

ESRI Opening Statement to the Joint Committee on Climate, Environment and Energy on Wednesday 25 March 2026

I would first like to thank the Committee for the invitation to appear today and for the opportunity to discuss recent ESRI research on the decarbonisation of residential heat. My name is Muireann Lynch and I am joined by my co-author Niall Farrell.

By way of context, there has been a considerable amount of research undertaken, in Ireland and internationally, on residential heat decarbonisation in recent years. This is due in no small part to a large volume of high-quality data that has been made available to us and to other colleagues thanks to the Sustainable Energy Authority of Ireland, the CSO, and various energy industry participants across the public and private sectors alike, as well as funding for research from SEAI, Research Ireland, Horizon Europe and energy industry organisations. We are extraordinarily indebted to these bodies for these data, funding and expertise. As the research in question uncovered some common and underappreciated themes, we prepared a review paper to summarise and synthesise these findings with a view to informing policy.

As per the latest projections from the EPA, Ireland is expected to fall short of carbon reduction targets, including in the residential sector. Current policy envisages decarbonisation of the residential sector primarily through energy efficiency and electrification via heat pumps. These require considerable investment by homeowners and by the State, as well as behavioural changes. The financial barriers are well understood in the literature, and our paper touched briefly on those figures. However, behavioural and technical barriers are less appreciated.

On the former, the majority of policy levers for residential heat decarbonisation are modular in form, relying on homeowners to take the initiative (see Table 1). This approach contrasts with electricity decarbonisation policy, for example, where no direct action is required by homeowners. Research also finds that a sizeable proportion of households are unlikely to undertake any home improvements, including retrofitting or energy saving measures (see Table 2). Householders also report considerable variance in how disruptive they perceive home improvement measures such as retrofits (Figure 1). These findings suggest that policy interventions may be improved by accounting for behavioural considerations, alongside financial and environmental considerations, at design phase.

On technical barriers, a wide range of international literature has found that actual energy consumption does not perfectly align with engineering-based predictions contained within energy performance certificates, the Irish version of which is the BER. Across BER bands, energy usage does not vary as much as predicted by engineering models.

We do not have data to fully explain this result in an Irish context, but there are several likely reasons. The first is the “rebound” effect, whereby energy efficiency investments can induce an increase in energy demand. This is because occupants may set higher comfort levels upon upgrading their insulation, and the emissions saving is less than predicted. Second, there may be error in how BER captures the performance of building fabric; BER certificates, and the assessment that goes into generating them, often involve the use of standardised parameters. This provides a useful indicator, rather than a perfect prediction, of energy performance.

Thirdly, householders may “anchor” against a particular energy budget, and curtail their energy usage when they sense that their expenditure on energy is going beyond what they can afford. In addition, there is no data on the actual performance of heat pumps in particular in an Irish context, but data from the UK suggest that heat pumps do not perform at the efficiency levels assumed in various modelling exercises. Finally, homeowners may not operate their appliances or their homes in an optimal manner, for example by opening windows rather than turning down the heating.

The final sections of the paper have received rather less attention and focus on potential policy responses to these results. While the long run goal is most certainly full electrification of the housing stock, the literature suggests that supplementary, bridging measures, to assist in reducing emissions in the short to medium term, may be worth considering. Measures that require minimal investment or behavioural change from homeowners, and/or measures that move the onus from the homeowner to energy suppliers, may prove effective if targeted towards households that are least likely to retrofit or electrify.

Previous research estimates that 13% of households within potential connection distance of the natural gas network would switch from a higher carbon fuel to gas if there were no connection charge, leading to a 3.9% reduction in emissions. For homes that are not proximate to the gas network, lower carbon fuels such as LPG, or zero carbon fuels such as HVO, biodiesel or new generation e-fuels can replace kerosene with far lower financial or behavioural barriers. Finally, local authorities currently have financial incentives to upgrade existing stock to heat pumps, but not to install district heating.

There are, of course, advantages and drawbacks to all these policy options, summarised in Table 3. We present them as potential additional, supplementary measures to consider, alongside and in tandem with continued energy efficiency and electrification, as part of a potentially broader policy mix as we move towards decarbonisation.

In summary, this work assessed progress towards heat decarbonisation targets. Current projections suggest that achieving these targets will be challenging. Heat pumps and

retrofits play an important role in decarbonisation. However, there is evidence that retrofit emissions savings are potentially less than predicted. This points to the need for additional, rather than replacement, measures to meet residential heat decarbonisation goals.

We look forward to any questions you may have on these topics.

Supplementary material

Policy	Description	Decision maker
Better Energy Homes Scheme	Grants for individual retrofit measures	Homeowner
One Stop Shop Scheme	Grants for deep retrofits	Homeowner
Warmer Home Scheme	Grants for retrofit measures for low income households	Homeowner (actual measures chosen by SEAI)
Home Energy Upgrade Loan	Low cost loans for financing retrofit measures	Homeowner
Energy Efficiency Retrofit Programme	Deep retrofitting local authority housing	Local authorities
Retrofit tax relief	Tax relief on expenditure on retrofit measures in the rental sector	Homeowner
VAT rate cut on solar panels	Removal of VAT on solar panels for residences and schools	Homeowner
VAT rate cut on heat pumps	Removal of VAT on heat pumps and associated heating systems	Homeowner
Renewable Heat Obligation	Requires 1.5% of fossil fuel to be met by renewable fuels (not yet operational)	Supplier

Table 1: Residential heat decarbonisation policies

% of respondents who agree with each statement	Scenario description
22.9	We're content with our home as it is. We wouldn't dream of making any major changes to its layout or physical properties.
29.6	We are aware of things we could change about our home by renovating. We may go ahead and renovate at some point in the future, or we may not; it all depends. We haven't yet got a good sense of the costs, contractors available, and how to get the work done.
26.4	Planning renovation works but still finalising the details. We have some information about costs and financing options. We've talked to experts or contractors, and one or more has visited our home.
21.1	Renovations are completed, or all the details of our renovations are decided and renovations are underway with contractors.

Table 2: Attitudes of Irish homeowners (owner-occupiers) towards home improvements

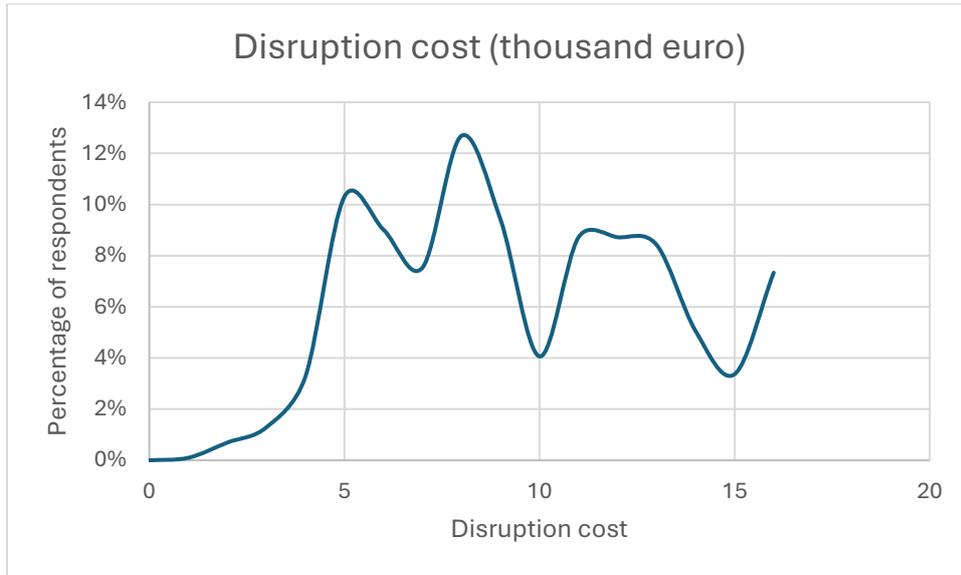


Figure 1: Disruption cost of minor home renovations, described as “Minor internal works, dust and materials affecting use of some rooms during renovation”

Policy	CAPEX to household	Decision maker	Behavioural barriers	Lock in potential?
Retrofit existing stock	> € 25,000	Homeowner	Significant	No
Heat pumps	€10,000 > €25,000	Homeowner	Significant if tied to retrofit	No
Thermal energy storage	< €10,000	Homeowner, local authority or developer	Significant if tied to retrofit	No
Increase gas grid connections	< €10,000	Homeowner	Moderate	Yes
Renewable Heat Obligation	n/a	Suppliers/Government	None	Unlikely
Switch to LPG	Low	Homeowner	None	Yes
Switch to Biofuels	Low or negligible	Homeowner	None	Unlikely
Mandate smart controls	Negligible	Government	Low	No
Smart contract opt-out	None	Government/CRU/Suppliers	Moderate	No

Table 3: Existing and potential policy measures