DEPARTMENT OF COMMUNICATIONS, CLIMATE ACTION AND ENVIRONMENT

SSE RESPONSE TO

PUBLIC CONSULTATION TO INFORM A POLICY FRAMEWORK FOR THE DEVELOPMENT OF DISTRICT HEATING IN IRELAND

FEBRUARY 2020

EXECUTIVE SUMMARY

District heating is estimated to account for less than 1% of heat in Ireland, representing one of the lowest shares of district heating in Europe. The Climate Action Plan commits to developing a policy framework for the development of district heating in Ireland which we support. District Heating can play a key role in improving energy efficiency and reducing emissions. Given that end-users are supplied with heat rather than fuel (gas, heating oil, etc.), district heating networks offer the flexibility to adapt to changes in the economic and policy landscape, that may see different combinations of energy resources used at different times over the lifetime of a district heating network.

The Climate Action Plan outlines a key role for renewable electricity to drive the decarbonisation of the Irish economy with plans to electrify heat and transport with 1 million electric vehicles and 500,000 heat pumps planned. Ireland has a diverse housing stock. District Heating can play an important role in dense, urban areas where there is a heat source nearby that can be utilised. Often district heat is seen as an enabling technology for the electrification of heat, where waste heat increases the uptake of high efficiency heat pump solutions and allows them to operate with greater flexibility, putting less strain on the local electricity network.

District Heating is well established globally. Ireland therefore has an ideal opportunity to apply lessons learned from other jurisdictions to ensure the policy and regulatory framework adopted facilitates the growth of district heating.

SSE's distributed heat division - SSE Enterprise - has been delivering heating and cooling to residential and commercial properties for 11 years in the GB market. We provide an end-to-end (design, develop, own, operate) heating and cooling network service for an ever-expanding portfolio of projects. We currently own and operate 19 district heating systems across GB. When operating these schemes we take on full Energy Services Company (ESCo) responsibility for the management of the infrastructure as well as the customer service and billing. In total we serve approximately 9,000 residential customers connected to heat networks. This will rise to over 21,000 when all current networks are complete.

We look forward to bringing our expertise in this area to the Irish market and contributing to the development of a policy and regulatory framework for district heat through this consultation.

Our key recommendations are:

- Local authorities will need to play a key role in enabling the development of district heating. Planning at local authority level to identify possible opportunities and the early development of network design will be key drivers.
- Given the relatively high capital costs involved and nascent nature of district heating in Ireland, we believe some degree of Government support or funding will be required to drive investment in district heating networks in Ireland.
- We recommend Local Authorities harness the expertise of district heat industry players through competitive tendering for private investment partners to jointly develop and own projects.
- We believe a public-private JV SPV is the most appropriate model for large scale DH schemes, as it allows the private sector to bring development experience and resource to the project, whilst ensuring public sector involvement and diversification of risk and capital exposure.
- Competition should be promoted across all aspects of district heat from construction to ownership and operation. We believe both public ownership, private ownership or a mix of the two should be possible. Ireland's regulatory framework should be developed to enable these models.

- We believe there could be a role for all of the funding mechanisms mentioned in the consultation draft. The appropriateness of a funding mechanism will depend on the particularities of a District Heating scheme's goals and risk profile.
- It is vitally important that Technical Guidelines and a Voluntary Code of Practice for consumer protection are established. We recommend the Department establish a Working Group to examine this matter with representatives from the Irish District Energy Association (IrDEA).
- Education and awareness are crucially important. It is important that proposed plans for district heat networks are accompanied by clear and widely publicised information campaigns explaining the rationale and benefits of district heating.
- Strong carbon pricing will be a fundamental enabler for low-carbon District Heating. We welcome the trajectory outlined for non-ETS Carbon Tax in the Climate Action Plan. We recommend revenues raised be used to support the uptake and development of low-carbon heating solutions like District Heating.

We outline our response to the consultation questions below.

Response to Consultation Questions

Research

Q1: What additional research do you think needs to be carried out to support the development of district heating in Ireland?

District Heating is well established across Europe. There is a wealth of research and insights that can be drawn upon. Research commissioned with a focus on the Irish market should be careful not to duplicate what already exists. We believe it is important there is sufficient research and analysis available to enable Ireland to proceed though we would highlight the following for consideration:

- The Energy Efficiency Directive requires Member States to update their Comprehensive Assessment every five years. In April 2019, the Commission requested an updated Comprehensive Assessment from Ireland, to be notified by December 2020. This crucial piece of research needs to be progressed and concluded this year to allow for the market to become established.

- We recommend the consolidation of performance data for Ireland's existing district and communal heating schemes. It would also be useful to better understand consumer attitudes in relation to the heat networks that currently in existence in Ireland. This could help inform the development of a consumer protection framework.

- Research is also needed to gain a better understanding of the many benefits District Heat can provide in an Irish context such as the capability for large scale demand side response utilising CHP, heat pumps, electric boilers and thermal storage capabilities.

Q2: How should research (including the upcoming comprehensive assessment) be used to inform/support the development of district heating in Ireland?

Education and public awareness are crucially important. At present, district heating is an unknown technology to the majority of people and businesses in Ireland. It is important that proposed plans for

district heat networks are accompanied by clear information and an explanation of the benefits. Research supporting urban master planning and heat mapping would also be beneficial.

Q3: Are there relevant existing research projects into district heating, in the Irish context, which are not referenced in this document?

A good summary has been provided in the consultation and in the response provided by the Irish District Energy Association (IrDEA). SSE is not aware of other Irish specific research projects.

Q4: Can further research contribute to encouraging areas of compact urban growth to develop district heating projects?

Compact growth is a key policy coming from the National Planning Framework (NPF) and the Regional Strategies now in place. Local authorities are obliged to adopt sustainable development practices which we welcome. Compact urban growth is a key step in ensuring the feasibility of District Heat systems, as the more compact an urban area, the less network infrastructure is required to connect those buildings to the network and the lower the cost.

Regulation

We believe that the way Ireland classifies waste heat needs to be reconsidered from a policy and regulatory perspective. Ireland has an opportunity with the transposition of the recast Renewable Energy Directive 2018/2001 to adopt a world class regulatory environment for the roll out of district heating. Under Article 23 of the recast Renewable Energy Directive Ireland has an obligation to increase the share of renewable energy supplied for heating and cooling by an indicative 1.3% as a yearly average for the periods 2021-2025 and 2026-2030 (Art 23(1)). The legislation allows for up to 40% of this increase to be met by waste heat.

The way in which Ireland currently implements Article 5 of the Renewable Energy Directive/28/EC 2009 and the methodologies therein need to be reviewed as part of the transposition of the new Directive. The accounting of waste heat as a renewable energy source in meeting climate targets is undervalued by the methodology currently utilised in Ireland. Member States do however have the scope to adopt different methodologies to that outlined in Directive/28/EC if it will result '*in a significantly improved estimate of renewable energy from heat pumps'*.

Clause 3.12 of the Commission Decision 2013/114/EU [1] outlines the following:

"*It is envisaged and encouraged that Member States do their own estimations for both SPF[2] and H HP[3]. If improved estimations can be made, such national/regional approaches should be based on accurate assumptions, representative samples of sufficient size, resulting in a significantly improved estimate of renewable energy from heat pumps compared to the estimate obtained through the use of the method set out in this Decision. Such improved methodologies may be based on detailed calculation based on technical data taking into account, among other factors, year of installation, quality of installation, compressor type, operation mode, heat distribution system, bivalence point and the regional climate.*"

[1] Commission Decision 2013/114/EU of 1 March 2013 establishing the guidelines for Member States on calculating renewable energy from heat pumps from different heat pump technologies pursuant to Article 5 of Directive 2009/28/EC

[2] Seasonal Performance Factor

[3] Annual equivalent heat pump hours' (H_{HP}) means the assumed annual number of hours a heat pump has to provide heat at rated capacity to deliver the total usable heat delivered by heat pumps, expressed in h

Ireland has an opportunity with the transposition of the recast Renewable Energy Directive 2018/2001 to adopt an approach which properly takes account of the value of waste heat in meeting climate targets and does not lead to perverse outcomes.

Q5: What elements of Article 24 of the recast Renewable Energy Directive should be implemented in the near term (i.e. by the mid-2021 transposition deadline)?

The percentage contribution of District Heating to overall heat & cooling demand in Ireland is unlikely to meet the target of 2% in the short term. We agree with the sentiments expressed in the consultation document that introducing regulation such as this which is aimed at existing large District Heat markets could hinder the development of a district heating market in Ireland.

Q6: What elements of the Article 24 of the recast Renewable Energy Directive should be implemented in the medium term (i.e., by 2025)?

This should depend on the extent to which the District Heat industry develops in Ireland over next five years. While we support the provisions contained in Article 24, they will need to be carefully considered and implemented. For example, in relation to the right to disconnect, while we support this policy, a number of issues need to be considered such as what alternatives should be offered and whether a more carbon-intensive alternative should be permitted.

Q7: Who should have the right to own the district heating networks?

When considering the question of ownership of district heating networks, it is important to note that there are numerous models available. These range from owned and operated by the same entity, owned by one entity but operated by a different entity to “build and transfer”, concession or Joint Venture models. Typically, whichever ownership model is selected, the scheme will be delivered using a special purpose vehicle(s) (SPV) to develop, own and operate the scheme.

We recognise that district heating networks demonstrate natural monopoly characteristics. We do not believe, however, that this should necessarily preclude private sector ownership or hybrid public/private ownership models. We believe the benefits of competition should be harnessed to ensure investments in District Heat in Ireland are an attractive commercial proposition. Opportunities to construct, own and operate should be tendered on a competitive basis.

Q8: Should there be a district heating market regulator?

District Heating is in the early stages of development in Ireland. When considering regulatory requirements, a balance needs to be struck to ensure that industry is not over-burdened with requirements which could dampen future investment. Therefore, we consider that initially at least a voluntary Code of Practice should be developed and promoted, akin to the work undertaken by the Heat Trust in the UK. We recommend the Department establish a Working Group to examine this matter with representatives from the Irish District Energy Association (IrDEA).

Once the market has become more established, we believe this issue should be revisited to determine whether more formal regulatory structures need to be put in place.

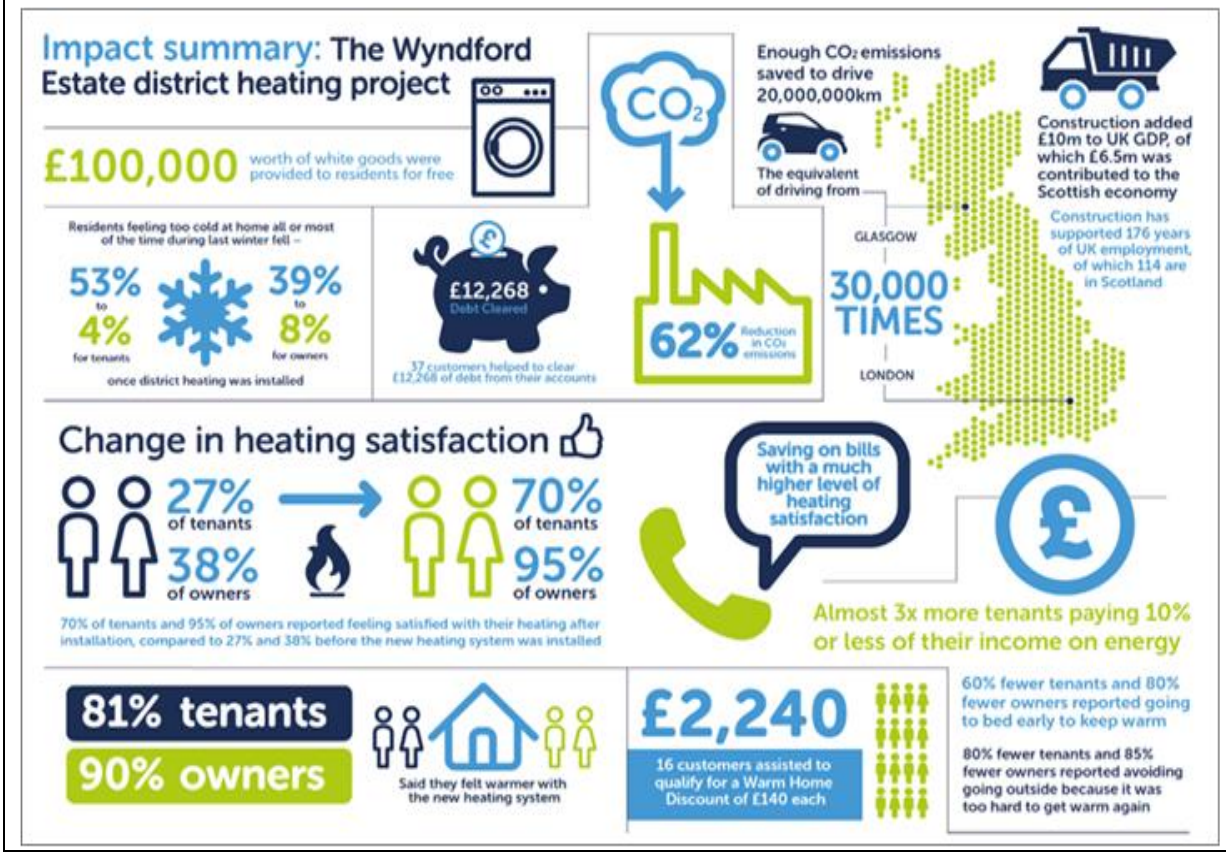
CASE STUDY - WYNDFORD ESTATE, GLASGOW

The Wyndford Estate is an example of where compact urban growth allowed SSE Enterprise to retrofit a district heating scheme to a site. SSE Enterprise was selected to act as the design and build contractor, before adopting the district heating asset under an ESCo partnership agreement with the developer, a housing association. The network has won an Association for Distributed Energy (ADE) award for the impact it has had on the community and its role in reducing fuel poverty on the estate.

The design and installation involved a complex retrofit project supplying 1,527 tenanted properties and a further 250 privately owned units. The heat network replaced old electric storage heaters which had been consistently failing across the site. The financing structure combined a UK Government grant, capital funding from the housing association (Cube Housing) and capital investment from SSE.

Cube and SSE Enterprise developed heat tariffs which were clear, transparent, and most importantly, would mean that tenants would spend less on heating their homes following the installation of the new DH system.

SSE Enterprise carried out a socio-economic impact study at Wyndford a year after the system had been installed to see whether the predicted benefits of the system were borne out in practice by tenants' experience. The results from this survey, together with those from an independent "Heat and the City" study into the wider impacts of the district heating project, are presented as an info-graphic below.



Q9: Should there be guidelines/Code of Practice around district heating and if so, who should be responsible for their development and implementation?

As we outlined above, it is vitally important that Technical Guidelines are established in regard to projects at all stages of the process from feasibility, design and procurement to construction, operation and maintenance. This was absent from the UK market in the early stages and was not introduced until 2015 with the CIBSE/ADE Code of Practice (CP1) for heat networks. We believe the absence of Technical Guidelines has been an issue for the UK market and that this is a key learning for the Irish market. The set-up of a voluntary consumer protection scheme by 'The Heat Trust' has been a positive step for the UK market and we believe a similar Code of Practice for consumer protection should also be developed for the Irish market, in particular noting that the Irish market is very much in its infancy. Competitive tenders should stipulate adherence with these Codes of Practice as has been the case with the Heat Trust approach in the UK.

Planning

Q10: What changes, if any, are required to existing planning and building regulations in order to support the development of district heating? In particular what changes might be required in order to promote the type of high-density development that is seen as providing the most suitable conditions for development of district heating?

The National Planning Framework (NPF) contains a strong emphasis on compact growth, environmental management and climate action. Activating strategies to achieve effective density and consolidation, rather than more sprawl of urban development is considered a top priority of the NPF. We hope that the new process of Regional Spatial and Economic Strategies will help drive this outcome. We believe it is essential that Regional Assemblies and the Office of the Planning Regulator, if required, play an active monitoring role to ensure local authority planning adheres to the objectives of NPF.

A successful policy across Europe has been the advent of district heating zones. Requiring local authorities to assess and define specific 'Heat Zones' could be a useful tool to ensure a strategic approach to energy planning and to provide scale and "pipeline" visibility of related projects. We believe this model should be considered once the industry becomes more established in Ireland. This approach could be trialled in the first instance in Dublin or one of Ireland's cities or big towns. 'Heating zones' have the potential to identify the most efficient heat solution per area and ensure a "joined up" approach to enable an overarching view.

Within these zones, planning authorities could also better support District Heating by applying planning conditions such as considering whether strategically located developments (e.g. certain public buildings) be required to connect to district heating where commercially viable and appropriate. This has been adopted successfully in cities like London. These types of planning requirements have already been used and trialled in Dublin City scheme development and are important to help de-risk and lay the foundations for future District Heat development. These practices should be considered by all local authorities, starting with large, dense urban areas.

Q11: Is there potential for the revised building Regulations to act as a driver for district heating?

Building regulations undervalue the contribution waste heat makes to climate targets. We believe this needs to be rectified. Currently the requirements for new dwellings, under Part L, require an energy performance (the EPC), carbon performance (the CPC) and renewable energy (the RER) target to be met. There are challenges with having a carbon coefficient and a separate renewable energy requirement when utilising waste heat. Waste heat is not classified as renewable but is low-carbon as it has no fuel associated with producing it as it is a waste product of a primary process.

A dwelling which is supplied by a District Heat scheme utilising waste heat will meet the energy efficiency and carbon requirements, but will not meet the renewable energy element. This means that there could a near zero-carbon home, but it will still require an investment in an on-site renewable technology to meet the RER threshold. This undervalues the contribution waste heat makes to climate targets as we outline above and could push up the costs of a district heat project. We believe this requirement should be reviewed in relation to District Heat projects.

Q12: Given the importance of the public sector taking a lead role in developing district heating in Ireland, as highlighted in the 2015 Comprehensive Assessment, what, if any, additional powers are required by local authorities in order to ensure they have the necessary vires to develop and operate district heating networks?

Local authorities will need to play a key role in enabling the development of district heating. Local authority planning to identify possible opportunities and the early development of DH network design will be key drivers. We recommend Local authorities harness the expertise of district heat industry players through competitive tendering for private investment partners to jointly own and develop projects. SSE has partnered with Local Authorities on a range of projects to date and we look forward to opportunities emerging in the District Heat space.

Q13: What sources of financing are currently available to the Irish district heating market?

Given the relatively high capital costs involved and nascent nature of the district heating in Ireland, we believe some degree of Government support/funding is required to drive investment in district heating networks in Ireland. It is our view that a blend of public and private financing and ownership will be required to drive investment in district heating in Ireland. SSE favour a public-private sector ownership model (or joint venture) as it can bring together the relative strengths of each sector.

In order to unlock investment potential and ensure Ireland is an attractive district heat market, capable of competing globally, it is essential to ensure a proportionate policy and regulatory framework. There needs to be sufficient flexibility to pursue business models which best meet the characteristics and risk profile of individual projects.

Q14: What are the most appropriate financing mechanisms for developing district heating in Ireland?

We believe the consultation has summarised the possible financing mechanisms well. We believe there is a role for all of these funding mechanisms. It should be noted that some projects will require a blend of different financing mechanisms. Each scheme and each phase of development will come

with a different risk profile, which different businesses will value differently based on their ability to control and manage that risk.

If ownership of networks remains open to both the public and private sector, then the market will innovate over time, and the sector will see a number of enterprising financial models that allow for a wide array of investors; ultimately encouraging growth of a low carbon economy, allowing low carbon business to thrive and areas to develop and grow.

Q15: What are the most appropriate business delivery models for the Irish context?

All are appropriate dependent on the scheme's goals and risk profiles. It is essential that the door is not closed on these models at an early stage in the industry's development as this may stagnate development and reduce investment in the sector.

As we have outlined, we believe a public-private Joint Venture SPV is the most appropriate for large scale district heat schemes. We believe this utilises the strengths of both respective entities. Public sector businesses bring a lower cost of capital, strategic relationships and a focus to 'serve' the residents and businesses connecting to the network. The private sector will encourage rapid development and investment in the market, bringing development and operational expertise from across the UK and Europe. Together both will diversify the risk and capital expenditure

Q16: In addition to those listed above, what are the other main challenges to raising non-exchequer financing for district heating projects in Ireland? What measures should Government consider putting in place in order to mitigate these challenges?

The consultation document has summarised the main challenges well. Principally district heat struggles to obtain investment due to large upfront capital costs and slow build out of the networks, where revenue is generated (primarily) from sale of heat to consumers. Successful networks are often based off key 'anchor' heat loads which provide day one consumption and revenue for the investor. Uncertainty over the extent to which consumers will connect to the network is also a barrier.

Other key issues are a lack of skills, knowledge and experience in the market; especially in design and build of heating and cooling networks. In the UK, until the advent of the CIBSE Code of Practice (CP1) for heat networks, systems were significantly over-sized, which led to higher capital costs and poor operational performance in some instances. This created uncertainty in market and reduced efficiencies.

Q17: Other than providing direct exchequer funding, what incentives might Government consider implementing in order to drive the development of district heating? For example, should major energy users be allowed to offset their carbon taxes on energy demand by supplying waste heat to local communities?

Strong carbon pricing is essential. Putting a value on greenhouse gas emissions that aims to reflect the costs to society of climate change from those emissions will continue to be required. A fundamental enabler for District Heating, along with all other low-carbon heating solutions, is to ensure carbon pricing adequately reflects the cost of emissions to society and stimulates low-carbon investment. We welcome the trajectory outlined for non-ETS Carbon Tax in the Climate Action Plan. We also welcome the commitment to ensure revenues raised through the increase in non-ETS Carbon Tax be allocated to promote energy efficiency and climate action. We recommend revenues raised also be used to

support the uptake and development of low-carbon heating solutions like District Heating. Affordability for consumers.

CONCLUSION

SSE is available to discuss any aspect of this submission further, should that be helpful to the Department.

ABOUT SSE

At SSE, we are committed to playing our part in ensuring society realises the ambition of the Paris Climate Agreement to bring net greenhouse gas emissions down to zero. Since 2008, SSE has invested over €2.5 billion in growing our energy business here – creating jobs in Ireland, sustaining employment, driving competition and greening our economy. Our 29 onshore wind farms have a combined generation capacity of 740MW, making us the largest generator and provider of renewable energy in the integrated all-island Single Electricity Market. As a leading developer and operator of offshore wind energy in Great Britain, we believe offshore wind has the potential to transform Ireland's ability to respond to climate change. SSE is currently progressing the development of Arklow Bank Wind Park – Phase 2 off the coast of Arklow, Co. Wicklow.

SSE's distributed heat division - SSE Enterprise - has been delivering heat and cooling to residential and commercial properties for 11 years in the GB market. We provide an end-to-end (design, develop, own, operate) heating and cooling network service for an ever-expanding portfolio of projects. We currently own and operate 19 district heating systems across GB. When operating these schemes we take on full Energy Services Company (ESCo) responsibility for the management of the infrastructure as well as the customer service and billing. In total we serve approximately 9,000 residential customers connected to heat networks, this will rise to over 21,000 when all current networks are complete.