Submission to the Public Consultation to

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

Report prepared by The Irish District Energy Association

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Introduction

The Irish District Energy Association (IrDEA) was founded in 2017 and its purpose is to promote the development of low-carbon District Heating & Cooling (DHC) in Ireland. IrDEA currently represents 23 members from a variety of sectors from consultancy and technology providers, to the public sector and academia. It is the only association in Ireland dedicated to supporting the DHC industry.

Countries across Europe with similar climates, populations, and energy systems to Ireland have proven that district energy can deliver sustainable and cost-effective heating to urban areas serving millions of people. However, there is currently a shortage of knowledge, policy support, capacity, standards and regulations in Ireland to facilitate the implementation of large-scale district energy networks. IrDEA's objective is to overcome these barriers by informing key stakeholders in Ireland about all aspects of district energy.

General Comments

IrDEA welcomes the opportunity to input into this consultation process, and we are happy to see the DCCAE following up on this District Heating (DH) Policy Framework action that formed part of the Energy White Paper in 2015. Policy is key to support the development of district energy, as has been shown in other markets across Europe where DHC supplies the majority of low-carbon heat to cities and towns.

Why District Heating & Cooling?

One of the largest energy uses in urban areas is demand for heat. Energy efficiency upgrades reduce this demand but only to a certain extent, and retrofitting to near-zero energy buildings is not feasible for most building owners and building uses. Implementing low-carbon heat solutions is a huge challenge as it requires changes to each individual building, unlike implementing low-carbon electrical generation, which can be produced anywhere at scale and delivered to each building through the network.

District heating networks offer this solution for the heating sector in towns and cities; low-cost, low-carbon and renewable heat can be produced at scale and delivered to buildings through the network. In fact, zero-carbon heat is already being produced at scale in power generation and large industrial units across the country, and is thrown away as a by-product through exhaust stacks and water cooling systems. District heating needs to be considered as one of the key ways to decarbonise the heating sector of towns and cities across Ireland, and form part of a national heat plan. DH networks which utilise waste and renewable heat will result in significant reductions in carbon emissions without major retrofitting being required for older existing building stock, this is one of the advantages of DH when compared with individual building heat pumps. In addition,

any future improvements made the building through deep retrofitting will also improve the efficiency of the DH network by reducing the temperature requirement.

Flexibility for Heating

District heating is an enabling technology, since it connects central heat suppliers to individual heat consumers: similar to the electricity grid connecting power plants to individual homes. Since water is the delivery medium, district heating can use a wide variety of heat supplies including excess heat (which can come from power plants, data centres, waste incineration, and industry) and large-scale renewables such as solar thermal, deep geothermal, heat pumps, and electric boilers. This makes district heating very flexible i.e. it can use a variety of different heat supplies to meet the same heat demand. This will be essential as Ireland transitions towards more renewable energy.

For example, Figure 1 below shows how Denmark has varied the fuel supply to its district heating over the last 40 years. If individual solutions are implemented instead, then the flexibility of the heating sector will be reduced significantly. It is much easier and cheaper to change a central heat supply than changing the individual heat supply in every home. For example, biomass has increased a lot in recent years in Denmark's heat supply since the district heating plants are simply switching from coal to biomass (see Figure 1), while new forms of renewable energy are also being introduced such as large-scale solar thermal (Denmark has some of the largest solar thermal farms in Europe). If individual solutions are implemented, then this change will take much longer and be more expensive, since each individual would need to make the change rather than just one central plant.

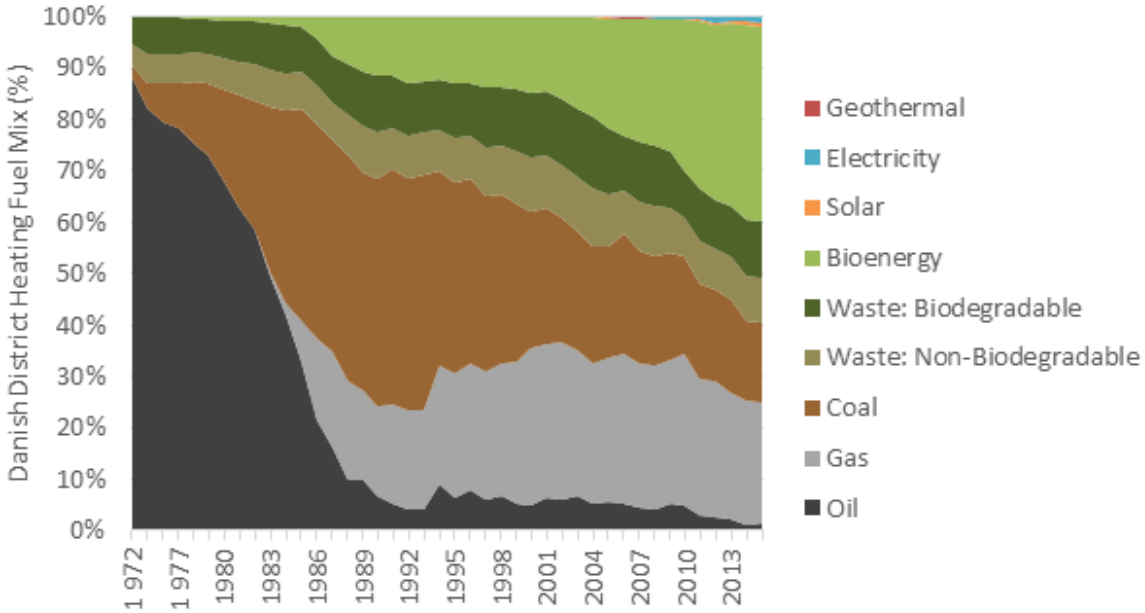

Figure 1: Fuel mix for Danish District Heating from 1972-2015 (Source: "Årlig Energistatistik 2015 (Annual energy statistics 2015)," 2016.)

Cost comparison

The cost-optimal calculations carried out by AECOM on behalf of the DHPLG to inform the building energy regulations shows that district heating has the lowest capital cost for households for non-fossil-fuel based heating supply – cheaper than biomass boiler or ASHP systems, as shown in the table below, extracted from the report1.

This also matches the experience of members who have worked with developers on new residential developments and shown the cost savings across the different solutions to meet the new Building Regulations.

Heating system:

Building Type	Gas Boiler with radiators (EUR/system)	Biomass Boiler with radiators (EUR/system)	ASHP with low temperature radiators (EUR/system)	District heating with radiators (EUR/system)
	Package 1	Package 2	Package 3	Package 4
Bungalow	€ 6,225	€ 20,546	€ 8,479	€ 7,025
Detached	€ 7,375	€ 24,924	€ 10,277	€ 8,225
Semi-detached	€ 6,375	€ 22,161	€ 8,691	€ 7,025
Mid-Floor Flat	€ 5,085	€ 11,976	€ 7,399	€ 5,825
Top-Floor Flat	€ 5,275	€ 11,976	€ 8,561	€ 5,825
Apartment building (costs per unit)	€ 5,148	€ 11,976	€ 7,786	€ 5,825

1. Research

General Comments:

Access to data on building heat demands or data to allow estimates of heat demand, is fundamental to developing DHC systems (and other low-carbon heating technology markets) - it has become increasingly difficult to obtain data, even public data, on buildings in order for heat demand modelling and mapping to be carried out. Census data that was available at small area level is now unavailable for 2016 Census due to

1 https://www.housing.gov.ie/sites/default/files/publications/files/cost_optimal_residential_report_ireland_2018.pdf

misinformed use of GDPR. GDPR has become an excuse for many public bodies not to release data, as their legal teams are overly cautious on releasing data. This is a problem for ALL energy research, not just DHC, but particularly relevant for DHC given its reliance on locational data attributes for spatial analysis.

We would therefore ask that DCCAE seriously consider and revise the policy on data control and advise relevant bodies such as the CSO & SEAI. Semi-state energy utility companies, while they hold commercially sensitive customer data, have data that can be anonymised easily to allow researchers to assess the most cost-effective and low-carbon solutions for heating in Ireland. Moreover, heating oil and LPG distribution companies need to be regulated to force disclosure of fuel quantities delivered with locational data that enables spatial heat planning at a local level.

Allowing these companies (particularly fossil-fuel companies) to retain this data only for their own use reinforces the status-quo and does not allow a level playing field for new technologies and solutions to gain the same market insights. This data needs to be made available to trusted bodies, such as Local Authorities, who are developing new DHC utilities for the public good and helping to meet national level emissions targets.

IrDEA recommend taking the same approach as other EU regions/countries in accessing data and overcoming GDPR issues, such as City of Vienna's Energy Planning Department (contacts and details of this case can be shared).

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

In order for comparable feasibility studies to be carried out for renewable and low-carbon heating solutions (including DH) there needs to be a comprehensive technology guide available outlining average costs, emissions, efficiencies, lifetimes etc., of different technologies. An example of such Technology Catalogues are produced by the Danish Energy Agency, and can be found here: https://ens.dk/service/fremskrivninger-analyser-modeller/teknologikataloger

This resource allows project teams to assess the viability of a variety of technology options using impartial and nationally approved data, based on experience of technologies implemented in Ireland. It also allows the direct comparison of different projects when using the same assumptions. The research behind gathering this information and compiling it should be a priority for resources to support the roll-out of DH (and other low-carbon technologies).

At the moment the comprehensive assessment only includes large scale industrial waste heat from sources registered on the ETS. Further research into the existing indigenous

heat sources available to supply proposed DH networks is also required. This would include information location, capacity, annual heat availability, temperature for sources across the country. An approach similar to that taken as part of the South Dublin Transition Roadmap - where 18 different heat sources were investigated - could be applied nationally.

This is also a requirement under the Recast RE Directive (49) "*To ensure that national measures for developing renewable heating and cooling are based on comprehensive mapping and analysis of the national renewable and waste energy potential and that such measures provide for increased integration of renewable energy, by supporting, inter alia, innovative technologies such as heat pumps, geothermal and solar thermal technologies, and waste heat and cold, it is appropriate to require that Member States carry out an assessment of their potential of energy from renewable sources and the use of waste heat and cold in the heating and cooling sector, in particular to promote energy from renewable sources in heating and cooling installations and promote competitive and efficient district heating and cooling."*

IrDEA have created an online national heat atlas which could be used to evaluate all potential heat sources nationally if funding is made available or a third-party, such as SEAI is tasked with doing this.

A major challenge for district energy will also be replacing existing fossil fuel boilers (e.g. oil and gas) with district heating substations within the buildings. IrDEA recommends that a research 'pilot project' is financed to take best practice internationally for replacing gas boilers with district heating substations, particularly from the UK and Netherlands, and it is applied to an Irish case study.

Geolocated point or street level data of building heat demand and use type. This higher granularity data would allow for more accurate heat mapping and feasibility studies. This point data is available in other EU countries such as Austria for energy planning purposes.

In order to plan for 4th or 5th generation DHC systems, DH system planners will need information on operating temperatures (both flow and return temperatures) along with a general description of the building's heating system (e.g. gas fuelled boilers, under floor heating, radiators, hot water cylinder etc.). Data on new buildings should be collected through the planning application process - requiring a standard energy assessment form to be filled in and submitted with applications. This way the local authorities can manage and utilise this data for DH planning.

For existing buildings, it is obviously a much bigger challenge to collect data, but a system like the mandatory DEC's for public buildings above a certain size could also apply to private sector commercial buildings and include other data such as heat demand and operating temperature.

We are very disappointed to see the SEAI RD&D funding programme has been cut this year and is not available to support much needed research in the low-carbon energy sector in general, but particularly for a fledgling industry such as DHC in Ireland which really needs the research grant support.

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

UCC/SEAI/Codema are currently collaborating to define a methodology to allow DH to be taken into account in national level energy models (IrishTIMES and SEAI energy model). Ensuring the contribution DH can make to Ireland's energy targets is accurately reflected in these models is fundamental to inform policy makers and gain a better understanding of the many benefits DH can provide, including impact on the electricity market with large scale demand side response utilising CHP, heat pumps, electric boilers and thermal storage capabilities.

The IrDEA Heat Atlas, and results of the upcoming comprehensive assessment, should be disseminated to local planning authorities for them to incorporate into their GIS systems and allow them to use them to meet planning requirements around DHC such as those outlined in the Eastern & Midlands Regional Assembly's RSES (RPO 7.38). Heat planning, and generally local energy planning, should become an intrinsic part of the National Development Plan, and local authorities should be mandated to integrate local heat planning in their County/City Development Plans and Local Area Plans.

In the UK, feasibility studies for DH were funded as a first step to establish where local DH projects could be established. After the most feasible areas from these were identified, then pilot projects were funded to install the district heating pipes in these areas. IrDEA recommends that more research funds are put towards both feasibility studies and pilot projects of DH in Ireland.

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

There are two EU projects on District Heating with Irish partners that have many useful research outputs and tools applicable to the Irish market and tested and disseminated by Irish stakeholders;

- Hot Maps https://www.hotmaps-project.eu/

- HeatNet https://www.nweurope.eu/projects/project-search/heatnet-transition-strategies-for-delivering-low-carbon-district-heat/
- SmartReFlex: https://www.solar-district-heating.eu/smartreflex-2/

An output of the HeatNet project for example was the South Dublin Transition Roadmap for DHC, which could be replicated for other local authority areas in Ireland: https://www.codema.ie/images/uploads/docs/HeatNet_NWE_Transition_Roadmap_Report_Final_-_Digital.pdf

A peer reviewed research paper in the Journal of Cleaner Production, and co-authored by Henrik Lund, was published in 2018 - *Implementing cleaner heating solutions towards a future low-carbon scenario in Ireland*[2] - which found that while DHC is more investment heavy, it is more fuel-efficient; the fuel savings more than compensate for the increased investments. The DHC scenario modelled is €300M cheaper in annual costs than the individual heating scenario for Ireland.

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

Compact urban growth is a future-proofing step for feasibility of DHC systems, as the more compact an urban area, the less DHC pipe network infrastructure is required to connect those buildings to the same network, and therefore reduces the upfront capital costs. We therefore suggest that urban planners are made aware of the benefits of compact urban growth to support decarbonising the heating sector - compact urban areas have higher heat densities that support the roll-out of DHC schemes.

Compact growth is a key policy coming from the National Planning Framework (NPF) and the Regional Strategies now in place, and local authorities are obliged to work with sustainable densities. There does not seem to be any gap in implementing it within urban areas, though clearly it is a challenge in smaller towns and commuter belt areas where the market doesn't sustain higher density development.

2. Regulation

General Comments:

IrDEA Workshop on Standards and Customer Protection

[2] https://vbn.aau.dk/en/publications/implementing-cleaner-heating-solutions-towards-a-future-low-carbo

Recently IrDEA held a workshop with our members and government departments to analyse what kind of standards, codes of practice and customer protection is needed in the Irish market, based on the experience of the key players in the DHC market here and those with experience in other new markets in Europe such as the UK. The conclusions of this workshop show there is a need for specific guidance for the different stakeholder groups involved in the different phases of development of DHC systems;

- Local Authorities/Public Sector (e.g. planners)
- Developers
- Building M&E designers
- Building owners

It was also discussed that transparency on pricing and protection for customers against escalating costs is required to give assurances to new customers connecting to DHC systems and to ensure the market does not suffer from negative perceptions. This could be a voluntary customer charter that suppliers can sign up to, much like the Heat Trust in the UK, until such a time that the DHC market has grown to a level where it requires national level customer protection regulation through the CRU. Similarly, in Denmark all DH schemes are required to submit the average heat price on their network to the energy regulator each year, so there is assurances for consumers that they are at a reasonable price level

IrDEA are progressing work to establish;

- A catalogue of case-studies from the Irish market for communal, localised and district level heating & cooling systems.
- A voluntary Customer Protection Charter for DHC suppliers operating in the Irish market.
- Technical Design Guidelines for the design of secondary heating systems connecting to DHC to ensure high efficiency of operation.
- An online directory of supporting material to increase knowledge and support development of DHC in Ireland.

We would like to develop these deliverables in collaboration with DCCAE and other relevant bodies such as SEAI and DHPLG, with a view that they would form the basis of future national level documents.

International Review Market of DHC Market Frameworks

A recent report produced on behalf of the UK Dept. BEIS[3] gives a review of international DHC market frameworks, specifically focusing on those in new DHC markets that are more relevant for comparison to the UK (and Ireland).

This report shows that in countries where DH has been most successful, the ownership of the heat network companies is at municipal (local authority) level. This report also discusses the benefits associated with regulation in areas such as consumer protection, safety and price transparency. In many countries where municipality-led DH networks are developed self-regulation is common place as it is the duty of the municipality to serve its citizens and to deliver solutions that are in line with their socio-economic, energy efficiency, carbon reduction targets.

In relation to connection policy it is the conclusion of this BEIS report that mandatory connection does not appear to be essential, policies which in some way result in customers favouring heat networks are essential for investment to take place (e.g. from our members experience engaging with developers on new-build residential developments in Ireland, they see DH as a more cost-effective option than individual heating systems such as heat pumps). Mandatory connection as a last resort seems to be an important protection in those markets that use it sparingly - this may equate to using mandatory connection in designated DH zones where the cost and climate benefits are apparent. For example, in Denmark the municipalities designated areas as DH so if consumers were replacing their heating system, they either had to keep the same fuel source they were using at present (typically this was oil) or connect to the DH system, but they couldn't switch to a different fuel source other than DH.

Private-wire regulation

Combined heat & power (CHP) is an obvious technology for DHC supply; it greatly increases the efficiency of stand-alone electricity generation when also providing heat supply. Most district scale DHC has some form of CHP supply into the network. In Ireland we have a private-wire regulation that is not common to most other EU countries. This restricts the electricity from being used in other buildings and only allows sales of electricity generated back to the grid.

Currently onsite CHP on communal DHC schemes in Ireland is restricted to providing the generated power downstream of a single electricity meter and exporting any excess power to the grid. The price available for exporting does not support generation to grid and the single meter electrical load (usually the site landlord) is smaller than the CHP output capacity so operators must resort to turning off the CHP or reducing the CHP output.

[3] https://www.gov.uk/government/publications/international-heat-networks-market-frameworks-review

If operators were able to provide power downstream of all electrical meters on the site (as is commonplace in other countries) they would be able to maximise the output (power & heat) of the CHP thus increasing overall efficiency and lowering costs. Running the CHPs in this way would be feasible, as it would provide a competitive price for power versus residential import electricity prices, while the customers would still retain their own grid import meter and ability to choose their own import supplier.

The benefits of CHP are well proven in terms of improved efficiencies (vs imported grid power and boilers) and carbon savings. CHP should play a significant part in DHC in Ireland, particularly where a site may not be near enough to connect to a district heat network for a number of years, but won't be realised due to this private wire issue. We therefore recommend a change in legislation to accommodate this low-carbon and increased energy efficiency measure.

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)?

Firstly we would like to highlight the importance of Article 23(1) which has not been referenced in this consultation document;

Ireland has a huge resource of zero-carbon waste heat that we are not putting to use and that could vastly off-set our use of imported fossil-fuels for heating. Article 23(1) seeks to promote the use of renewable energy in the heating and cooling sector, whereby each Member State is to attempt 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)). Waste heat can provide up to 40% towards the yearly target of the 1.3% increase of renewable heating and greatly assist Ireland to meet our targets and move from second-last place in Europe. In order to ensure that waste heat contributes towards the renewable heat targets, (a) and (b) in Article 23(4) should be transposed by the mid-2021 transposition deadline.

Article 24:

The percentage contribution of DH to overall heat & cooling demand in Ireland is unlikely to meet the 2% in the short term, and we agree that introducing overly complex regulation aimed at existing large DHC markets could be more of a hindrance to establishing DHC as a new market player in the heat sector in Ireland.

The elements of Article 24 that should be introduced in the short term are;

1. *Member States shall ensure that district heating and cooling suppliers provide information to end-consumers on their energy performance and the share of renewable energy in their systems. Such information shall be in accordance with standards used under Directive 2010/31/EU.*

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

2. Member States shall lay down the necessary measures to allow customers of those district heating or cooling systems which are not 'efficient district heating and cooling' within the meaning of Article 2(41) of Directive 2012/27/EU to disconnect from the system in order to produce heating or cooling from renewable energy sources themselves, or to switch to another supplier of heat or cold which has access to the system referred to in paragraph 4.

3. Member States may restrict the right to disconnect or switch supplier to customers who can prove that the planned alternative supply solution for heating or cooling results in a significantly better energy performance. The performance assessment of the alternative supply solution may be based on the Energy Performance Certificate as defined in Directive 2010/31/EU.

4. Member States shall lay down the necessary measures to ensure non-discriminatory access to district heating or cooling systems for heat or cold produced from renewable energy sources and for waste heat or cold. This non-discriminatory access shall enable direct supply of heating or cooling from such sources to customers connected to the district heating or cooling system by suppliers other than the operator of the district heating or cooling system.

5. An operator of a district heating or cooling system may refuse access to suppliers where the system lacks the necessary capacity due to other supplies of waste heat or cold, of heat or cold from renewable energy sources or of heat or cold produced by high-efficiency cogeneration. Member States shall ensure that where such a refusal takes place the operator of the district heating or cooling system provides relevant information to the competent authority according to paragraph 9 on measures that would be necessary to reinforce the system.

6. New district heating or cooling systems may, upon request, be exempted from the application of paragraph 4 for a defined period of time. The competent authority shall decide EN 91 EN on such exemption requests on a case-by-case basis. An exemption shall only be granted if the new district heating or cooling system constitutes 'efficient district heating and cooling' within the meaning of Article 2(41) of Directive 2012/27/EU and if it exploits the potential for the use of renewable energy sources and of waste heat or cold

identified in the comprehensive assessment made in accordance with Article 14 of Directive 2012/27/EU.

7. The right to disconnect or switch supplier may be exercised by individual customers, by joint undertakings formed by customers or by parties acting on the behalf of customers. For multi-apartment blocks, such disconnection may only be exercised at whole building level.

8. Member States shall require electricity distribution system operators to assess at least biennially, in cooperation with the operators of district heating or cooling systems in their respective area, the potential of district heating or cooling systems to provide balancing and other system services, including demand response and storing of excess electricity produced from renewable sources and if the use of the identified potential would be more resource- and cost-efficient than alternative solutions.

9. Member States shall designate one or more independent authorities to ensure that the rights of consumers and the rules for operating district heating and cooling systems in accordance with this Article are clearly defined and enforced.

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

There are multiple parts of a DHC system and it is good to ensure that each is highlighted when speaking about ownership so there is no confusion;

- **Heat supply** - there are typically multiple heat suppliers into a large DHC network which may or may not be owned by the DHC network operator. The back-up or peak load heat supply is often owned by the DHC operator, but this can also be provided by third parties. There is therefore room for many private sector low-carbon heat suppliers to be active in the DHC market.

- **Heat (and/or cooling) Network -** the main transmission and distribution network pipelines are often owned by the operator directly or can be contracted by owners to operators to operate on their behalf. Network owners are typically local authorities or local authority utility companies, and we would suggest that the network assets should follow this trend and be owned and kept in public ownership in Ireland. DHC networks, like electricity networks, are a vital infrastructure to decarbonise the energy sector and need to be able to develop and connect to customers that are outside the very feasible 'high returns' areas. It is also likely that the development of new networks will require significant public investment given private capital comes at too high a cost for the returns on a system competing with low-cost fossil-fuel alternatives. This does not preclude

public-private partnerships or concessions, as long as the network assets remain in or revert to public ownership.

- **Customer Heat Substations -** There are mixed experiences in other markets with substation ownership - some operators prefer to own the substation to retain more control to ensure efficient operation and to incentivise connection by taking on the upfront capital costs for retrofit customers, while some schemes the customers prefer to own their own substation and the operators do not want the hassle of the maintenance and access to private property. We do not see a need to define this ownership as it should come down to what suits each operator/customer agreement.

Q8: Should there be a district heating market regulator?

A recent report produced on behalf of the UK Dept. BEIS gives a review of international DHC market frameworks, specifically focusing on those in new DHC markets that are more relevant for comparison to the UK (and Ireland).

This report shows that in countries where DH has been most successful, the ownership of the heat network companies is at municipal (local authority) level. This report also discusses the benefits associated with regulation in areas such as consumer protection, quality of service, safety and price transparency. In many countries where municipality-led DH networks are developed self-regulation is common place as it is the duty of the municipality to serve its citizens and to deliver solutions that are in line with their socio-economic, energy efficiency, carbon reduction targets.

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

Given the current knowledge gap in Ireland regarding DH it is vitally important that guidelines are developed to ensure a minimum standard is reached in regard to projects at all stages of the process feasibility, design, business models, legal agreements, procurement, construction & installation, commissioning, operation & maintenance, guidance on relevant qualifications & regulations. In relation to the feasibility stage, having an approved somewhat standardised procedure will provide greater confidence in investment decisions.

Similar work developing such guidance documents has been done in the UK, Denmark, and elsewhere in the past. This could be drawn upon as a source for much guidance. However, this information should be curated by an Irish body with expertise in the DH industry in Ireland (e.g. the Irish District Energy Association, Codema) which fully

appreciates the differences between Ireland and these other countries and the challenges in delivering projects in Ireland. This would ensure the most applicable international information and Irish-specific content is included in the guidance. It could be carried out in collaboration with the Sustainable Energy Authority of Ireland

Another area which would help remove barriers for those who wish to develop DH networks is a guidance and templates for letters of support/commitment from potential customers, customer supply agreements, energy supply contracts and maintenance contracts. Again drawing on both national and international experience to arrive at a best practice solution.

3. 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?

High density development is of course helpful to support the roll-out of DH systems, but the Heat Atlas research has already shown the heat demand densities are already there in Ireland to support the roll-out of DHC, so density at this time is not the most pressing planning or regulatory issue.

Planning authorities could better support DHC by applying planning conditions similar to those used in London in areas where heat density is suitable for DHC - such as applying conditions that buildings must be 'DH enabled' in these zones, that they must connect to the DHC network if it is a lower carbon solution to an individual solution, and importantly ensuring any new industrial development with a useful waste heat source is future proofed to connect to a DHC network. These types of planning requirements have already been used and trialled in Dublin scheme development and are absolutely fundamental to de-risking and laying the foundations for future DHC development. These practices need to become mainstream for planning departments in all local authorities, starting with those with large dense urban areas.

The EMRA's RSES policies requirements around DH and heat mapping have greatly assisted the development of DH planning going forward for LAs within this region, and should be replicated in the other regional assembly areas.

As an example, the Scottish government have also provided guidance[4] on developing local development plans and planning policy which states:

Local development plans should:

- *Use heat mapping to identify the potential for co-locating developments with a high heat demand with sources of heat supply.*
- *Support the development of heat networks in as many locations as possible, even where they are initially reliant on carbon-based fuels if there is potential to convert them to run on renewable or low carbon sources of heat in the future.*
- *Identify where heat networks, heat storage and energy centres exist or would be appropriate and include policies to support their implementation.*

Planning Policy should:

- *Support safeguarding of pipe runs within developments for later connection and pipework to the curtilage of development.*
- *Give consideration to the provision of energy centres within new developments.*
- *Where a district network exists, or is planned, or in areas identified as appropriate for district heating, policies may include a requirement for new development to include infrastructure for connection, providing the option to use heat from the network.*
- *Secure provision for a heat storage tank from non-renewable sources if there is potential to switch to renewable sources within the lifetime of the development.*
- *Encourage micro-generation and heat recovery technologies associated with individual properties where heat networks are not viable.*

Building Energy Regulations

The recast Renewable Energy Directive 2018/2001 (48) states, in relation to meeting the energy requirements of new building and renovation regulations, that "*Member States should allow, inter alia, the use of efficient district heating and cooling or, where district heating and cooling systems are not available, other energy infrastructure to fulfil those requirements*."

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 is a problem with having a carbon coefficient and a separate renewable energy requirement when utilising waste heat. Waste heat is not classified as renewable, but is zero-carbon as it has no fuel associated with producing it as it is a waste product of a primary process. The EU RES directive allows waste heat to contribute to the RES-H targets. A dwelling which is supplied by a DHC scheme utilising waste heat will far over-achieve in terms of energy efficiency and carbon, but will not meet the renewable

[4] https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2013/06/heat-demands-planning-advice/documents/heat-pdf/heat-pdf/govscot%3Adocument/heat.pdf

energy element. This means that you could have a near zero-carbon home - supplied fully with zero-carbon heat, but it will still require an investment in an on-site renewable technology to meet the RER threshold.

The typical developer response to meeting the RER now is to install a number of PV panels on the roof (with no batteries) as it is the cheapest solution, regardless if this is the best operational solution, for example, if there is nobody home during the day to actually use the electricity generated from the PV. If carbon emission reductions are the primary driver of the building regulation, the assessment should be based purely on efficiency and carbon emissions. **This can easily be adjusted in the Dwelling Energy Assessment Procedure (DEAP)** which produces the Building Energy Rating (BER).

Another issue which is pressing for the development of current schemes is meeting the connection timelines for new developments - in other jurisdictions in Europe, there is an allowance for buildings to connect to a temporary supply (provided by the DH provider) until the network pipes are laid to connect the building to the main low-carbon network. There is typically a window of 3-5 years given for the DH operator to switch the building from the temporary supply to the main DHC supply. The temporary supply is typically the cheapest solution - i.e. gas boilers. At the moment there is no allowance for a temporary supply to be provided to new buildings using a temporary higher-carbon source such as gas boilers. This means that many DHC schemes will miss out on connections to many new buildings as the network may not always be close enough to connect within the building delivery timeline. This is a big issue when heat demand connections are the biggest risk for DHC financial viability and new developments are a key foothold in the market.

IrDEA recommends that new developments are offered a window of 3 years to connect to a DH network.

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

The latest update of Part L of the building regulations has gone a long way to incentivise developers to utilize DHC over other options, where DHC is available. The changes suggested in response to question 10 will improve the situation for DHC schemes.

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?

The Office of Government Procurement (OGP) needs to produce clear guidance for public authorities which allows them to choose DHC supply over other heating fuel supply such as oil and gas that are procured centrally through the OGP. There is a fear in public procurement departments that connection to a heat supply that has not been procured through the OGP will be in breach of public procurement rules. In the case where DHC supply comes at a higher price than fossil fuel heating but has significantly lower emissions, the public authority should be allowed to use green procurement methods to ensure the lowest carbon supply, rather than the cheapest supply, is used.

Under the Local Government Act and Local Government Reform Act 2014 the Local Authorities (LAs) have powers to take measures or engage in activity that is necessary in the interests of the local community; these interests are defined as promoting social, economic and environmental development, including providing utilities or equipment for specific purposes. Developing local DHC systems falls under this legal remit and therefore LAs have the powers to implement DHC schemes.

The main barrier is, as there is no defined DHC utility owner/owners, DHC is not afforded the same rights in the Planning and Development Act as other utility developers. The LAs need to be named as the legally licensed DHC utility owner and operator in each LA area and given the same rights as gas/electricity network utilities to lay pipes.

Suggested amendment to the planning regulations has already been drafted by Dublin County Council planners and given to DHPLG but has not moved any further than this. IrDEA suggest that this amendment is given higher priority by DHPLG or this could cause delay to projects that are specifically named and outlined in Project Ireland 2040 and supported by DCCAE and SEAI.

Right to supply energy to citizens within their region but also form agreements with other local authorities to supply across borders in areas where a proposed network is located near LA boundaries.

4. Financing

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

DH networks that are currently under development in Ireland have gained grant funding through DCCAE's Climate Action Fund (CAF) and also from the EU's Interreg programme. The Support Scheme for Renewable Heat (SSRH) is also open for District Heating heat supply from bioenergy & grant for heat pump technologies, but not the network infrastructure.

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

This is completely dependent on the particular circumstances of each scheme - unfortunately there is no one answer to finance the DH sector. The only obvious and common thing across all large DH scheme development is that these schemes will require a level of government financial support until such a time that DHC can compete fairly in the market. DHC is competing against heating fuel supplies from fossil-fuel utility providers such as gas, with gas networks having had decades of government support to roll-out the network across Ireland. A fundamental support for DHC, along with all other low-carbon heating solutions, is to fairly price the cost of carbon and introduce taxes that reflect that cost. We strongly feel that carbon taxes collected from fossil-based heating fuel providers be used to support the uptake and development of low-carbon heating solutions, in much the same way that the PSO supports the integration of renewable electricity.

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

Again, there is no one-size-fits-all solution, and a range of template contracts and business models should be piloted and supported to gain insight and establish guidance to developing a range of DHC type schemes in the Irish market.

A recent report produced on behalf of the UK Dept. BEIS gives a review of international DHC market frameworks and shows that in countries where DH has been most successful, the ownership of the heat network companies is at municipal (local authority) level.

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?

One of the barriers to the non-exchequer financing for district heating is uncertainty regarding the timing and quantity of heat demand to be served by the network, often referred to as connection risk. This is important because of the need to make returns on the up front capital expenditure on these networks. This connection risk can be helped in a number of ways:

- One of the key factors in mitigating this risk is ensuring that the heat network can supply these buildings within the buildings completion date and therefore prevent alternative heating technologies being installed in these buildings. Providing greater certainty around DH utilities statutory powers to open roads, install infrastructure and supply energy in the same way that other utilities do. These

rights may include, easement rights, rights to install pipes in roadways, streetworks rights, rights to supply energy to customers.

- Having a greater certainty in terms of heat demand by having defined district heating zones where buildings are required to be DH-enabled/connected can also help build a really solid business case.
- Lack of knowledge and training in DH specific elements of hydraulic modelling, hydronic systems, welding, trenching requirements, commissioning. Additional modules to existing courses in similar areas could bridge this knowledge gap and provide people with the skills and qualifications needed to design, install and maintain this major new renewable energy infrastructure. This would enable DH contractors to recruit local, highly-skilled workers.

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?

Yes, in effect offsetting against carbon tax results in an increased system efficiency (combined heat and power efficiency) and should be treated as such. Another option would be to tax the waste heat from industries with large amounts of heat to give it a value and to incentivise its use.

In general an effective carbon tax, which should fully take all negative externalities fossil fuel use into account, will incentivise the move to low-carbon solutions. The new Government needs to send a clear message to the markets that carbon taxes are part of the long-term policy plan and will at least reach €80/tonne by 2030.

Customer heat exchanger units (HIUs) should be added to the SEAI homeowner grant list for low-carbon heating solutions to support retrofit of DH supply.

Require public buildings to connect to low-carbon heat networks where the heat supplied is lower carbon than their alternative.

Provide low-cost green loan facility for local authorities to develop DHC networks, similar to the HFA loan facility.

Establish a dedicated unit to aid local authorities and public sector organisations to meet requirements in planning, feasibility assessment and project development (similar to the Heat Unit in BEIS in UK gov).

Require cost benefit analysis for further infrastructure development on gas networks

to consider a heat network alternative in all investment applications.

Work with Trade training providers (FET, SOLAS, FÁS, Technical Colleges) to establish a DHC trade program module that fits into existing mechanical trade training.