District Heating – Consultation to Inform a Policy Framework for the Development of District Heating in Ireland

Department of Communications, Climate Action and Environment

Gas Networks Ireland and Ervia Response

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Part of ervia group

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1 Introduction

Ervia and Gas Networks Ireland (GNI) are submitting a joint response to this consultation and very much welcome the opportunity to respond to the Department's[1] District Heating Consultation to Inform a Policy Framework for the Development of District Heating in Ireland.

Ervia is a commercial semi-state company with responsibility for the delivery of gas and water infrastructure and services in Ireland, through GNI and Irish Water. It also provides dark fibre broadband infrastructure through its business Aurora Telecom.

GNI owns, operates, builds and maintains the gas network in Ireland and ensures the safe and reliable delivery of gas to its customers. The company is responsible for transporting natural gas through 14,390km of pipeline networks. GNI operates one of the most modern and safe gas networks in the world and ensures that over 700,000 customers, including businesses, domestic users and power stations receive a safe, efficient and secure supply of natural gas, 24 hours a day, 365 days a year. GNI believes that gas and the gas network are integral to Ireland's energy system because for example gas is used to produce circa 50% of Ireland's electricity.

District heating has been used to heat towns and cities in Europe for over 80 years but Ireland has one of the lowest shares of district heating in Europe with less than 1% of the heat market being supplied by district heating[2]. District heating can be very beneficial where waste heat is used to meet consumers' needs.

2 Consultation Questions

2.1 Research

Question 1: What additional research do you think needs to be carried out to support the development of district heating in Ireland?

GNI and Ervia recommend that further research is carried out into a potential role of biomethane[3], generated from waste, in district heating. RED II certified biomethane[4] delivered via the gas grid can be used in district heating schemes. GNI and Ervia believe this solution has significant potential to be a pathway to meeting Ireland's RES-H targets. Waste streams may be converted to biomethane at one location, where waste streams are available, and delivered via the gas grid to another location where there is the heat demand density necessary for district heating. The gas grid is used to connect the two locations making district heating feasible in many locations, with high density of heat demand but no source of waste heat.

Using the gas grid effectively builds in back-up via natural gas in the event biomethane is not available. This also future proofs district heating schemes as it allows for other renewable gases such as green

[1] Department of Communications, Climate Action and Environment
[2] https://www.seai.ie/publications/2016_RDD_79._Guide_District_Heating_Irl_-_CODEMA.pdf
[3] Biomethane: https://www.gasnetworks.ie/corporate/company/our-commitment/environment/renewable-gas/
[4] Under the recast Renewable Energy Directive (RED II), biomethane must meet certain sustainability criteria to be considered renewable energy.

hydrogen[5] to be used in the future. This solution is particularly relevant for Ireland as the EU have concluded that Ireland has one of the highest potentials for biomethane in the EU[6].

A total systems cost approach or cost of abatement analysis should be carried out to compare different heating systems and to inform policy in relation to district heating. For example, in towns or streets that are already connected to the gas grid or close to the gas grid, it may be more cost effective to decarbonise residential heating by the use of biomethane and/or hydrogen in the future as opposed to building a new district heating scheme. A renewable gas approach could deliver emissions reductions with minimal disruption for the end user, while taking advantage of the existing gas network.

Research should look at understanding the heat needs in particular locations and include a comparison of district heating alternatives. While district heating can be very beneficial, it won't be able to cover all thermal heat requirements and therefore due consideration should be given to all heating requirements when assessing an area's suitability for a district heating scheme. The gas network can cover a broader spectrum of heating applications, and meeting consumers' needs must be taken into consideration when installing heating systems.

Question 2: How should research (including the upcoming comprehensive assessment) be used to inform/support the development of district heating in Ireland?

Research into available waste streams suitable for district heating should be included in the updated comprehensive assessment. GNI and Ervia agree that a geographical quantitative assessment of heat demand and supply in Ireland would be a useful tool for developing district heating in this country. GNI and Ervia support the development of heat-maps under the Heat Roadmap Europe research initiative for Ireland. These heats maps will identify and assist in zoning prospective heat supply locations and heat demand districts. As discussed above, any urban area identified which has the required heat demand density can be connected to a prospective waste heat supply source via the gas grid.

Question 3: Are there relevant existing research projects into district heating, in the Irish context, which are not referenced in this document?

GNI and Ervia participated in a feasibility study[7] into a district heating network with Cork City Council and Energy Cork to be implemented as part of the Cork Docklands re-development in Cork. While the project indicated at the time that there would be a number of energy strategy benefits (including increasing the overall sustainability of the docklands) if it were to proceed, it did not proceed due to the economic downturn. A number of variables have changed since the report was published in 2009 but it is our understanding that Cork County Council and Energy Cork are reviewing this project again.

This project had a number of advantages as the district heating pipeline network could be installed in conjunction with the construction of roads. New buildings in the development could be constructed to be district heating ready. This project also had the benefit that the heat load would be a mixture of domestic heating and commercial and would provide a year round demand for the district heating system.

[5] Green hydrogen is defined as hydrogen produced from renewable energy sources.
[6] EC - Optimal use of biogas from waste streams: https://ec.europa.eu/energy/sites/ener/files/documents/ce_delft_3g84_biogas_beyond_2020_final_report.pdf
[7] Cork Docklands High Level District Heating Feasibility Study: http://sp1ral.corkcity.ie/services/strategicplanningeconomicdevelopment/docklands/sustainability/districtheatingfeasibilitystudy/District%20Heating%20Feasibility%20Study.pdf

Question 4: Can further research contribute to encouraging areas of compact urban growth to develop district heating projects?

Research will continue to play an important part in the development of district heating as an option in Ireland. Further research should also include detailed cost benefit analysis into potential district heating projects.

2.2 Regulation

Question 5: 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)?

All elements of Article 24 of the Renewable Energy Directive, which focuses on district heating and cooling, are sensible and are required to give consumers confidence in the proper regulation and management of their district heating system. GNI and Ervia support provision of all information to consumers to allow them to make informed choices. In addition to information on the share of renewable electricity used in district heating schemes, information on the share of renewable gas should also be made available where applicable. See the response to question 1 above for more information on the potential for renewable gas in district heating.

GNI and Ervia accept that for practical reasons the implementation of all elements of Article 24 may be on a phased basis. If it is decided that some elements are not implemented initially, to ensure consumer confidence, a commitment should be made on a date for subsequent full implementation.

Question 6: What elements of the Article 24 of the recast Renewable Energy Directive should be implemented in the medium term (i.e., by 2025)?

As above GNI and Ervia recommend that if some elements are not implemented initially, a commitment should be made with regard to a date for subsequent full implementation.

Question 7: Who should have the right to own the district heating networks?

There are a number of district heating ownership models in the EU. These vary from municipal owned district heating utilities to large public private partnership models. Whatever model is used the key requirement is that district heating assets are easily financeable.

Based on GNI and Ervia experience with gas and water utilities in Ireland, having the assets owned by a commercial semi-state has a number of advantages. It makes regulation of the district heating networks streamlined and transparent. This regulated model typically provides certainty for investors and therefore allows access to lower cost finance, thus delivering savings for consumers.

Therefore GNI and Ervia believe that the district heating transmission and distribution systems should be in semi-state ownership. To ensure a national district heating network is maintained to the standards required and attracts the required level of investment, it should be run as a national utility. This does not exclude potential options for joint ventures with local authorities where appropriate.

The Irish Government is bringing forward a Just Transition Fund and the European Green Deal has identified a Just Transition as a key pillar of its Climate Neutral by 2050 agenda. There may be potential in the Just Transition Fund for companies such as GNI who are in the process of decarbonising the gas network to play a part.

Question 8: Should there be a district heating market regulator?

Yes, similar to other European countries[8], Ireland should have a regulator for district heating schemes. A regulator would protect the interests of district heating customers as well as both the safety and commercial regulatory aspects of district heating schemes.

Question 9: Should there be guidelines/Code of Practice around district heating and if so, who should be responsible for their development and implementation?

Yes, there are multiple codes of practice for district heating systems published by industry bodies such as CIBSE[9]. Absent a regulatory regime, progressing a district heating development in compliance with industry best practice is voluntary.

GNI and Ervia suggest that if an infrastructure and market regulated model for district heating networks is adopted similar to the gas and electricity networks, then it is logical that the identification of and compliance with industry best practice becomes part of this regulatory framework.

2.3 Planning

Question 10: 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?

No response.

Question 11: Is there potential for the revised Building Regulations to act as a driver for district heating?

No response.

Question 12: 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?

No response.

2.4 Financing

Question 13: What sources of financing are currently available to the Irish district heating market?

The appetite for investors to fund district heating projects in Ireland, and indeed in all jurisdictions is directly related to the investors' confidence that projected revenues will materialise. It is likely district heating projects will need to be completed in phases. The later phases should be easier to finance than earlier ones, provided expected returns are realised in the earlier phases.

The sources of finance will depend on the business model(s) selected and will likely be a mixture of equity and debt. The cost of finance will be directly related to the risks associated with the projected revenues and how these risks are mitigated.

[8] Climate X Change - Lessons from European regulation and practice for Scottish district heating regulation: https://www.climatexchange.org.uk/media/3569/lessons-from-european-district-heating-regulation.pdf

[9] CP1 - Heat Networks: Code of Practice for the UK: https://www.cibse.org/knowledge/knowledge-items/detail?id=a0q200000090MYHAA2

Question 14: What are the most appropriate financing mechanisms for developing district heating in Ireland?

There are a number of funding mechanisms available for district heating networks from 100% equity /balance sheet to 100% non-recourse debt financing. As with all projects the main risk is that the projected revenues on which the business case for the project is based, do not materialise.

GNI and Ervia suggest that the most appropriate mechanism, and one which would deliver the lowest cost of finance, and therefore lowest cost for consumers would be a mixture of equity and debt underpinned by a stable regulatory regime. This is the financing model which already works successfully in the Irish gas and electricity networks.

Question 15: What are the most appropriate business delivery models for the Irish context?

The operation of a district heating network in Ireland will be very similar to the operation of existing gas, electricity and water infrastructure. For this reason GNI and Ervia suggest that the most appropriate business model is one based on the existing business models for these networks, with an infrastructure element and a supply element.

As with energy networks, when markets are initially small these two elements may be integrated, while the market is below a certain number of customers or for a given time period.

In this business delivery model:

- The infrastructure provider will own and operate the asset and get a return on investment plus opex; and
- The supplier will use the infrastructure to supply heat to end users.

Question 16: 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?

As discussed above the main challenges relate to raising finance and the cost of this finance. These challenges are directly related to the projected revenue and the risks associated with this revenue.

GNI and Ervia have extensive experience in developing and financing energy networks i.e. the gas pipeline infrastructure. Developing energy networks based primarily on temperature sensitive/seasonal loads is very challenging. GNI and Ervia mitigate and offset this by developing projects which have both a temperature sensitive and a year round base load.

The Government could consider incentives for industrial and commercial premises with year round heating and process loads to convert to district heating. GNI and Ervia have identified an opportunity with regard to the Ringsend Waste Water Treatment Plant (WWTP) that could form part of the Dublin District Heating Scheme which is described in the Climate Action Plan. A year round heat demand, the Ringsend WWTP is located beside the waste heat source, the Kovanta Waste to Energy (WtE) facility.

The Ringsend WWTP currently generates both heat and electricity via biogas fired combined heat and power (CHP). Instead of using this in the CHP this biogas could be upgraded and injected into the gas grid and used in the transport sector. The heat demand could be met from the Kovanta WtE plant increasing the CHP efficiency of the Kovanta WtE plant. The WWTP CHP plant is still available to back-up the WWTP and also the district heating network, further reducing district heating system capex.

The Government could promote projects which incorporate this type of “joined up” circular economy thinking, reducing waste, minimising capex and capturing benefits across multiple sectors.

These circular economy type projects, crossing multiple sectors with multiple stakeholders will only be possible with strong government support and encouragement.

Question 17: 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?

The Government should consider, and implement, a range of incentives particularly in the early phases of district heating developments. Offsetting of carbon taxes for waste heat fuelled district heating is one such measure. Another possible measure is increased and accelerated capital allowances for companies' investment in district heating infrastructure.

3 Conclusion

GNI and Ervia ask that the Department considers the role that GNI and biomethane can play in the development of district heating schemes. GNI and Ervia would welcome the opportunity to discuss this response in more detail and can provide further information on any of the topics discussed.