

Fuel switching and emissions savings in the residential sector ¹

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OVERVIEW

In Ireland the residential sector consumes 23% of final energy, which includes energy requirements for heating, lighting, cooking, etc. The residential sector also accounts for approximately one-quarter of energy-related CO₂ emissions. About three-quarters of energy use within the residential sector is for heating, hence the focus of policy actions within the Climate Action Plan to decarbonise residential heating. Within the home 72% of energy consumption is sourced from fossil fuels, most of which is from the most carbon intensive fuels of peat, coal or oil with the balance from natural gas. Natural gas is cheaper than coal and oil per unit of energy and less emissions intensive. This research examines why more households do not use gas where it is feasible to connect to the natural gas network and estimates the potential cost and emissions savings to households switching from peat, coal or oil.

Although there are many reasons why households do not use natural gas, we find that network connection fees proportional to distance are a key barrier to gas being selected as a home heating fuel among households within 30 metres of the gas network. Currently, a flat-rate connection fee of €249.70 is levied for gas network connections up to 15 metres distance and increases by €51.32 per metre thereafter. Under an alternative residential gas connections policy that sets out a flat connection fee of €249.70 for all properties within 30 metres of the network, i.e. eliminating the existing €51.32 per metre fee, up to 9,000 new residential connections are likely to arise, equivalent to 13% of the 69,000 unconnected properties within 15–30 metres of the network. CO₂ emissions are estimated to fall by 3.9% and fuel expenditure by 1.5% summed across all 69,000 unconnected households within 15-30 metres of the network. Total CO₂ emissions savings

¹ This Bulletin summaries the findings from: Curtis, J., Tovar, M. A., Grilli, G., "Access to and consumption of natural gas: Spatial and socio-demographic drivers", *Energy Policy*, Available online: <https://doi.org/10.1016/j.enpol.2020.111614> or without paywall until 8 July 2020 via <https://authors.elsevier.com/a/1b5GJ14YGfJMH>

exceed 17,000 tonnes per annum, the value of which exceeds the lost connection fee revenue.

METHODS

Data used in the analysis comprises anonymised household level data on gas network connection, gas consumption, property attributes, and household socio-demographic characteristics. The Central Statistical Office (CSO) created and provided access to the research data file. The research focused on urban areas where network natural gas is a potential fuel option and the dataset included over 460,000 homes located within 30 metres of the natural gas network. Statistical techniques were used to examine fuel choice and consumption levels and the results were used to undertake scenario analysis on the potential impact of a change in network connection fees.

POLICY IMPLICATIONS

The most striking policy implication of this research is that it is advocating, as a climate policy initiative, that households be incentivised to switch to fossil natural gas as a heating fuel. At one level this appears to conflict with current Irish climate policy as it supports fossil-fuel lock-in. Actions 60 and 61 of the Climate Action Plan include the phase-out of gas boilers in new and existing dwellings. But Action 71 of the Climate Action Plan proposes the development of biomethane injection into the gas network, a process that has already commenced. As the share of biomethane increases within network gas supplies, the assertion that such a policy represents fossil-fuel lock-in diminishes.

Over 868,000 Irish households (51%) use the carbon-intensive fuels of either oil, coal or peat as their primary heating fuel. Less than 8% of these households can realistically connect to the gas network but to achieve Ireland's climate targets the vast majority will have to reduce the carbon intensity of the energy they use (and improve their homes' energy efficiency). Households that switch to natural gas will make emissions savings that contribute to climate targets. Even greater savings are possible where households switch to renewable fuels or electricity generated from renewable sources.

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