfully delivered network investment but hard to benchmark
   => replaced by Revenue = Incentives + Innovation + Outputs (RIIO)
Network innovation competitions very successful
Reforming network tariffs less so with capacity auctions unseemly entry on small diesel generators on distribution networks
GB: rich evidence of **what works** and **what not**

- renewables support now good, could be improved
- very durable investment **needs contractual support**
- nuclear & CCS inching towards RAB finance

**Regulation:** **good at investment assurance**

- leading on **innovation support**
- less good at agile tariff adjustment

*moving to better balance of competition in and for market, auctions and RAB finance*
Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>CCGT</td>
<td>combined cycle gas turbine</td>
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<tr>
<td>CCS</td>
<td>carbon capture and storage</td>
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<tr>
<td>CfD</td>
<td>Contract for Difference</td>
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<tr>
<td>EMR</td>
<td>Electricity Market Reform =&gt; <em>Energy Act 2013</em></td>
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<tr>
<td>NETA</td>
<td>New Electricity Trading Arrangements</td>
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<tr>
<td>PPA</td>
<td>Power purchase agreement</td>
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<td>RAB</td>
<td>Regulatory asset base (on which investors earn return + depreciation)</td>
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<tr>
<td>RES</td>
<td>Renewable energy/electricity supply</td>
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<tr>
<td>RIIO</td>
<td>Revenue = Incentives + Innovation + Outputs</td>
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<tr>
<td>RPI-X</td>
<td>revenue indexed to retail price index less efficiency factor (X)</td>
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<td>WACC</td>
<td>weighted average cost of capital</td>
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