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Electricity market unbundling and reform

Discussion document

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Unbundling energy markets remains a key challenge of governments around the world

Vertically integrated utilities (common generation, transmission, distribution, supply) can be unbundled to introduce competition in the wholesale market (generation) and, less often, retail markets (supply).

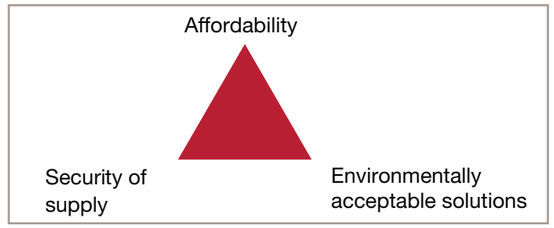
Competition from a vertically integrated position is often introduced by way of a Single Buyer model to encourage competition entry opportunities for Independent Power Producers (IPPs).

Further competitive market arrangements can be organised through more complete wholesale and retail market electricity, trading arrangements. Two examples are Pools and Bilateral Contact Markets with Imbalance Markets, of which there are hybrid variations.

The roadmap to reform can take many paths and has many possible end points

There are three main reasons for differences between countries and markets in the development of unbundling:

- Need to recognise constraints on the 'freedom' to be allowed for generation in their market behaviour (eg bidding into pools) and the level of 'atomistic' competition... consistent in ensuring best merit order despatch outcomes for wholesale price formation.
  - In small systems or systems with different types of generation in the hands of different generators, Single Buyer Models or constrained cost-based Pool models are more effective and reliable than Bilateral Contract Markets (with Imbalance Markets). The contractual arrangements in the first instance (eg the separation of energy and availability payments) constrain and control the practice of market power by the generator; during the term of the Power Purchase Agreement (PPA) or the application of the Pool market rules to the generator.
- Appetite for change and potential benefits of reform; how poor in historic performance and what size this prize from reform?
  - One key driver is often the attraction of economies of scale, for system and markets operators to move this ambit and geographic scope of merit order despatch from a wider portfolio of generation to reduce the costs of generation of operation security. In US, this lay behind the formation of PJM Interconnection Pool. In Great Britain, this lay behind the merger of England and Wales and Scottish markets under Great Britain System Operator arrangements. In EU generally, this explains the drive toward 'market coupling'.
  - The second big driver is the belief in the dynamic economic advantages of introducing competition in the upstream and downstream components of the electricity value chain to promote competition in choice of generation technology/fuels to introduce into the system and give consumers (especially large consumers), choice.
  - Third big driver is primarily about how much time and cost are needed to get to the chosen end point. Given the starting point, the capacity/ability of market participants to make change effective and how much time there is (e.g. between elections) to ensure workable and valuable end solutions can be achieved. This is important because market reforms need to be thought through and solutions 'designed 'so that unintended adverse consequences are avoided. The Californian market failure is an example of this as are the collapses of British Energy in the UK and the failures of Nordic Supply Businesses in the NordPool price spike crisis.
- There are genuine differences in what is right for different economies at different points of time; not just because of the two points above, but also because countries and economies are differently endowed with natural resources, have differing degrees of interconnectivity and trading opportunities with neighbours and are prepared to adopt and reach different balances in solutions to the compromises between the three main objective for electricity market, as show in the 'trilemma' below.



Moreover, the right solutions are themselves not necessarily final. Markets are dynamic.

So what are the secrets to success of electricity market reform processes?

The first and probably most important is to clearly articulate the strategy and objectives/rationale for change and to then engage with stakeholders. Then, to identify and analyse the benefits and ensure that the positive elements of existing processes are maintained. Four pillars are:

1. The principle of merit over despatch;
2. Rules to retain operational security (reserve planning for emergency loss of generation);
3. Retained customer service obligations (frequency and voltage stability, minimum times for re-energisation after blackouts, duties to connect, etc); and
4. Appropriate pricing for and management of environmental impacts.

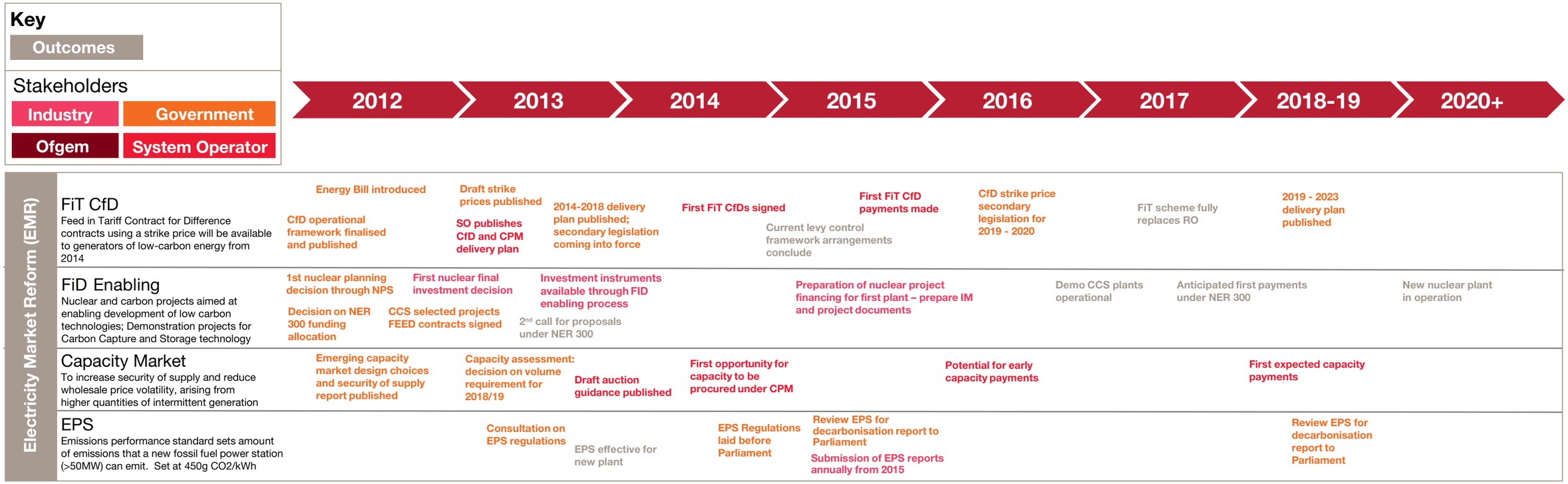
Benefits realisation planning includes establishing targets and timescales within which benefits can be realised (e.g. new National Grid organisation, retails market opening, wholesale market organisation plans, new transmission interconnections).

Integrated Planning involves recognising inter-dependencies between projects and programmes during the transition from as is to new reformed industry structures and natural steps and evolutions in those sequences of planned events.

Close project management to 'business as usual' performance will aim to avoid adverse impacts.

Making sure the newly responsible organisations are properly prepared in their new 'Operating Models' to successfully and efficiently perform their new roles in the new market arrangements.

Electricity market reform in the UK



Some golden rules in unbundling

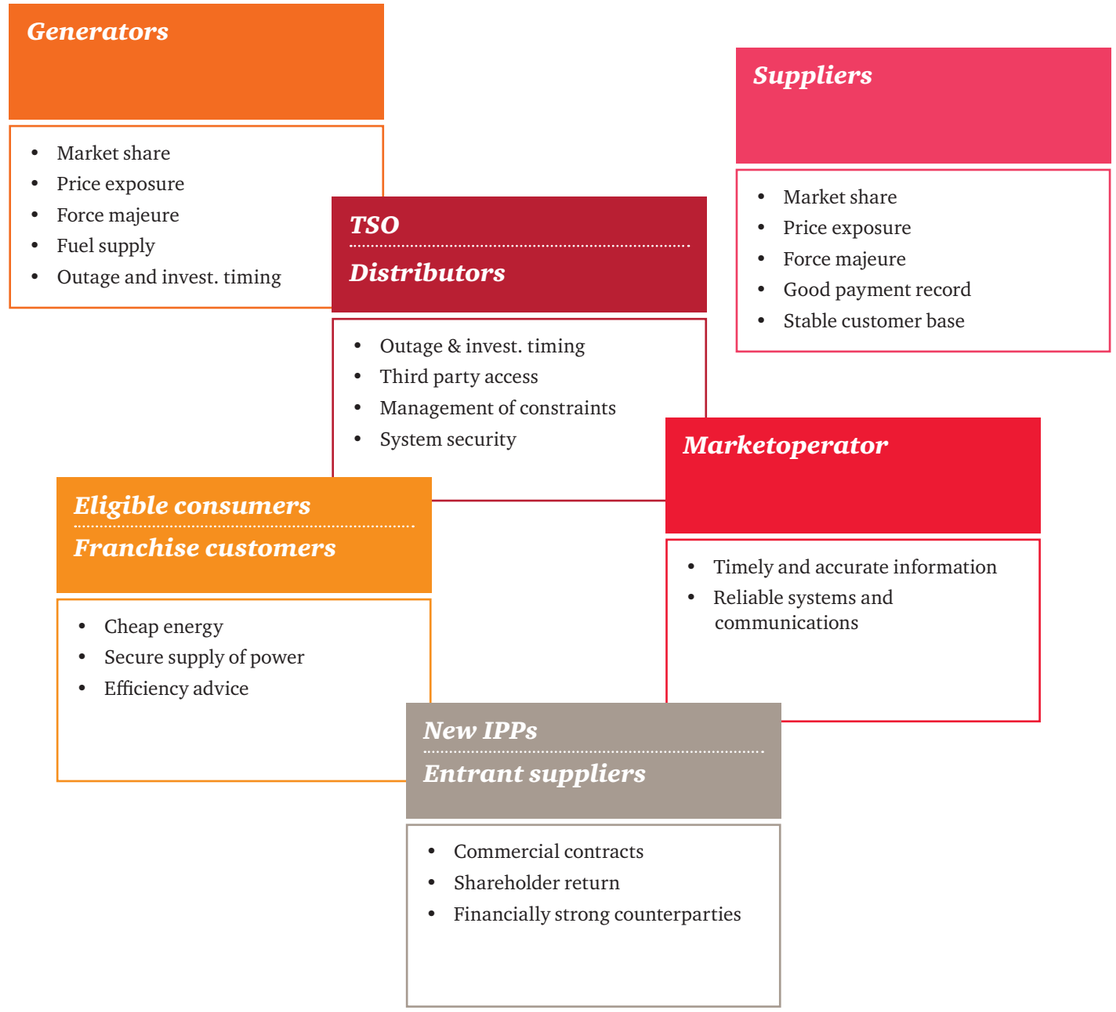
- Get a good handle on the achievable sector revenue envelope that may be anticipated over a (say) 10 year horizon. Prices matter.
- Understand the technical capability of assets and systems and likely, new capital investment necessary to achieve desired 'service standards'.
- Create a well-informed view of the balance sheet strength and capabilities of participants expected to play key roles in the transition and the post-reform structure to avoid insolvency and non-performance risk and ensure those companies can finance the investments they are required to undertake.
- Remember that through a long-term horizon (e.g. 10 years) there are factors and events are beyond the control of the industry which can only be assumed/estimated. In particular, this is true for global fuel prices, interest and exchange rates and the price of steel and concrete that drive capital expenditure costs. It is also true that capital projects can take longer to achieve commercial operation dates than originally estimated. Scenario and contingency planning and sensitivity tests are important in determining realistic implementation timescales.

Requirements of participants

It is important to consider the ability of unbundled companies to finance their activities when managing and planning unbundling.This is typically a constraint adopted in market design and, in that, how commercial contracts can protect cash flows and preserve balance sheet values.Whether Government wants to put its own balance sheet behind companies and how it wishes to engage in the process differs across countries and markets.What consumers can afford is often key.

- Private financing is generally more expensive than public financing, so traditionally Governments seek to ensure risks are also transferred to private operators to justify such additional costs of financing.
- New market designs can reveal the costs and value of resources to both consumers and producers perhaps for the first time.With the right systems and planning regimes market participants can then better optomise behavior to the good of the whole.Detailed design arrangements linking the independent actions of market participants typically revolve around a System and Market Operator according to the processes laid out in the Market Code.
  - The flow of payments from suppliers to resource owners applies a value to the resource, and the contracts which are put into place eg Power Purchase Agreements can bring value into companies and help limit revenue volatility.
  - Whatever organisation structures and accounting arrangements are put into place, separated entities should be incentivised to behave in the interests of the system even when operated independently and without undermining the security of other businesses in the value chain which might jeopardise creditworthiness.
    - Creditworthiness across the unbundled value chain is key to long term sustainability of any new market model.

- Liberalisation brings risks to both the regulated and competitive segments of the market.
  - Competitive market risks include a requirement to trade power to manage volume imbalance risks and both long term and short term price risk.
  - Such competitive risks have led to significant issues such as:
    - Insolvencies in both generation and Supply businesses.
    - Risks of both over-selling and under-selling forward volumes and being exposed to unexpected imbalance payments.
    - What can become unaffordable collateral exposures in trading arrangements.
- Each stakeholder in the unbundling process would be affected in different ways:
  - Operators may require a new operating model, a separation of activities and costs, new systems, processes and governance procedures, as well as an enhancement of the skills of its employees through training.
  - The government's interests lie in its investment in assets, improving the efficiency of the market, introducing competition and, where applicable, complying with regulatory and environmental directives.
  - Both the regulator and any consumer organisations will likely focus on consumer protection, keeping electricity prices low, encouraging competition and ensuring the process is a transparent one.



Price signaling for investments (Generation, transmission and delivery)

There are a range of constraints and challenges to be addressed in combining unbundling with the implementation of price controls, including tariff acceptability, financial stability and security of supply with the right environmental footprint.

In the natural monopoly network businesses the structure and pattern of regulation can deliver a firm environment for rewarding investment through the build up of a Regulated Asset Base but this is typically matched with an obligation to justify expenditures to achieve performance outputs of value to users. Moreover such businesses are typically required to offer open, transparent and non-discriminatory Third Party Access.

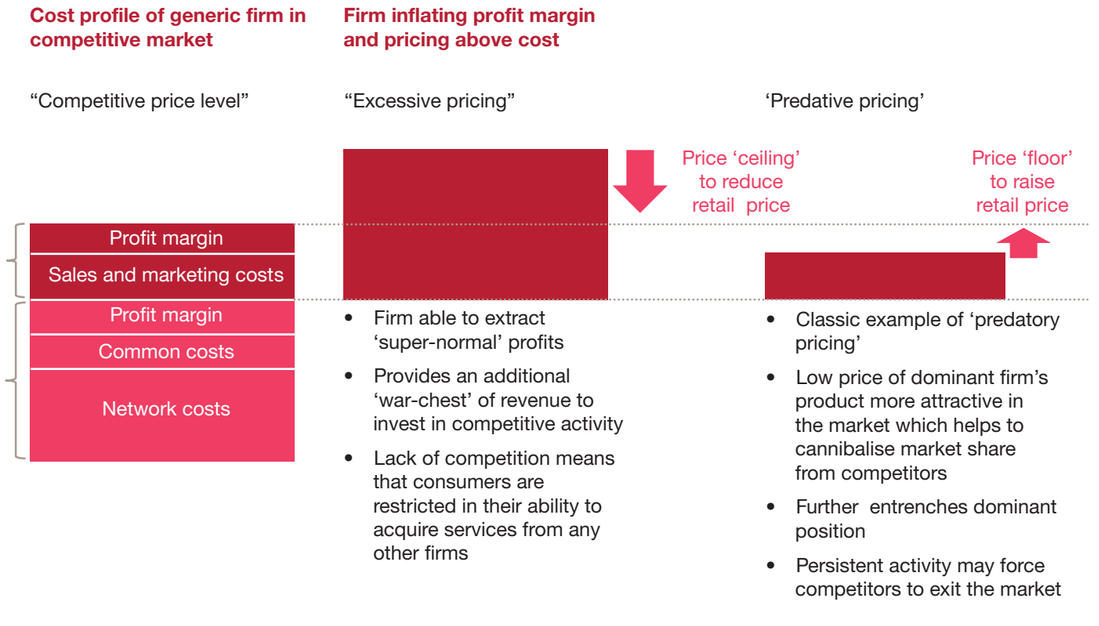
Positive investment signals principally include a strong forward curve for relevant traded products, with appropriate levels of churn, volumes and market participants. Regulations to improve liquidity in the wholesale market such as a capacity market are currently under consideration in the UK.

Requirements to participate in traded markets creates additional challenges such as:

- How to hedge exposures to what can be volatile wholesale market prices; and whether to do so through contracts and trading or some mix of physical hedges and a trading strategy.
- How to incentivise investment in costly renewable energy or the purchase of energy from renewable suppliers.

Competitive advantage (retail supply)

In retail supply markets, competitive advantage can be gained by participants through pricing to attract target customer groups, as set out in the diagram below, as well as customer service strategies.



The UK regulator Ofgem is currently conducting its Retail Market Review to address issues around consumers' lack of information on tariffs and the difficulty of comparing offers between companies.

Markets for retail pricing can be segmented through a range of techniques in order to simplify choice for consumers thereby encouraging competition in the market. Segmentation methods include:

- Payment methods – the way in which the customer pays for their electricity such as by direct debit, cash or cheque, as a monthly sum or pay as you go.
- Meter type – different types of meters, such as a prepayment meter, a smart meter or a standard meter.
- Renewable tariffs – reflecting the additional costs of 'green' energy.
- Smart metering offers – Usage/regional/time of day.

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