

DRAFT RECOMMENDATION PAPER

Making more of waste heat to decarbonise cities

Heating and cooling accounts for around half of the energy consumed in the European Union.¹ Despite significant measures to reduce the demand, residential and tertiary buildings, as well as the industry will still need heat and cold. **Delivering sustainable heating and cooling solutions to cover this demand is fundamental to achieve Europe's climate neutrality ambition.** The deployment of renewables and waste heat used in district heating (DH) networks is part of the solution.

The EU produces more waste heat than the demand of its entire building stock². A recent study conservatively estimates that **industrial waste heat could cover at least 25% of district heating generation.** Moreover, there is significant heat recovery potential from unconventional waste heat sources, which could cover 10 % of the EU's total energy demand for heat and hot water³.

This paper outlines recommendations to **boost the waste heat recovery and use in DH networks, to help decarbonise cities.** It is based on an extensive analytical work⁴ carried out for the delivery of the Urban Agenda Energy Transition Partnership Action 2 on Maximising Waste Heat recovery in Cities⁵ and addresses all levels of decision-making.

A reinforced EU framework to unlock waste heat recovery at larger scale

1. Set a uniform CO2 price across the heating sector

The most efficient type of policy measure to drive the decarbonisation of heating and cooling, increasing the share of renewables and waste heat, is to **ensure a level-playing field** in the heating sector for instance with a carbon tax or an extension of the scope of the EU ETS to buildings.

2. Promote best practices

- EU countries have **different market conditions and regulatory frameworks** for district heating and cooling, matching their local realities. There are already projects where waste heat recovery and use is directly or indirectly supported.
- The European Commission should **promote these good practices**, for example, in the framework of concerted actions aiming at supporting the implementation of EU legislation.
- These good practices can be, but are not limited to⁶:
 - the use of taxation (CO2 taxation, lower VAT rate for sustainable energy), dedicated sustainable heating and cooling project funds
 - heat planning requirements,
 - the use of white certificate schemes,
 - compulsory cost-benefit analysis to use waste heat in priority instead of building new heat capacity, prior to granting public funds.

¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1575551754568&uri=CELEX:52016DC0051>

² <http://www.heatroadmap.eu/>

³ ReUseHeat project report "Accessible Urban Waste Heat" <https://www.reuseheat.eu/project-documents-newsletter/>

⁴ Discussion Paper prepared by AIT. This process is based on literature and expert review, from the district heating and cooling sector, city representatives, researchers and waste heat owners; <https://www.euroheat.org/wp-content/uploads/2020/06/Discussion.pdf>

⁵ <https://ec.europa.eu/futurium/en/energy-transition>

⁶ Best practices from Member States outlined in the Discussion Paper, part II; <https://www.euroheat.org/wp-content/uploads/2020/06/Discussion.pdf>

3. Define a consistent EU legislative framework

The recently adopted energy package, in particular the amendment to the Energy Efficiency and renewable energy Directives acknowledged the role of waste heat for energy efficiency and decarbonisation. This is a good starting point, as **a stable and consistent framework to promote waste heat across EU legislation is key.**

- A broad definition serves energy and climate objectives well, but it should stay uniform across EU legislation.
- While it is difficult to anticipate the implementation of the Renewable Energy Directive (RED II), **treating all sources of waste heat equally and on par with renewables would be beneficial to encourage Member States to support waste heat recovery.**
 - For instance, with regards to article 23 of RED II, when Member States want to count waste heat towards their renewable heating and cooling target, the renewable share increase raises from 1.1 to 1.3 percentage point per year.
 - Moreover, waste heat from sewage water is considered as ambient energy and thus as a renewable energy source, it can be counted toward national renewable energy targets, while other waste heat sources are left out.

4. Update EU modelling tools to integrate waste heat utilisation in decarbonisation strategies

Waste heat should be **recognised as an important contributor for decarbonisation of heating and cooling and support smart sector integration.** However, there are acknowledged **limitations with respect to heating and cooling aspects of the energy system model** used by the Commission to establish the scenarios in the Long-Term Strategy.

- These shortcomings should be adequately addressed, as it is vitally important that heating and cooling and waste heat are well integrated into projections about 2050 pathways and scenarios.

5. Promote the visibility and use of the results of the EED Comprehensive Assessments

Identifying the potential is a key step towards utilising waste heat. It strengthens energy planning and helps trigger investments. Member States are preparing their new National Comprehensive Assessments (CAs) under article 14 and Annex VIII of the Energy Efficiency Directive, to be delivered to the European Commission by the end of 2020.

- The Commission, when communicating with Member States on this exercise, should **emphasize the need to provide a good assessment of waste heat potential**, not only in terms of the amount available but also in terms of potential utilisation in the heating sector.
- The CAs should be a tool to help all governance levels, from national to local and regional, plan their heating and cooling strategies.
- During the elaboration process, Member States should **ensure the participation of stakeholders** involved in the energy planning and refurbishment of heat infrastructure.
- The CAs should also be the basis for concrete measures, as foreseen in article 14 4. of the EED.

Empowerment and cooperation for waste heat actors

1. Ensure the cooperation between governance levels

Cities and buildings are at the heart of the decarbonisation challenge. While heat infrastructure decisions and implementation remain local, their crucial role in the broader energy system as a **flexibility provider**, makes a **structured dialogue to ensure the alignment and coherence between local actors such as cities and EU level decision-makers** an absolute necessity.

- Opportunities should be provided for the local level to share its experience of decarbonisation and to **participate more actively in the definition of EU policies**.
- RED II article 15 foresees that competent authorities should **consider waste heat utilisation when planning**, including early spatial planning, designing, building and renovating urban infrastructure, industrial, commercial or residential areas and energy infrastructure. This provision should be further strengthened.
- The EU could play an active role in **fostering the development of long-term planning for cities**, also in connection with providing more **funding opportunities for infrastructure**. In this perspective, DHC networks should be an integral part of building renovation strategies, as building decarbonisation can be supported by efficient and decarbonised networks.

2. Empower the different waste heat actors: better communication, knowledge and trust

Waste heat actors have **limited opportunities to meet and exchange** with each other, they are focusing on their core activities and do not necessarily have the knowledge to cooperate to implement successful waste heat recovery projects. Some EU projects and initiatives already support cities in their decarbonisation efforts by providing networking opportunities, expert support, peer review and mapping and planning tools.⁷ More public funding needs to be committed to foster better communication, spread knowledge and create trust between them.

- The development of local, regional and national **forums for matchmaking, facilitating contacts and exchange** between waste heat owners and district heating operators, as well as city planners and developers of large urban properties would help kick-start discussions on possible projects.
- **Spreading know-how, good practice and training stakeholders** that have little or no experience of waste heat, e.g. city authorities and district heating companies staff involved in contract negotiations or planning, would help the development of more projects.
- **Raise awareness of waste heat in the general population and end-users**, to identify waste heat as a sustainable and local heat source, thus boosting demand and acceptance.
- **Databases and software** are key to identify and match waste heat sources and heat demand. The development new- and the use of existing tools should be promoted.

⁷ See the projects listed in the Discussion Paper prepared by AIT, Part II, 6; <https://www.euroheat.org/wp-content/uploads/2020/06/Discussion.pdf>

A robust financing and business framework for waste heat projects

1. Promote advanced risk management mechanisms

Waste Heat recovery projects have rather **high CAPEX and financial risks** (e.g. change in the availability or quality of the waste heat). They require long-term commitments with long pay-back periods, sometimes not compatible with the constraints associated with the development and operation of businesses. These risks are a major challenge to the development of more projects. Comparably, geothermal energy projects which have similar but not identical challenges already benefit from risk insurance or risk mitigation schemes.

- **Support should be provided to investigate the mitigation of risks for waste heat projects, for example, insurance schemes and risk analysis methodologies. Training of finance actors** to waste heat project financing should also be promoted.⁸
- Support pilot projects to implement the concept of **credit facility**⁹ aiming at better sharing the risk between institutional banks, commercial banks and institutional entities.

2. Recognise waste heat as a sustainable investment

There is an **increasing demand for sustainable investments and bonds**. The recognition of the sustainability of waste heat projects in the EU taxonomy¹⁰ and the European Investment Bank lending criteria is a positive and encouraging signal for investors and should promote further investments.

3. Support the development of standardized contracts and business models

Overall waste heat projects are rather complex and there is great diversity of contracts and business models depending on the source, number of players involved, size, technology, etc.

- **Identifying best practices for business models** derived from real projects could help waste heat owners and DH operators in their dialogue.
- Standardized contracts and clauses should also result in **swifter negotiations of contractual arrangements and transparency** and thus simplify the development of projects. Despite the unique nature of many waste heat projects, it is possible to derive standard clauses from similar settings and essential elements to be included in contracts.¹¹ Further work should be carried out to identify best practices from existing projects.

⁸ See examples in the Discussion Paper prepared by AIT, Part II, 3; <https://www.euroheat.org/wp-content/uploads/2020/06/Discussion.pdf>

⁹ The concept has been developed in the framework of the ReUseHeat project; see: <https://www.reuseheat.eu/wp-content/uploads/2019/06/D2.2.-Bankability.pdf>

¹⁰ The report of the Technical Expert Group on Sustainable Finance (TEG) lists waste heat as an economic activity that makes a substantial contribution to climate change mitigation, the report will feed into an EU legislation establishing a unified classification system for sustainable economic activities; https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf

¹¹ See: <https://www.mdpi.com/2076-3417/9/15/3142>