Micro-CHP offers carbon savings over gas boilers in the UK until 2030

Delta research has evaluated the extent to which micro-CHP can deliver carbon reductions today and into the future in the UK. Our analysis has shown that:

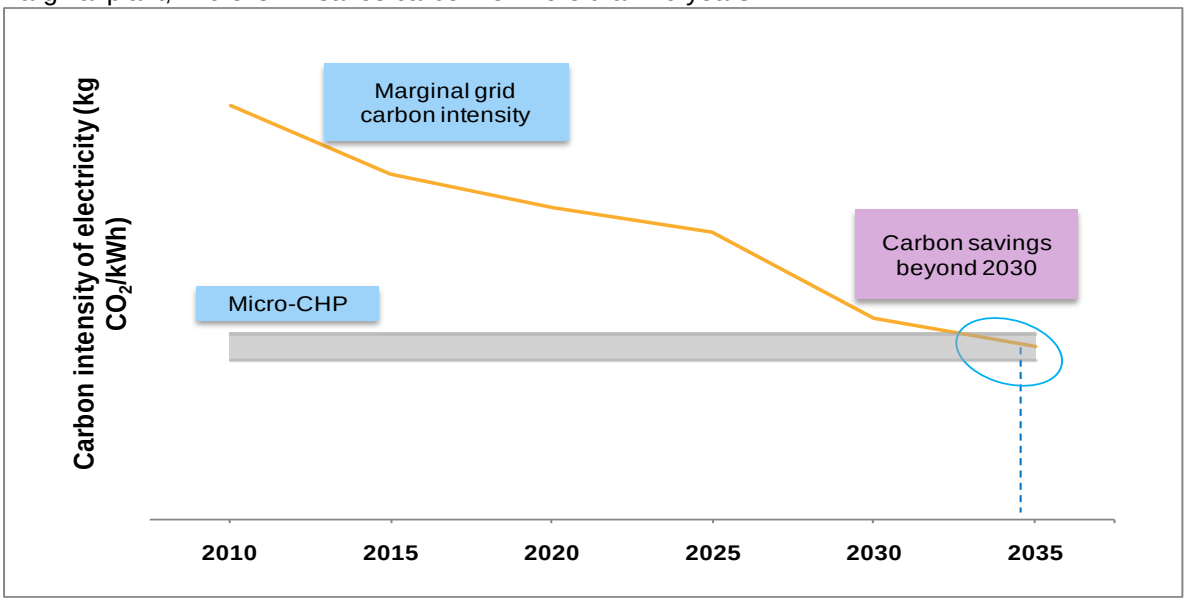
- **KEY MESSAGE 1:** Stirling Engine and fuel cell micro-CHP cuts **carbon emissions until after 2030** when compared to a natural gas boiler.
- **KEY MESSAGE 2:** If anticipated improvements in micro-CHP technology materialise, and the gas network is decarbonised, micro-CHP can cut **carbon emissions beyond 2035.**

In our analysis, we used *marginal* grid carbon intensity as the reference for micro-CHP electricity because:

- Micro-CHP reduces the demand for centrally generated electricity
- Micro-CHP will not displace renewables or nuclear
- The UK Government recognises that CHP should be compared to the marginal grid electricity mix

Key message 1: When compared to a natural gas boiler, micro-CHP saves carbon to 2035

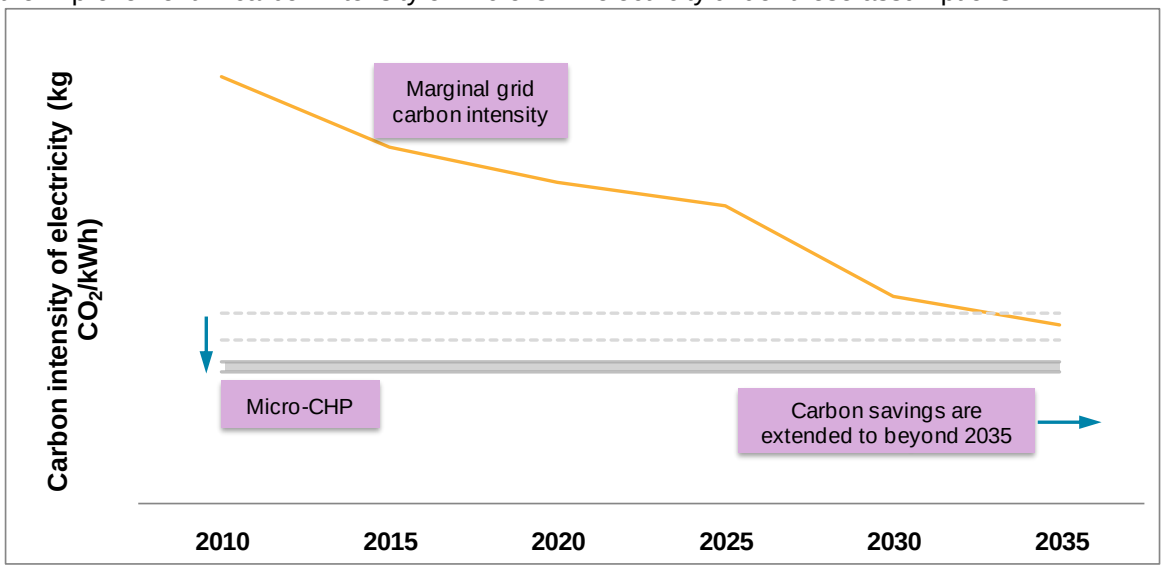
The graph below illustrates the carbon intensity of the electricity generated by micro-CHP and compares it to the marginal plant on the electricity grid. The grey rectangle represents the range in carbon intensity of electricity from Stirling Engine and Fuel Cell micro-CHP. When compared to marginal plant, micro-CHP saves carbon for more than 20 years.



Source: Delta Energy and Environment, 2010

Key message 2: Carbon savings are extended to beyond 2035 with increased micro-CHP efficiency, and gas supply decarbonisation

An increase in the electrical and overall efficiency of micro-CHP, coupled with decarbonising gas supply (through biogas injection), shows an improvement in carbon savings to beyond 2035 against marginal grid carbon intensity. For this analysis we modelled the impact of decarbonising gas supply by 10% and improving micro-CHP efficiency by 2%. The solid grey rectangle in the diagram shows the improvement in carbon intensity of micro-CHP electricity under these assumptions.



Source: Delta Energy and Environment, 2010

Delta's deep market knowledge of micro-CHP in Europe helps our clients in various ways:

Manufacturers & product developers

- Supports strategic development and tactical decisions
- Identifies opportunities for product deployment
- Identifies latest technology trends & developments

Policy makers & investors

- Informs policy maker decisions
- Informs investment decisions

Electricity & gas utilities

- Informs market strategy
- Supports technology selection and partnering decisions
- Market forecasting

Delta Energy & Environment is an independent research and consulting company specialising in decentralised energy & low carbon strategies.

Delta supports a range of clients with micro-CHP market intelligence including: E.ON, GDF Suez, EDF, Baxi, Bosch, Ariston, Vaillant and Viessmann

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