

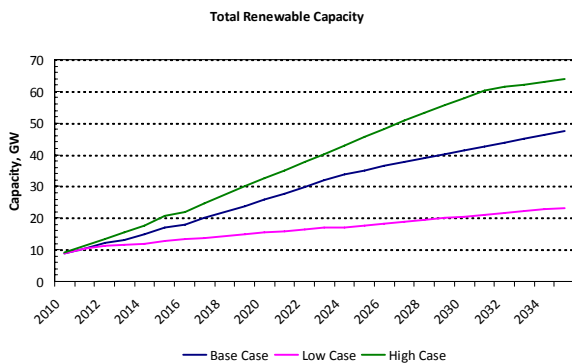
October 2009: Proposed change to the Renewables Obligation support mechanism likely to stimulate moves towards a low carbon electricity sector ... assuming sufficient capital is available to make the required investments

In mid-July, the Government published its strategy for reducing the country's CO₂ emissions by 18% compared to 1990 levels by 2020, en route to an 80% reduction by 2050, in *The UK Low Carbon Transition Plan*, and accompanying *Renewable Energy Strategy*. The latter highlighted some key planned changes in the financial support for renewables, one of which in particular has significant implications for our forecasts for future development of the electricity market.

The Renewables Obligation (RO) is currently based on fixed annual targets for renewables generation as a share of total supply, which was intended to incentivise new build to fill any shortfalls against the trajectory towards the 2020 objective. However, this has proven to be unsuccessful in practice, and hence the Government intends to have the obligation switch from 2016 to being based on a headroom-only system, i.e. where the target is always 10% above the projected level of renewables generation.

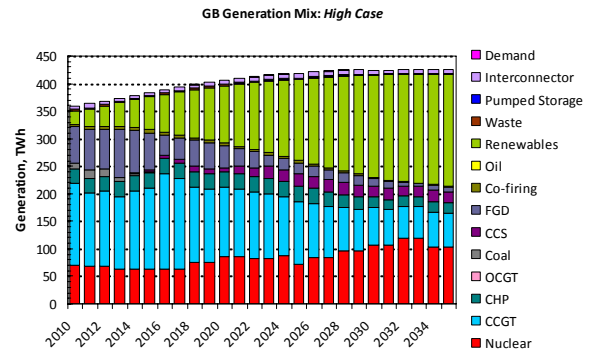
This effectively means that the expected value of a ROC is 110% of the buyout price, and brings some desired price stability to the system with variations only down to short-term differences between predictions of ROC production (made in setting the obligation level for the following year each October) and outturn. Compared to our July 2009 forecasts, which were premised on a continued, growing fixed obligation which was quickly exceeded in the Base and High Case scenarios resulting in ROC values below the buyout price, this new expected ROC value adds as much as £10/ROC.

The consequence of this extra value for renewable generation is a much greater level of renewables build, with the new Base Case forecast exceeding the previous High Case by 2020, and the High Case having almost 50% more than before – and in fact reaching our estimated 35 GW resource limit for offshore wind by the end of the forecast period.



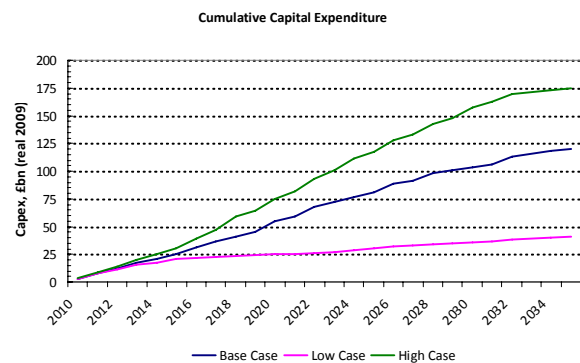
Renewable capacity is expected to be built at a greater rate than previously as a result of a headroom-only obligation.

Our high case scenario consequently becomes dominated by low marginal cost, low CO₂ nuclear and renewables generation, which comprise almost half of the total by 2020 and over 70% by 2030 – which will have big implications for system management, with a significant amount of fossil plant, operating at low annual load factors and very flexibly, required to help maintain supply security against the intermittent and uncertain wind and inflexible nuclear output.



Renewables and nuclear comprise the bulk of the generation mix in our high case scenario ...

This does appear to be successful in the overall goal of reducing CO₂ emissions with a reduction of 40-55% by 2020 compared to 1990 levels of 205 mte and 60-75% by 2030 – but would require significant capital expenditure, up to £75bn by 2020 in power stations alone (and even more in transmission infrastructure to connect them to the grid) and a similar sum in the subsequent decade.



... but would require considerable levels of investment to realise.

This in turn would need to be remunerated through higher customer bills – with the average domestic consumer estimated to have to pay 30% more in real terms by 2020.

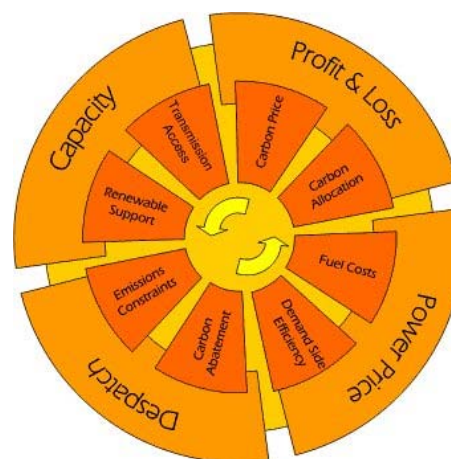
PowerView is an assessment of the potential development of the Great Britain wholesale electricity market published quarterly by IPA Energy + Water Economics, including **long-term forecasts of electricity, gas, CO₂, and Renewable Obligation Certificate (ROC) prices.**

The report investigates the **key drivers** which will impact on the electricity market over the next 25 years:

- movements of other energy **commodity markets** (including oil, gas, and coal);
- **regulatory developments** at both the UK and EU level, including the EU Emissions Trading Scheme (ETS) for CO₂, the Large Combustion Plants Directive (LCPD), the climate change package, renewables targets and changes to the Renewable Obligation (RO) support mechanism;
- **security of supply** concerns as generation capacity is closed and demand for electricity grows; and
- the rate of development and cost of **new technology**, such as carbon capture and storage (CCS), third-generation nuclear, and large-scale offshore renewables, and the resultant deployment by market participants.

Our proprietary market model **ECLIPSE** (*Emissions Constraints and Policy Interactions in Power System Economics*) is able to capture the complex interactions between these various economic and non-economic drivers through a linear optimisation methodology to help quantify their impact on the industry.

A significant advantage of the approach used by ECLIPSE is that electricity and ROC prices, and capacity build and closure, are all assessed simultaneously; with the effect each has on the other thus forming an explicit component of the results.



We explore a credible range of outcomes for all of these drivers in the form of **three scenarios** under which power and ROC prices are forecast against **self-consistent assumptions** for fuel and CO₂ prices, with economically rational plant closure and build decisions. We seek to reflect the range of conditions that have been experienced over the past eighteen months, and provide a view of the most probable long-term balance between the extremes:

- **High Case:** With high energy prices (based on an underlying real oil price in excess of \$100/bbl) and strong environmental concern characterised by a high CO₂ price as seen in early- to mid-2008, the trend is towards a low-carbon world. Nuclear and renewables would be very profitable given the high power prices and would be expected to dominate the new build, while gas would be preferred to coal for the balancing generation.
- **Low Case:** This could be taken to represent a depressed economic environment as currently experienced, characterised by low energy prices (oil at \$45/bbl) and a lesser regard for environmental concerns. Coal would be advantaged by the low CO₂ price, while low power prices would deter nuclear and renewables build, and hence the system would continue to be dominated by fossil fuels.
- **Base Case:** Our baseline case is between these two extremes, as over the long-term it would be expected that while immediate priorities will shift, the overall development will be a balance between the objectives of **security of supply, environmental protection, and affordability.**

For more information about how *PowerView* can be of use to your business, including how we could develop bespoke forecasts to meet your specific requirements, or to purchase the **full October 2009 report**, please contact us at:

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