

Heating and Cooling in the European Energy Transition The EU's Heating and Cooling Strategy

District Heating and Cooling - A CELSIUS Perspective

The European Energy Union

The European Energy Union Package proposes the goal of a resilient Energy Union with an ambitious climate policy at its core aimed at providing consumers with secure, sustainable, competitive and affordable energy.

Within this package there is recognition of the important role that heating and cooling, at a system and building level, has to play in this transition and the requirement for an EU Heating and Cooling Strategy that sets the framework within which Member States can operate.

The CELSIUS Perspective

The CELSIUS project strongly supports this initiative and its recognition of the important role that district heating and cooling will have to play in it.

Each of our five partner cities: Gothenburg, Cologne, Genoa, London and Islington Council, and Rotterdam; have ambitious climate and energy goals with district heating and cooling networks, making increasing use of waste and environmental heat sources, playing an important part in helping us achieve those goals. We will also be actively supporting cities across the EU to develop their ambitions around district heating and cooling.

We believe that district heating and cooling networks, deployed where there is sufficient heat density, has a very important part to play in developing a secure, sustainable, competitive and affordable European energy system that helps it meet its climate targets in the most cost effective way.

We were delighted to be invited to present at the EU's 'Heating and Cooling in the European Energy Transition' Conference in February 2015 and we remain very keen to continue engaging with this process and supporting the development and ultimately delivery of this strategy.

Suggestions for EU's Heating and Cooling Strategy

a) Overarching Suggestions

Suggestion 1 – Set an overarching aim for the strategy to reduce primary energy demand and greenhouse gas emissions. Consider this when creating, evaluating or revising all other related Directives or Strategies and reviewing their implementation.

Suggestion 2 – Encourage approaches that pursue energy efficiency and decarbonisation of energy supply measures simultaneously to deliver the most cost and carbon efficient solutions.

- *The Heat Roadmap Europe (HRE)¹, a research initiative carried out by Aalborg and Halmstad Universities, offers robust and compelling evidence that a district level energy*

efficiency policy framework based on optimising the combination of demand and supply side measures, the EU could achieve its main climate and energy objectives, most notably an 80-95% GHG reduction compared to 1990 levels, for roughly €100 billion less per year between now and 2050 compared to a scenario in which energy savings targets are pursued through building-level measures alone.

Suggestion 3 - Promote the role that district and smaller scale heating and cooling networks combined with the utilisation of local waste and environmental heat sources have in enabling the evolution of secure, low carbon and affordable energy systems that reduce demand for primary energy and improve local air quality. This includes the role for heat networks in grid balancing and integration of intermittent renewable energy generation through their ability to store electrical energy in the form of heat. This is relevant at a micro-grid level as well as at a distribution network level.

Suggestion 4 – In proposed revisions of the Energy Efficiency Directive and Energy Performance of Buildings Directive incorporate amendments that drive cost effective solutions and maximise reductions in greenhouse gases and primary energy demand so that district heating and cooling solutions can compete fairly with building level heating and cooling solutions.

b) Specific Suggestions

Suggestion 5 – Revisions to the Energy Performance of Buildings Directive (EPBD) should include a requirement that all member states when implementing or reviewing implementation of this Directive incorporate a Primary Energy Index, taking into account the entire energy value chain, as part of that methodology. This will optimise energy efficiency in buildings by recognising the greater and more cost effective efficiencies that can be made by looking at a building and system level solution together.

- *For example the implementation of the EPBD in Sweden and the Netherlands has failed to account for primary energy, taking into account only the amount of energy delivered and not how that electricity and heat is produced or if secondary energy sources are exploited. These methods create unnecessary burdens on district heating solutions in competition with other, small-scale heating technologies when developing cost and carbon optimum solutions.*

Suggestion 6 – The Energy Performance of Buildings Directive should recommend that all Building Certification Methodologies used in the EU comply with the approach suggested above to ensure that the buildings being certified by these methodologies are given credit for reducing greenhouse gases and primary energy demand whether that is at a building level, system level or both. This will help even out the playing field in which building and system level heating and cooling solutions are competing, allowing fairer competition and ultimately optimum solutions being identified.

Suggestion 7 – Explore opportunities for creating or enabling the establishment of a dedicated Project Development Funding Stream or Programme, similar to the EIB's ELENA programme, that allow cities to assemble the specialist technical, financial and commercial support that they need to develop a pipeline of commercially viable projects that they can then seek funding for from public or private sector investors.

Suggestion 8 – Establish a new or identify an existing investment mechanism or fund that recognises the inherent risk profile of district heating and cooling projects, high in their early operational stages and dropping off as consumers are signed up. This would make long-term

flexible capital, up to 15-20 years, available which would really catalyse delivery of district heating and cooling projects and trigger private sector investment in them.

Suggestion 9 – Explain the role and benefits that district heating and cooling can play in developing integrated energy systems that are flexible in their use and integration of diverse energy sources and resilient in their ability to provide grid balancing through thermal storage. This will allow cities to make the most cost effective reductions in primary energy demand.

- *Establish a requirement for individual cities to develop energy masterplans to compliment heat maps developed by Member States. The energy masterplans should at least cover existing and future heat demand, all known existing and future heat sources along with insight into the most cost efficient primary energy reduction approach, and then identify priority areas within cities where district heating networks should be developed with adjacent or local heat sources.*

Suggestion 10 – Encourage creation of local Planning policy that supports development of district heating networks in areas prioritised by Suggestion 9, either by encouraging the connection of new developments into existing district heating networks or future proofing new developments so they can connect to district heating networks once they are built and operational.

Suggestion 11 - Explore all available options for positively encouraging organisations that emit waste heat to actively seek to make that heat available to consumers either directly or through a district heating network.

- As part of this activity the EU Emissions Trading Scheme should be reviewed to assess how it is and could be used to actively encourage the use of waste heat to help meet heating demand, this could include assigning an actual value to waste heat.
- This process should also assess the opportunity to assign waste heat the same status as renewable energy due to its ability, when integrated into district heating networks, to also directly reduce greenhouse gases and primary energy demand which is the overarching aim of this strategy.

Suggestion 12 – Initiate dialogue on how the sector can best deliver consumer protection, including competitive pricing and service to consumers, to develop trust and address some of the issues associated with being a monopoly supplier.

Suggestion 13 – To ensure that existing and new heating and cooling networks are able to easily interconnect with adjacent networks as they grow Member States and cities should consider developing common technical standards or Codes of Practice.

- *London has produced a District Heating Manual that does this, see: <http://www.londonheatmap.org.uk/Content/TheManual.aspx>*
- *CIBSE in the UK has also: <http://www.cibse.org/getmedia/37b074a1-517b-4868-89aa-88947d8ced44/draft-Heat-Networks-Code-of-Practice-for-the-UK.pdf.aspx>*

Suggestion 14 – Promote the important role that innovative use of ICT and smart technology applications has to play in development of smart energy grids by integrating energy systems and optimising efficiency and performance in district heating and cooling networks. For example the greater use of two-way data in the modelling, smart control and operation of the primary and secondary systems benefits both operators and consumers.

European Energy Union and the Contribution of District Heating Systems

We believe that district heating and cooling systems will actively support each of the EU Energy Union's interrelated dimensions:

- 1. Energy security, solidarity and trust** - Delivering improved energy security by creating a more self-sufficient energy city or region, one that consumes less primary energy to meet its heating demand and is less dependent on imported fossil fuel energy supplies. The creation of district heating networks allow the city to effectively utilise and cascade local sources of waste and environmental heat whilst efficiently generating, integrating and utilising local low carbon and renewable energy sources;
- 2. A fully integrated European energy market** - By supporting a greater integration of heat and power networks and systems it will support the gradual development of a fully integrated single internal energy market.
- 3. Energy efficiency contributing to moderation of demand** - Increased energy efficiency undertaken at both a building and city level simultaneously reduces demand for primary energy and realises carbon dioxide emission reduction targets in the most cost effective way. *A recent London study suggested that supplying 50% of London's heat demand from district heating by 2050 would cost £22bn less than supplying it through building-level solutions alone;*
- 4. Decarbonising the economy** – Supporting the reduction of greenhouse gas emissions and actively enabling energy system balancing and effective integration of intermittent renewable technologies into both national and city energy systems will help the decarbonisation of national economies. These energy systems will improve the competitiveness of businesses connected to them compared to those that are still reliant on fossil-fuel based energy;
- 5. Research, innovation and competitiveness** - The drive for smart grids, energy efficiency, optimisation of energy systems and integration of low carbon and renewable energy sources coupled with efficient storage solutions will create opportunities for Research and Development.