INTREPIDH

Funded by

Danish Energy Agency

Industrial Process Heat Supplied By District Heating

Recommendations for a more affordable energy transition

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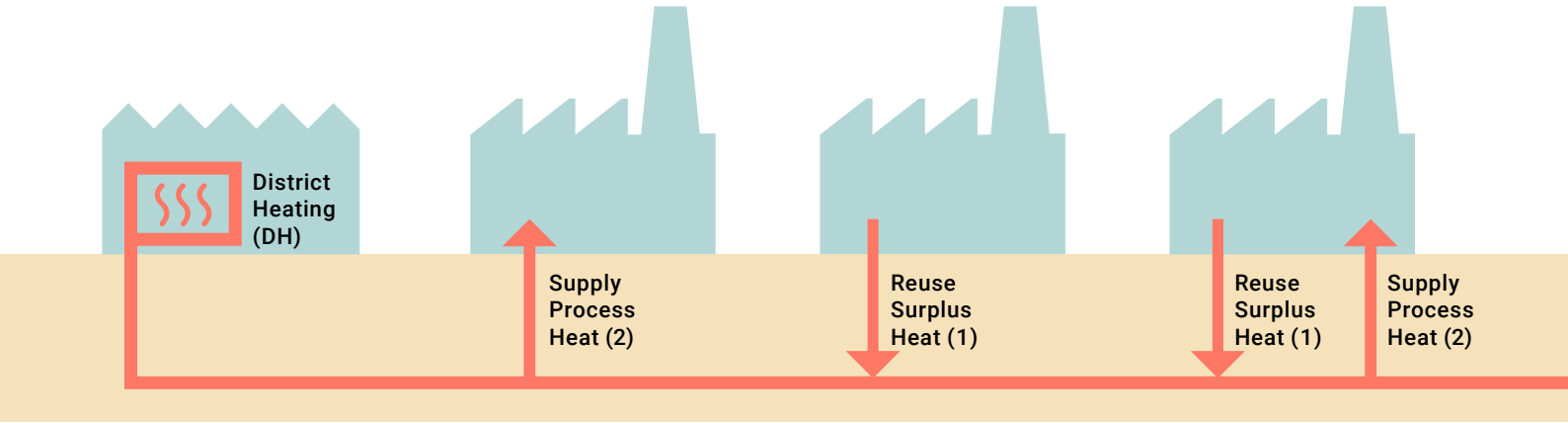
Unlock faster & affordable transition
Background

An overlooked solution

A wide range of temperatures are required in the industrial processes. Some sectors are well-suited for supplying surplus heat and other sectors are well-suited for receiving process heat.

Nothing is more convincing than seeing things work and making money. Therefore, the INTREPIDH project, funded by the Danish Energy Agency, has collected experiences and descriptions from twelve cases across five countries in a best practice catalogue. The catalogue shows that a variety of industries and DH systems form successful business collaborations and that this is part of the journey towards a breakthrough on much larger scales.

For Europe to benefit from this, see the recommended actions for municipalities, energy agencies, district heating provider, and industry on the following pages.



What is process heat based on DH?

- Process heat is the energy needed to drive industrial processes, and it is often based on natural gas or coal. In the future, process heat can be supplied by a mix of electricity, local DH, biogas, and certified biomass, as many manufacturers seek more competitive and sustainable alternatives.
- Examples of process heat at moderate temperatures include drying, food processing, cleaning, and chemical reactions. Whereas metal-processing requires much higher temperatures.
- **Surplus heat (1)** from industrial processes can be reused in district heating systems which should not be confused with **process heat (2)** that can be supplied from district heating to the industrial sites.

Collaborations across sectors
Best practice catalogue

It is possible!

There are multiple ways to use low-carbon district heating as a heat source for industrial processes, which emphasizes the vast potential for this energy setup. In some cases, DH covers a large proportion of the heat demand, while on-site equipment handles peak loads or specific high-temperature steps.

Learnings

- The food and beverage sector is particularly well-suited to use district heating to replace natural gas.
- The business case for new district heating areas can improve when the heat supply to the process industry is included.
- The concept has stood the test of time, with projects being in successful operation for many years.
- It pays off for district heating companies to reach out and establish a good dialogue with the local industry.
- The cases show that the initial dialogue was often focused on the reuse of surplus heat but ended up bringing a valuable solution for process heat instead.
- Boosting district heating with high-temperature heat pumps is a strong solution, making it possible to deliver heat at temperatures above 200 °C. The development of high-temperature heat pumps is a hot research topic, with operating temperature ranges and efficiencies increasing.

Download here:
[Best Practice: Process Heat for a Green Industry | DBDH ↗]

Recommended actions
Municipalities

Why ?

Municipalities have a key role and will benefit from being active. The collaboration of DH and Industry in urban areas boosts the local economy and can attract local employment. Accelerating the co-transition of industry and heating sector will help to achieve climate goals and increase acceptance of the heat plan.

How

- Include the industrial sector in the municipal heat plan. Investigate both, the potential of surplus heat and process heat.
- Raise awareness locally:
  - Arrange networking events to bring together Industry & DH
  - Develop a municipal checklist for new industry that includes a dialogue with DH
  - Have a municipal contact person to ensure continuous dialogue
- Develop a local vision: facilitate working across silos and push for an integrated strategy.
- Ownership strategy: apply the role of DH-ownership if possible and push for collaboration with the industry.
- Local data & knowledge hub: collect and provide the knowledge and data needed to increase the sector integration.
- Connect with external institutions as multiplicators and for support (Universities, energy agencies, other municipalities etc.)

Recommended actions
Energy agencies

Why ?

Politicians, industries and municipalities will reach out to the energy agencies for answers about potentials, cost effectiveness, energy savings, security of supply when combining process industry and district heating. Energy agencies hold a unique position to identify barriers, build knowledge and suggest solutions to unlock the synergies.

How

- Be facilitator and act as point of contact:
  - Serve as a point of contact for the topic, through designated contact persons or departments
  - Facilitate contact between the parties involved (DH, industry, municipality) and enable long-term trusting relations
  - Link between actors and political decision makers
- Provide information and enable knowledge-sharing:
  - Disseminate information material: guidelines, checklists, publications, materials on funding, best practice examples etc.
  - Explore the existing solutions and identify barriers and potentials
- Collaborate with other energy agencies in Europe: Share and build knowledge about technical and regulatory solutions that can be applied nationally or across Europe.

Recommended actions
District heating provider

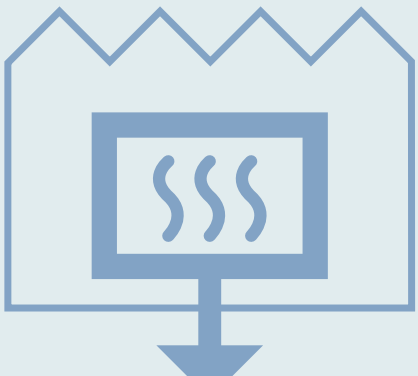
Why ?

The process industry is an attractive new type of costumer and can help to make DH more robust and cost-effective. Delivering process heat to local industry leverages existing infrastructure and production capacity, especially during summer months. This can accelerate investments in additional low-carbon heat production.

By supporting local industry with affordable solutions, DH is gaining an ally for joint green solutions. This will increase the social acceptance for DH.

How

- Explore the opportunities: The process industry is a new and attractive type of customer, so incorporate it into your strategic plan.
  - Existing DH: Identify large industrial heat consumers near your supply area.
  - Establishing new DH: Industrial process heat could provide the anchor load, making the business case feasible.
- How to reach out to industry:
  - Expand the dialogue: Include not only surplus heat but also process heat in the same discussion. Discuss openly and in depth.
  - Go for win-win: Co-create tailored contracts to match the customers' risk profile, size, and temperature with the design of the DH system.
  - Think long-term & be persistent: Demonstrate reliability and long-term value of the emission-free energy supply. Not all industrial companies are immediately ready to join – timing matters, keep trying.
- Teaming up with the local industry and municipality to raise awareness of joint green solutions. Talk about it in public and make communication efforts.



Recommended actions
Industry

Why ?

European industry is struggling with three challenges simultaneously: Energy efficiency, affordability, security of supply. A combined solution including sustainable district heating is more diversified and robust than a solution based on pure electrification.

It is worthwhile investigating when designing your green transition plan to assess the potentially lower investment costs and more stable heat prices.

How

- Reach out to local DH operator and discuss both surplus and process heat (discuss annual consumption, peak power, load profile and temperature levels)
- Discuss potential benefits internally:
  - For the management:
    - OPEX and potentially CAPEX savings
    - Security of supply through reduced dependence on natural gas
    - Reduction in carbon emissions
    - Flexible business models are available
    - Better public image
  - For technical experts:
    - Save space on production site, as heat production is part of the DH-system
    - Advantages in operational management compared to alternatives
    - Access to expertise through DH operator

Outlook & Contacts

How to use this document

- Share it to create dialogue and awareness in general.
- Discuss the recommendations with the actors involved.
- For the big picture and success stories read the Best Practice: Process Heat for a Green Industry | DBDH ↗
- Reach out to anyone from the project team for further information!

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