eHeat Ireland response:

Call for Expert Evidence Climate Action Plan 2023

Introduction

eHeat Ireland (EHI) is a member trade association established in 2021 to accelerate the decarbonisation of heat through electrification. The association is an all-Ireland body led by industry experts who are committed to promoting the use of renewable electricity to generate decarbonised heat as an economically viable alternative to fossil fuels.

We want to encourage the use of electric heat 'eHeat' and to create awareness for how deployment of the technology can support the achievement of 2030 Climate Action targets through emissions reduction and optimised use of renewable electricity.

Our members include end users, service providers, utility companies and technology companies. We have a common interest in decarbonising heat, and we want to campaign for changes within the Irish system that ensure a level playing field for eHeat versus fossil fuels.

The Climate Action Plan lays out specific targets when it comes to the change to renewable heat in our economy. Aiming to phase out fossil fuels for space and water heating in new and existing homes, the deployment of zero-carbon heating to 50,000 commercial buildings, the development of district heating with initial capacity of 2.7TWh, and the installation of 600,000 heat pumps.

With the correct policy framework electric heat can be expanded in Ireland which will have economic benefits and aid in the overall growth of renewable electricity with lower emissions and helping with security of supply.

Carbon Pricing and Cross-Cutting Issues

Consultation Questions

1. Are there any unintended barriers within the planning system that should be addressed at national policy level in order to deliver our climate ambitions?

Onsite rooftop solar can help provide both renewable and low-cost electricity to electrify heat at industrial sites, with some of our members working on rooftop solar projects which are multiple MW's in size. Expansion of rooftop solar can be greatly assisted through amendments to S.I. No. 600 of 2001, the Planning and Development Regulations, this to increase the threshold exemption for solar panels for commercial applications.

2. What further opportunities exist within our taxation system, beyond measures already implemented and planned, to promote emissions reductions, either on an economy-wide basis, or in specific sectors?

There has been changes to tax structures in regard to electricity used for heat. This is evident in Denmark.[1] A regulatory model of incentives can help encourage the growth in areas such as electric heat. A combination of taxation and subsidies should ensure that the average cost of electricity is never more than double the cost of oil/gas for heating in industry. If this is the case, then it will unlock the huge eHeat opportunity in Ireland.

3. Further to recent reforms to Ireland's green budgeting and public procurement policies, are there any additional measures that could be taken to integrate climate considerations into these policy frameworks?

Procurement policy can be a mechanism used by the State to expand renewable heat. There are approximately 11,500 public sector buildings in Ireland. Government Departments, agencies, and State Bodies could move building stock to renewable heat. Both as a practical means of reducing emissions and setting a wider example for the economy and mirrors ambition in the climate action plan of seeking "*the deployment of zero-carbon heating to 50,000 commercial buildings*". We note also the consideration in the Climate Action Plan to "*Examine how and when fossil-fuel heating systems could be phased-out of public buildings, including disallowing the installation of any new fossil-fuel heating systems*". We note further in a paper from the OPW[2] that "*Fossil-fuel heating can be phased out of public*

[1] Levelling the playing field: Aligning heating energy taxes and levies in Europe with climate goals, Regulatory Assistance Project, July 2022.
[2] Climate Action Plan action 57(a) re phasing out of fossil-fuel heating from public buildings
Final 8 April 2022

sector buildings" and that heat pumps are considered *"appropriate technologies for most applications."* A further element in this paper states the possible *"restrictions on leasing buildings with fossil-based heating systems."* Using procurement policies could aid in the shift to electric heat in the public sector with broad benefits.

4. Are there any significant cross-cutting gaps not previously discussed in Climate Action Plan 21 that need to be addressed?

There are economic as well as environmental benefits to decarbonising heat through electrification. Electric heat will also displace imported fossil fuels. Coupled with all of these, electric heat in the industrial sector will provide greater flexible demand and further help in the utilisation of 3TWh surplus renewable electricity. The wider benefits to the growth in electric heat for the overall development of renewable energy should be acknowledged.

Electricity

Ireland has seen great developments in renewable electricity generation but has been poor at the development of renewable heat. Electric heat can be used to utilise more of the renewable electricity we produce and utilise more of the existing electricity grid.

There is an important need to separate between traditional demand growth and that of decarbonisation and a flexible demand growth. For example, grid connections for flexible electricity demand could be offered on a non-firm basis, similar to some generator connections, which would speed up connections to the grid and maximise the utilisation of the existing grid. This distinction must be made so that policy does not prove a dis-incentive to the electrification of heat which must be allowed to contribute fully to decarbonisation in the economy.

ESBN have a stated aim to enable 80% renewable energy and 20-30% of flexible demand by 2030 and further to facilitate the adoption of electric vehicles to make up 35% of all vehicles and heat pumps across 30% of households[3]. This can only be achieved if the right incentives are in place to help grow heat electrification. Growing electric heat will provide flexible demand that can be controlled to respond to variations in renewable electricity supply.

[3] https://www.cru.ie/wp-content/uploads/2022/08/CRU202281a-ESBN-Recommendation-Paper-NNLC-Demand-Reduction-Schemes.pdf

Consultation Questions

1. What options are available to increase the penetration of renewable electricity beyond the up to 80% committed to in Climate Action Plan 2023?

We must have the correct regulatory framework to support flexible technologies that will in turn support the shifting of very significant quantities of renewable energy. The increased industrial electrification of heat has wide positive implications to the penetration of renewable electricity. For example, it results in less 'Dispatch Down' for Irish wind farms creating up to €200 million per year of savings assuming an 80% utilisation of 3TWh surplus renewable electricity.

Some economic benefits to the electrification of heat include:

-€300 Million Less CO2 Penalties
-€470 Million Less Fossil Fuels
-€200 Million Wind Energy Saved
-€50 Million More in Grid Usage

10. To incentivise microgeneration.

Changes in regard to planning, mentioned previously in regard to roof top solar, and an effective and functioning feed in tariff would be two key elements for the growth of microgeneration. Local production and use of energy locally is of benefit to the grid as a whole and the right regulatory framework must establish this environment.

Enterprise

The development of electric heat 'eHeat' in the economy provides broad economic opportunity. The growth in electric heat has the potential to create €1.5Bn annual economic benefit for Ireland.

The decarbonisation of energy use, especially heat, remains a significant challenge for companies. Electrification is a sustainable, efficient and economic, means of generating heat, and in recent years many countries within Europe have found it to be a highly effective way to decarbonise industrial heat. eHeat is also a flexible demand that can be controlled to respond to variation in renewable electricity supply.

Consultation Questions

1. What measures can be taken to accelerate the uptake of carbon-neutral low temperature heating in manufacturing?

Ireland has the worst performance in the EU for using renewable energy sources for heating and cooling. The electrification of heat is a sustainable and economic means of generating heat across various temperatures.

Heat demand in Ireland for industry accounts for 17.5 TWh or 38% of demand. The latest data from SEAI indicated that approximately 6.9 TWh of heat demands are up to 150°C. The Heat Roadmap Europe project included a division at 200°C for industrial heat and found that 57% of the heat demand in Ireland was <200°C, which equates to almost 10 TWh. Much of this demand can be met by the electrification of heat.

Generally low or medium grade heat dominates the heat demand, commonly supplied through steam from boilers/CHP which has a direct replacement through low carbon electric heat. Typical industrial heat pump applications are used across a broad spectrum of industries including food and beverage, agriculture and fishing, plastics, chemicals and electronics.

There is huge potential (>50%) for renewable heat in industry with existing technologies and heat pumps are the most widespread technology for industrial electrification. Lots of proven examples exist with over 20,000 installations each year. Ireland now has an abundance of renewable electricity to utilise (enough to power all of Galway city is currently thrown away). Growth seen in renewable electricity must be mirrored in growth in electric heat to fully utilise the resources we have for the benefit of the wider economy and combining heat pumps with thermal storage can take advantage of low-cost electricity during windy days when this electricity is wasted.

Converting industrial heat demand <200°C (10 TWh) to heat pumps will:

- Increase renewable heat to ~16%
- Carbon saving = 2.7 MtCO2 and avoided penalty €270m/yr
  *based on a cost of carbon of €100/tonne
- €440m per annum reduction in fossil fuel imports
  *based on fossil fuel price of €35/MWh

To fully exploit the benefits of the decarbonisation of heat through electrification the regulatory framework must work to enhance growth. Displacing fossil fuels in manufacturing will require the correct incentives to allow for expansion. Critical to this is ensuring the average cost of electricity is never more than double the cost of oil/gas for heating in industry either via taxation or subsidies. This includes addressing the electricity costs including the tariffs regime. The CRU have stated that if the existing electricity network

tariff structures are not fit-for-purpose *"they could hinder the changes that are necessary for the electricity system in the coming years in order to deliver a secure and cost-effective low-carbon future."*[4]. We must ensure that tariffs which are under review by the CRU currently, consider the benefits of electric heat, in terms of decarbonisation, security of supply and providing flexible demand.

2. What measures can be taken to decarbonise high temperature heating in industry?

In terms of electrification of high temperature industrial heat, high temperature heat pumps are a technology that is evolving rapidly. The current application of renewable heat in industrial heat demand could be seen as being categorised as commoditised electrification and district heating, providing low grade heat <100°C, and also providing medium grade heat at 100°C – 200°C. At the higher scale of industrial heat demand technologies required might be bespoke electrification.

This bespoke electrification could materialise as Mechanical Vapour Recompression (MVR) technology which can provide heat up to 80°C – 200°C. Electric or electrode boilers can provide up to 350°C, with direct electric firing up to 800°C. Electric arc furnaces can provide up to 1200°C, and indirect electric heating with hydrogen via electrolysis is also an option. There are fuels such H2 and biofuels, providing heat in ranges of 200°C - 500°C.

Renewable energy systems with a variable energy production should include technologies that act to balance these variables. The development in industrial electric heat has to be seen as a policy to compliment and aid the growth in overall renewable energy and cannot be policies developed in isolation. A recent study has found *"that direct electrification of industrial process heat demands should be favoured"* and this is also *"due to the lower costs of the energy system and a higher energy system efficiency with direct electrification."*[5].

[4] CRU's Electricity Network Tariff Structure Review, 2021

[5] Electrification of the industrial sector in 100% renewable energy scenarios, Aalborg University, May 2022.

8. Are the measures that can be taken to assist businesses sustain the additional operating costs associated with moving to new, low-carbon technology?

Electric heat offers an economically viable heating alternative to fossil fuels that is low carbon and sustainable. Addressing the many costs involved in electricity could be addressed to incentivise the growth of low carbon electric heat. Electricity costs can be addressed looking at the current tariff structure. Consideration should be provided for the flexibility of industrial heat pumps and looking at for example removing supplier charges.

Build Environment

Consultation Questions

1. Currently SEAI provides approx. 50% of the grant of retrofit to Landlords, Housing for All commits to introducing a minimum BER for rented properties from 2025 onwards. What further supports can be put in place to address the split incentive when retrofitting rental properties (residential and commercial)?

Polices on retrofitting schemes must be seen alongside and in tandem with policies on the decarbonisation of heat. The aim of retrofitting is the reduction in usage which is dominated by fossil fuels heating. But with the development of electric heat will provide a long-term solution to fully decarbonise our heating sector.

2. How can we encourage SMEs to upgrade the energy efficiency of the buildings they own?

The development of electric heat is an efficient, and economic means of generating heat for the SME sector. Any upgrade for the building stock must consider the electrification of heat and its long-term benefits. There are many examples where the SME sector across Europe has made the move to the electrification of heat. A specific case study example of an office building with a heat pump with 357 KW, was supplying 75°C. A further example is of a supermarket using electrification for heating and cooling at 743KW with a supply temperature of 80°C.

Public Sector Leading by Example

Consultation Questions

1. What opportunities exist for the public sector to step up its climate ambition?

The Climate Action Plan 2021, outlines that "*Public bodies' Climate Action Roadmaps will target at least a 50% overall contribution from renewable space heating...by 2030*". Considering the benefits of decarbonising heat through electrification this ambition could be enhanced. We mention previously also the broad benefits of the electrification of heat in the public sector giving economic benefits to the public sector while reducing emissions.

3. How can the public sector lead wider society to change? In the short-term, medium-term, long-term?

The public sector is in a significant position to lead in terms of low carbon electric heat. There is potential in the decarbonisation of public buildings through industrial heat pumps with examples across the EU such as a hospital with a capacity of 1380KW and a supply temperature of 70°C, a university with 743KW suppling 80°C and a fire station with 401KW and supplying 80°C.