Future of gas boilers & alternative fuels

Andy Dabin
Hamworthy Heating
Who are we?

Hamworthy Heating

• British commercial boiler manufacturer
• Our roots date back to 1914
• Design, test, manufacture and deliver energy efficient commercial heating, hot water and renewable solutions to buildings across the UK
• Decades of experience go into every nut, screw and bolt
• Since 2008, we’ve been part of Groupe Atlantic and now part of their growing UK division

Andy Dabin

• Product Manager
• Working in the heating industry for 37 years
• Helped deliver domestic and commercial products to market
What are we talking about?

• Government activity
• Carbon Budgets
• Pathways
  • Electric
  • Hydrogen
  • Emission removal
• Barriers
• Future products?
What's the Government saying/doing?

- UK Climate Change Act 2008
- UK to reduce greenhouse gas emissions by at least 80% by 2050 compared to 1990 levels
- Setting of 5 year caps or "Carbon Budgets"
- Net Zero Carbon – Stated by Prime Minister in 2019 (100% reduction in CO2 below 1990 levels by 2050)
- Clean Growth Strategy
  - Setting pathways and roadmaps to achieve the "Carbon Budgets"
  - Decarbonising the grid
    - Pathways being explored are:
      - The Electric Pathway
      - The Hydrogen Pathway
      - Emission Removal Pathway
- Future Homes Standard (From 2025 no fossil fuel heating in NEW HOMES)
- PM Th' contr
  - says gas boilers we will contr
  - be extinct by 2025 - and here's what
Carbon Budgets

1st Carbon Budget 2008 – 2012 = Met and outperformed by 1%
2nd Carbon budget 2013 - 2017 = Met and outperformed by 5%
3rd Carbon Budget 2018 – 2022 = Looking like it will meet and outperform by 4%
BEIS are now setting the 4th and 5th Carbon budgets covering 2023 to 2032
The rate of reduction is not fast enough however to meet the full commitment
Clean Growth Strategy - Pathways
Electric Pathway

- Electric vehicles
  - Process started with higher taxes on diesel
  - Rules to see all diesel vehicles replaced by 2040
  - More low polluting zones outside London
- Replacement of electric generation to new cleaner fuels
- Replacement of gas boilers
  - Heat pumps pushed over gas
  - No natural gas in new homes from 2025

• 40% reduction in coal-fired electricity since 2012
Hydrogen Pathway

- Potential for hydrogen-powered vehicles
- Introduction of up to 20% hydrogen to lower emissions in current gas grid
- Replace sections of gas grid to move completely to hydrogen
- Projects in UK underway to prove concepts
  - Hy4Heat – 100% hydrogen
  - HyDeploy – 20% hydrogen mix into current gas network
HyDeploy is a pioneering hydrogen energy project designed to help reduce UK CO$_2$ emissions and reach the Government’s net zero target for 2050 - **Potential to save CO$_2$e of 120 million tonnes & £8 billion cumulatively by 2050.**

Keele campus:
- 101 residential houses
- 8 multi-residential buildings
- 17 office blocks & laboratories
- 7 recreational & service facilities

Higher levels of hydrogen are permissible in many networks.
Diverse regional Hydrogen projects

Drax confirms plans to create UK’s first zero-carbon cluster in Humber

Drax Group has confirmed plans to build a large-scale zero-carbon industrial cluster featuring carbon capture, usage and storage (CCUS) technology, during the latter half of 2022.

LAUNCH OF UK GOVERNMENT HYDROGEN FOR TRANSPORT PROGRAMME

20TH AUGUST 2017

Press release
Hydrogen-powered distillery to produce sustainable gin

First-ever gin distillery to use hydrogen from renewables to produce environmentally friendly gin.

HYDROGEN PROJECTS
EMEC

The Department of Business, Energy and Industrial Strategy (BEIS) has today announced that we, along with our partners Arup, Klaes Gaeste and the Offshore Renewable Energy (ORE) Catapult, have been successful in our bid into their Hydrogen Supply Competition.

The £500,000 prize will enable us to deliver Phase 1 of Project Metallifera – a feasibility study that will conclude in the autumn, focusing on the potential to supply hydrogen from offshore wind in Fife.
Emission Removal Pathway

- Carbon removed from the atmosphere by plants (biomass)
- Sustainable biomass could be considered
- CCUS required (Carbon Capture)
HyNet North West is a hydrogen energy and Carbon Capture, Usage and Storage (CCUS) project (~£0.9 billion). The goal of HyNet is to reduce carbon dioxide (CO2) emissions from industry, homes and transport and support economic growth in the North West.

HyNet is a cost effective option compared to alternative projects with similar CO2 savings. This is due to:

- The concentration of industry in a relatively small geography (consistent gas demand, avoiding the need for hydrogen storage).
- Hydrogen blending for homes and businesses means existing domestic appliances do not have to be replaced.
- Close geographical proximity and timing of depletion of the Liverpool Bay oil and gas fields for CO2 storage.
What are the challenges?

- Resilience of electric grid to cope with additional demand
  - Power supply not sufficiently decarbonised
  - Consumers (and installers?) not ready for heat pumps
  - Higher product costs
  - More complex system designs
  - F Gas regulations change preventing the use of refrigerant gasses
  - Installers and support network not matched to demand
  - Design and insulation levels of homes not at correct standard
  - Cost of electricity compared to gas

- Safety of hydrogen
  - Installer and support network insufficient to swap appliances to hydrogen in correct timeframe
  - Large scale hydrogen at reasonable cost may not be possible
  - Gas grid will need to be updated by 2030 to hydrogen-proof pipework
The future heating products

- From 2025 a large proportion of heat pumps envisaged in new homes
  - Maybe hybrid to start with
  - Less impact on electric grid and infrastructure as designed into building
- Large sections of the grid may become hydrogen fuelled
  - This is unlikely to take effect until 2030 based on products and infrastructure
  - Appliances may need to become hydrogen designed and convertible back to natural gas until the supply industry is ready
- There is no one clear route at present that offers a solution that fits all like the current gas boiler selection
  - A mix of all will be required
- New products not yet realised