

Rebalancing Act: The impact of policy cost changes

The Pathway To 2050

A legally binding target to deliver a net zero economy without a firm pathway and in a post COVID-19 world...

- In June-2019 The UK Government committed to a net-zero target for carbon emissions by 2050.
- Decarbonisation of the UK electricity sector has quadrupled capacity since 2010, delivering just over 50% of generation in periods.
 Mature technologies are achieving grid parity without the need for subsidy.
- UK consumers have and will continue to feel the financial burden of increased electricity costs due to levies & taxes associated with the support which has underpinned the renewable generation sector. This is likely to continue until the mid-2020's and begin to slow down into the late 2020's and early 2030's as subsidy funding declines.
- There are significant challenges to achieving Net Zero and as part of the UK Governments Decarbonisation of Heat & Gas Strategy the focus has shifted towards the gas sector.
- It remains difficult to foresee what the UK gas sector will look like in 2050... A significant funding & investment challenge.
 - Reduce gas in favour of electrication i.e. Heat pumps.
 - Increasing the volume of green gases i.e. Biomethane.
 - Develop the hydrogen sector as part of a Gas / Hydrogen mix or as a long-term alternative fuel i.e. SMR gas "blue" hydrogen (Inc. CCS) or Electrolysis "green" based on low-carbon energy being used.
 - Re-purposing the UK gas grid to supply water as part of a mass rollout of heat pumps (not part of current policy thinking).
 - Promoting Solar thermal as an alternative to traditional Solar PV.
 - A mixture?

The Pathway To 2050

Guidehouse baseline trajectory to Net Zero 2050



- Gas-grid reinforcement & investment
- Feasibility & planning for CCUS (Blue Hydrogen)
- Planning & blending hydrogen mix 20%+
- Creation of Hydrogen & Biomethane zones
- GS(M) regulations (0.1%<) needs reconsideration
- Thermal energy calculations revisited

- Emergence of Hydrogen will depend on the commercialisation of CCS
- Cost of Hydrogen manufacturing will determine application
- Retro-fitting existing properties will be challenge esp. Heat Pumps
- Subsidies will be required for emerging infrastructure & technology
- Electrication of heat load unlikely (in majority) due to lack of flexibility in generation and increased volatility of heat load weather demand

Consumer Impact Of Policy Today

Consumers are not yet feeling the impact of gas & heat decarbonisation as a direct cost but are starting to see challenges for purchasing Green Gas

- **Standards:** Minimum energy efficiency standards are in place and will continue to evolve to capture owner-occupied properties with future minimum EPC standards requiring a far greater investment in building efficiency.
 - Switching to low-carbon heating (i.e. heat pumps, hydrogen boilers) is not likely to form a mandatory part of any future minimum efficiency standards until the 2030's.
 - Installing heating through electric sources may become part of future legislation but this is subject to the wider debate as to how to decarbonise the sector.
- Levies & taxes: Currently there are no levies & taxes included in delivered gas costs as there are within electricity costs. There are no immediate plans to do so and this will depend on:
 - Investment in the growth of biomethane gas requiring subsidies beyond the RHI.
 - Support subsidies to roll-out heat pumps across the majority of UK domestic heat premises.
 - Investment in hydrogen projects.
 - Reinforcement and improvement to the UK gas grid. (IMRP Iron Mains Replacement Programme = 2032).
 - The UK Government has launched a consultation on a Green Gas Levy on suppliers to support funding for an increase in Green Gas (biomethane). Anticipated to launch Autumn-21.
- Subsidies, minimum standards & support mechanisms to deliver innovations may depend on whether we see a more regional "Town Gas" approach like the H21 Leeds City Gate project or a full UK network approach. A smaller and more regional approach would require less immediate investment in grid investment and is likely to be the initial baseline until the early 2030's.

Green Gas Premiums

Based on actual Beond negotiations for live clients we currently see a difficult & volatile future for consumers wishing to pursue Green Gas Certificates





- Short-expiry (Dec-21) certificates available and purchased by a Beond client for 0.419p/kWh.
- Aug-20 no short-expiry certificates available with a market rate of between 0.7p/kWh and 1.00p/kWh offered from 5 suppliers.
- Numerous suppliers refused to offer Green Gas to smaller consumers (<10GWh) stating that certificates were being held for larger opportunities.
- (1) 0.6GWh heating load CAL20 = \pounds 2,665.
- (2) 25.7GWh process load $CAL20 = \pounds 107,768$.
- $CAL21 = (1) \pounds 4,453 \pounds 6,362$
- $CAL21 = (2) \pounds 180,042 \pounds 257,203$
- CAL22 = (1) £5,089 £7,316
- CAL22 = (2) £205,762 £295,783

Why It's Difficult To Predict? There are a multitude of issues to consider before we see progress Cost of retro-fit Naive expensive & Storage expectation on Green Gas limited heaters, Solar role of application Levy on Thermal, Heat Biomethane Consumers **Batteries** Replacing Ο consumer assets (circa 23%+ Hydrogen) Clean Heat Developing Grant Scheme Amending rules further Low-carbon for heat pumps on 0.1% heating Biomethane hydrogen Insufficient sources funding at this \bigcirc stage Ο Ο 0 0 Increasing the % Electrification of of hydrogen in heat load the existing grid

An Assumptive Pathway

Consumer increase in delivered gas based on non-energy cost increases



- Analysis considers the main underlying support measures needed to deliver increased Biomethane generation to the grid, support Hydrogen projects (geographically constrained until the mid 2030's) & the development of a new heat storage and balancing scheme which is not yet envisaged but is forecast by Beond.
- Does not consider consumer asset replacement, minimum energy standards as part of increased compliance (i.e. future phases of ESOS, MEES or other mandated rules on efficiency).

Conclusions

Low-carbon heat & process gas is the future – the pathway is less clear

- Non-energy costs for gas is an inevitable conclusion based on the support required to deliver further Biomethane projects, develop the greater role of Hydrogen as part of a mixed-grid (moving to 100% by 2050) and to support the pathway to heat storage & balancing.
- Cost impacts will be limited until the early 2030's with an anticipated increase in non-energy costs associated with a major increase in Hydrogen projects after investment in network reinforcement is complete.
- ESOS Phase III and the next stages of MEES (towards 2030) may see enforced minimum standards for gas utilisation efficiency.
- Consumers seeking to evaluate the role of CHP (gas or co-fired) may wish to include a risk assessment as to the impact of non-energy costs within the calculation of asset efficiency based on increased regulatory costs and the potential for easing of non-energy costs for electricity into the 2030's.
- Consumers should begin evaluating gas consuming assets or processes to determine if a mixed Hydrogen / Natural Gas network could cause problems. It is anticipated that the majority of gas consuming assets purchased after 1996 should run on a network which includes up to 23% Hydrogen.
- As a final personal thought, I personally believe the future for the EV sector will be limited given the resource constraints associated with battery production (subject to any innovations in technology) and Hydrogen will play a much greater role into the 2030's for haulage & EV fleet. The 2030's will see the start of the Hydrogen revolution.

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