Interreg Vlaanderen-Nederland

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FACILEX

Grensoverschrijdende uitwisseling van warmte in North Sea Port

Gieles Kinget

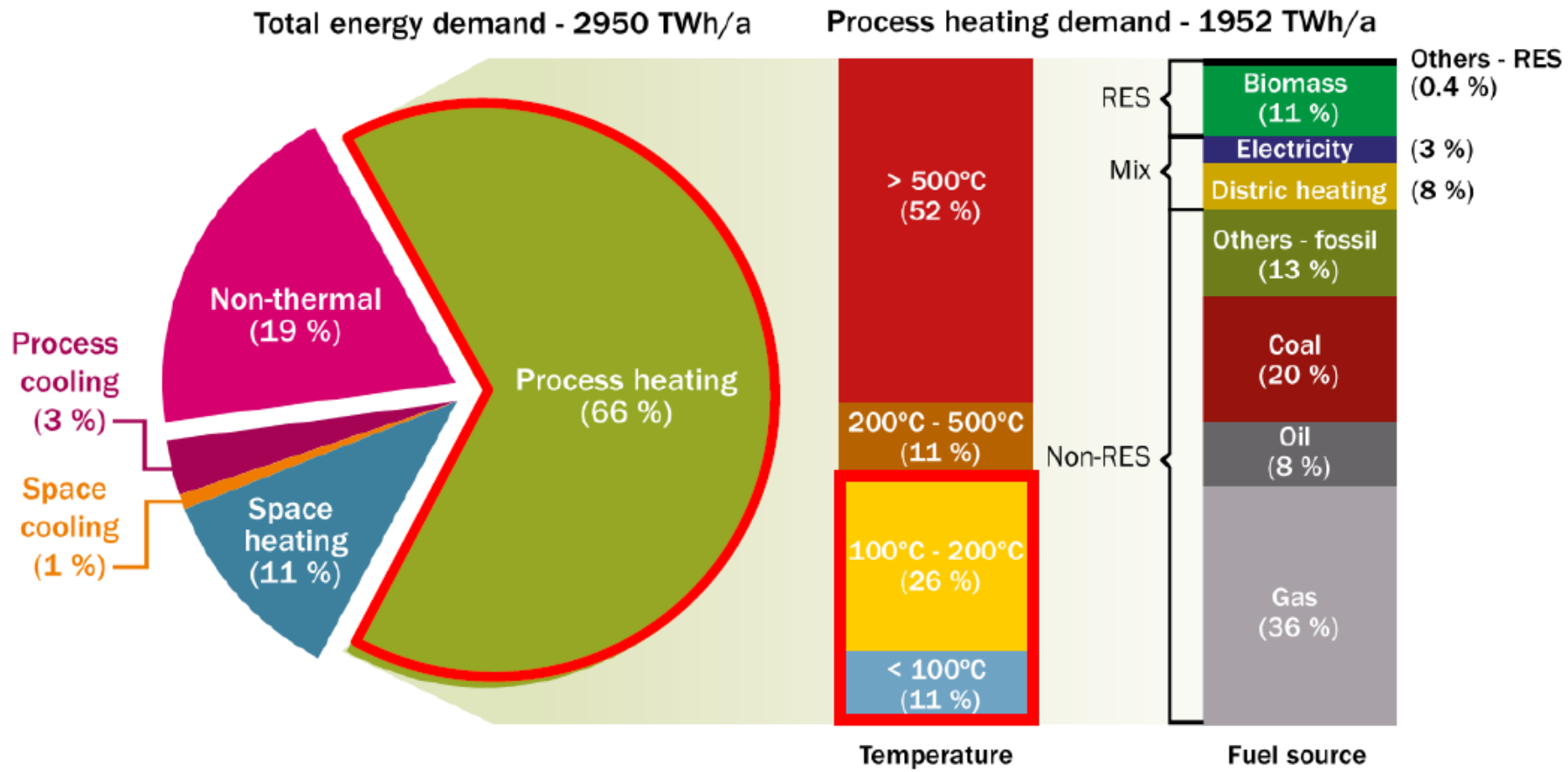
POM Oost-Vlaanderen

smart delta resources

North Sea Port

Havengebied North Sea Port

INDUSTRIAL ENERGY DEMAND IN EUROPE



De Boer et al. (2020)
HeatRoadMap (EU 2015)

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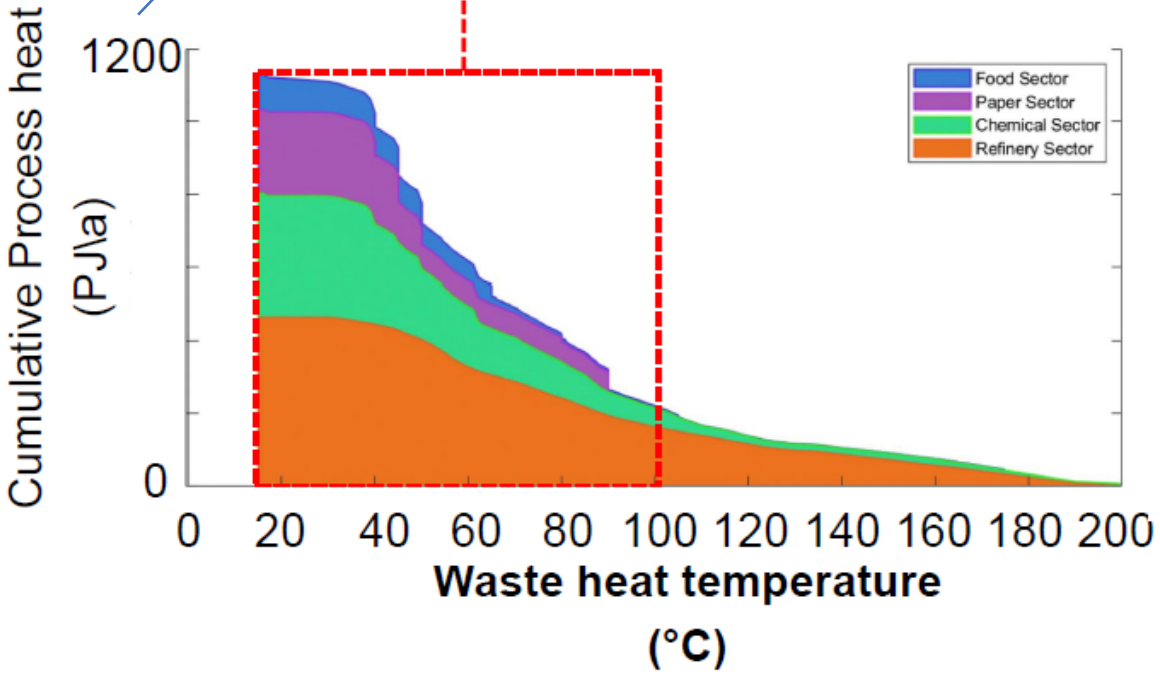
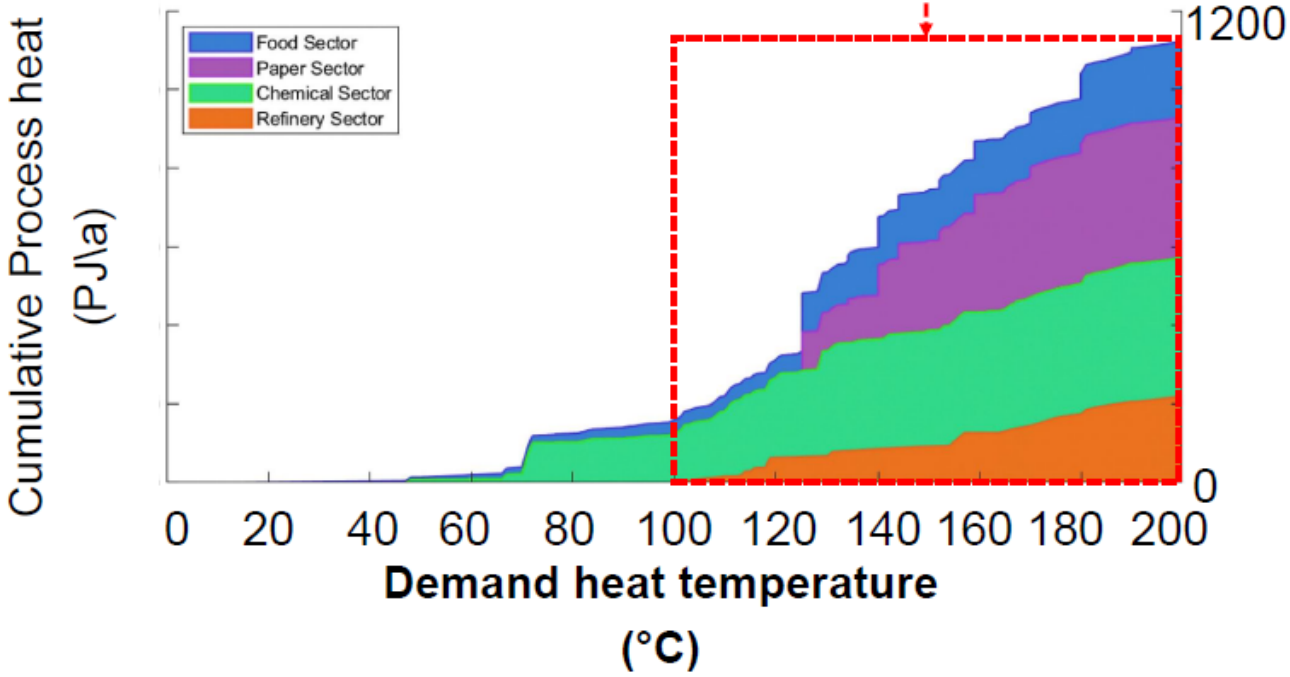
MATCHING COOLING (RESIDUAL HEAT) AND HEATING

333 333 GWh

Heat pump technologies





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Marina et al. (2021)

ELECTRICITY / FOSSIL-FUEL PRICE RATIO

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Latvia	2.7	7.5	2.78	2.5	73
Hungary	2.5	7.0	2.80	2.5	73
Greece	2.5	7.5	3.00	2.7	66
Poland	2.4	7.2	3.00	2.7	66
Romania	2.3	7.0	3.04	2.7	65
Croatia	2.3	7.2	3.13	2.8	63
Belgium	2.0	6.8	3.40	3.1	56
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Deep Dive Application Potential by C. Arpagaus

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Deep Dive Application Potential by C. Arpagaus

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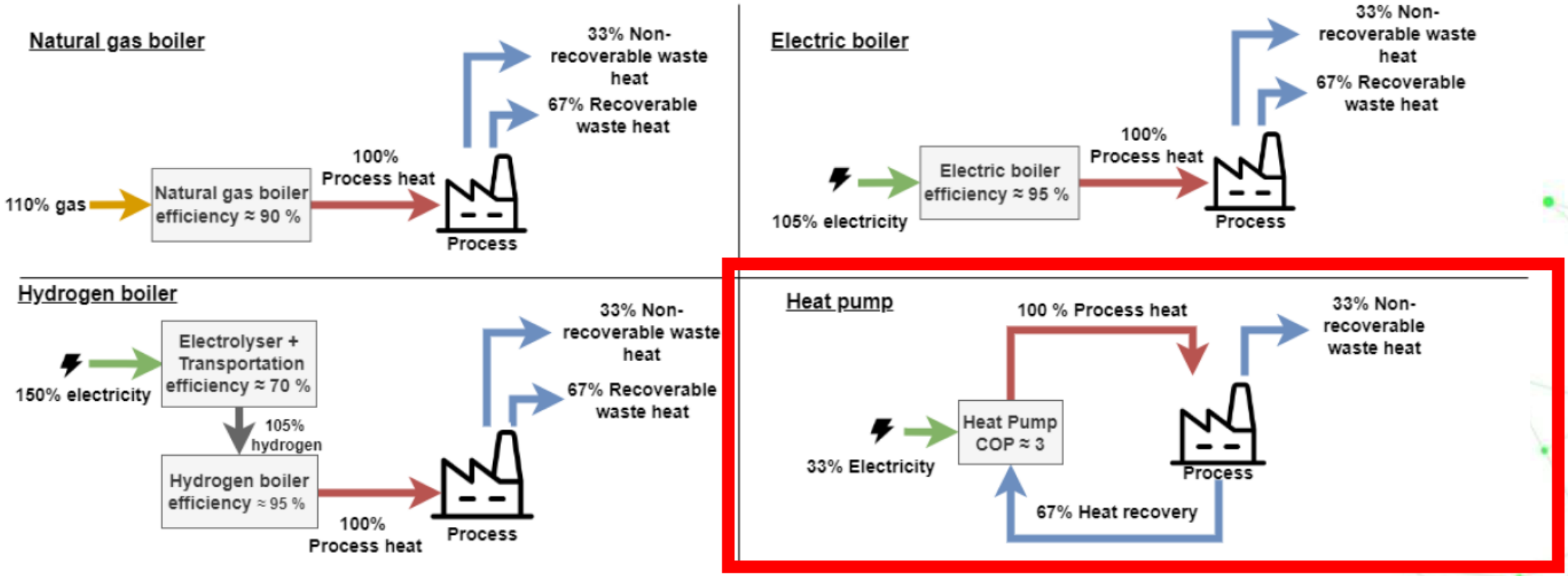
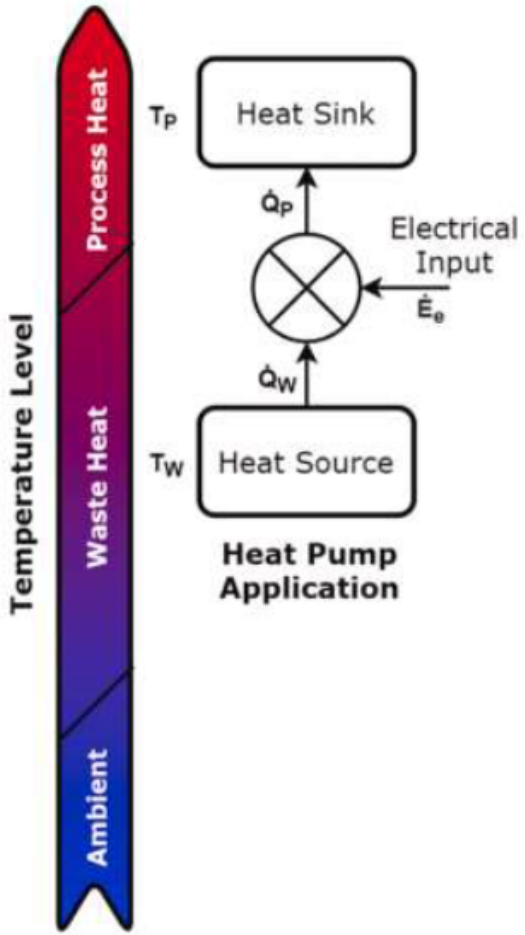
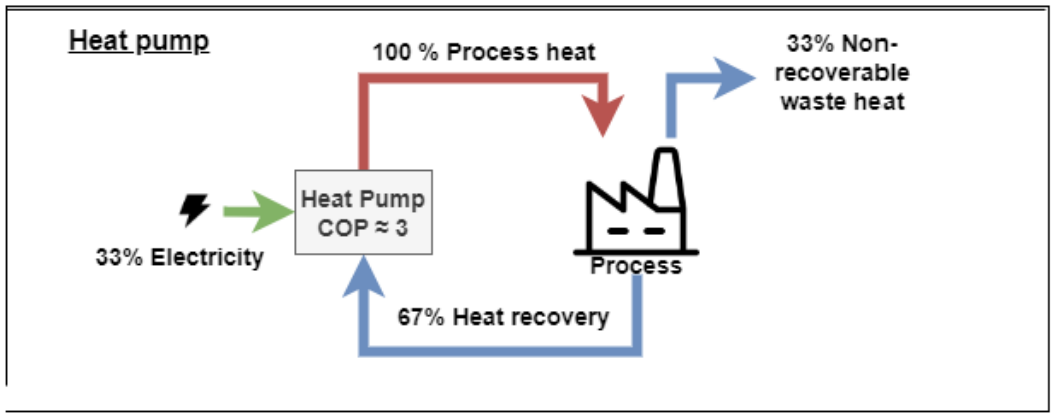
North-C Heat Project

Objective : Production of sustainable heat based on waste heat network in combination with de-centralised high temperature Heat Pumps (option 4)



Industrial Heat Pump Technology



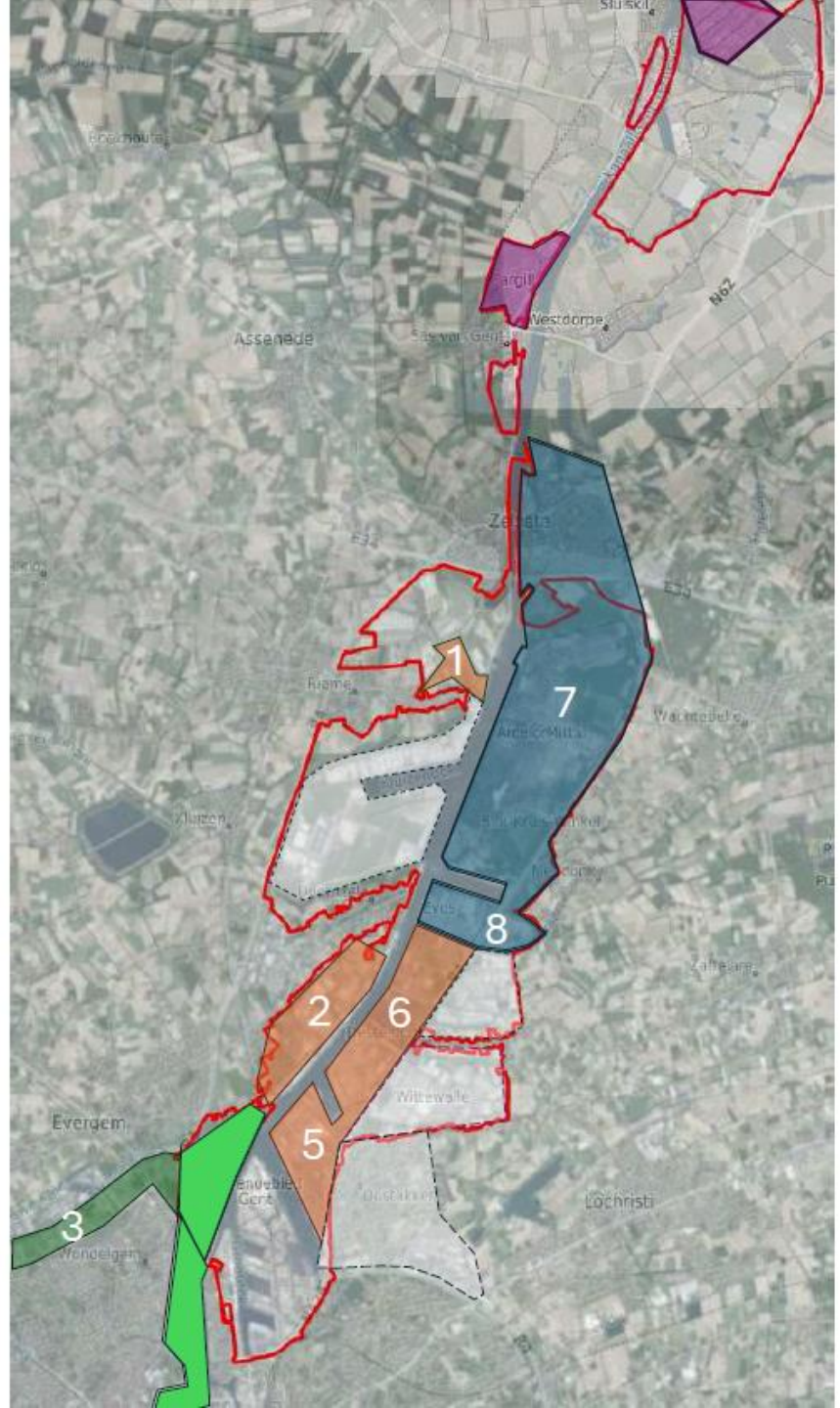


Current Industrial Heat Pumps

- Upto 150°C steam production
- With Vapor Recompression 200°C and more possible

COP = Heat Production (Qp) per MWh Power comsumption (Ee)

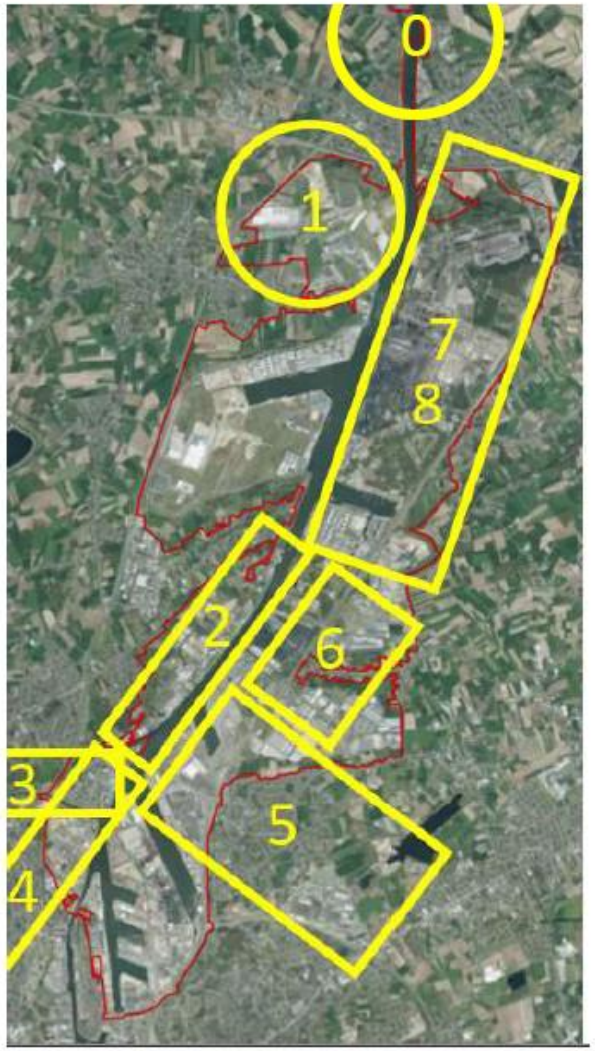
- Increases with higher Heat Source (Waste heat)
- Lowers with higher Steam Temperature (More recompression
- Typical between 2 and 5 (76% of industrial cases)

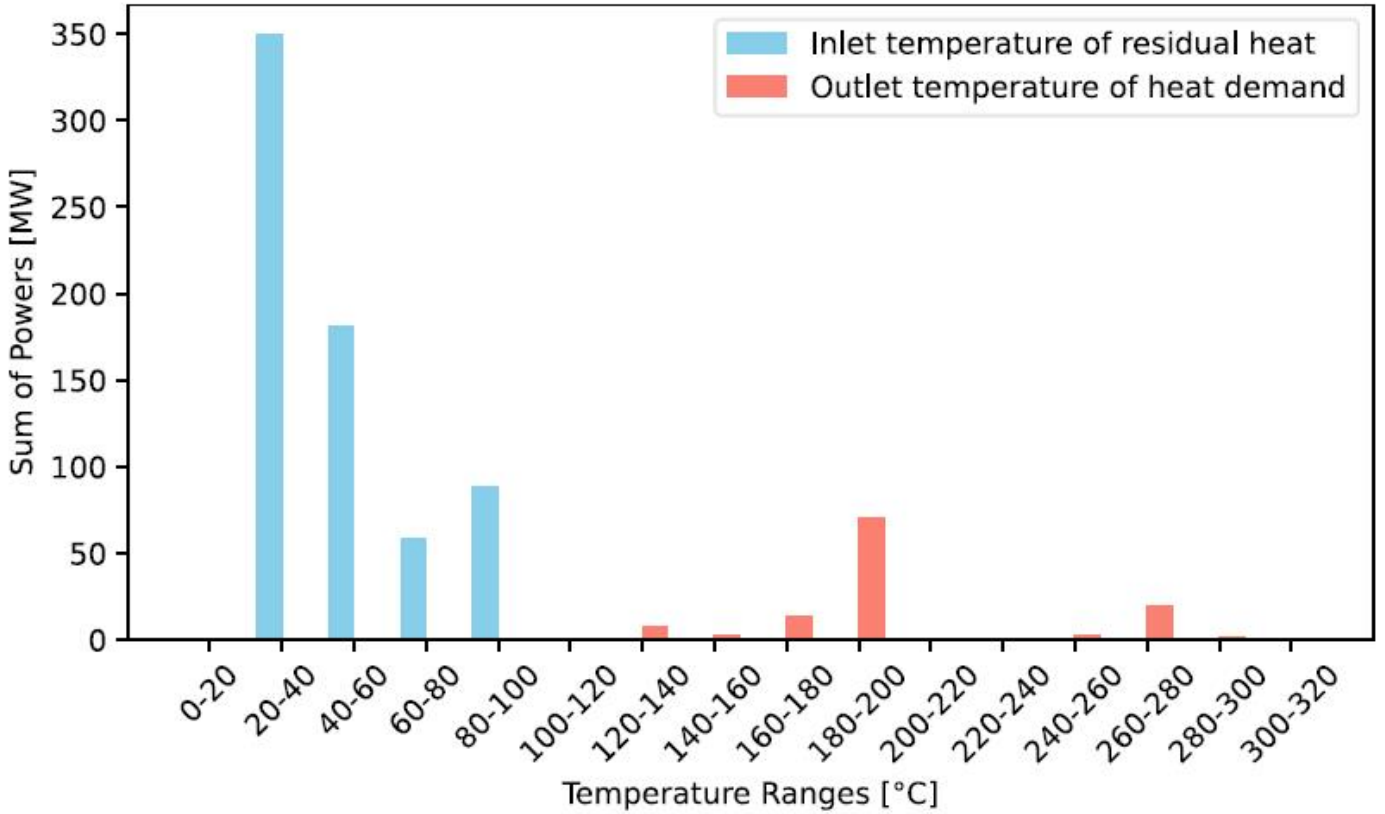

Assenede
Zelzate
Evergem
Wondelgem
Lochristi
1
2
3
5
6
7
8

North-C Heat Configuration

First Cluster Studied : around ArcelorMittal Gent

ArcelorMittal Gent has a number of direct accessible waste heat sources cluster around ArcelorMittal Gent





North-C Heat Project
Maximum Configuration from Sas van Gent until Rodenhuize

Heat Pump Capacity

Steam 200°C

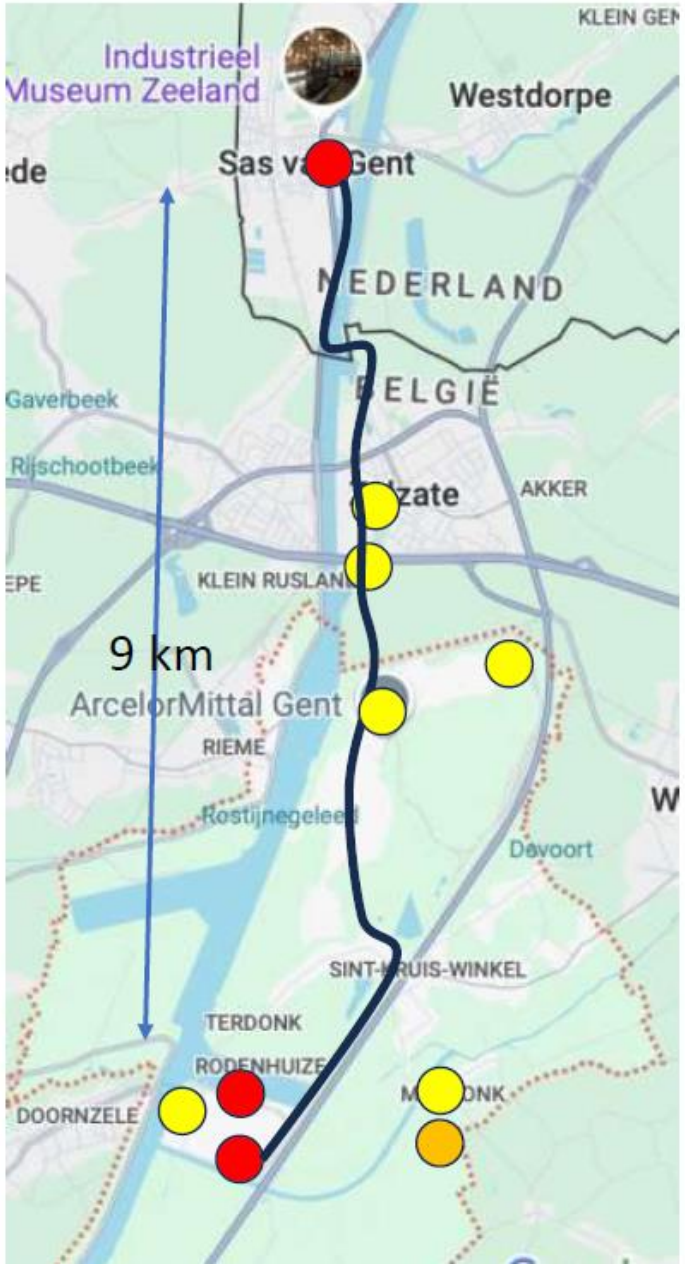
Steam 160°C

+ Hot Water

Totaal 114 MW

Waste Heat Temperature Network

80°C inlet and 60°C outlet



Piping for Hot Water

Backbone length = 13,8 km (x 2)

Distribution pipes = 1,8 km (x 2)

First high level **results** simulations

> 129.000 K CAPEX

> 162.000 tonnes CO2 reduction/Yr

Heat extracted total [kW]	68081
Electricity use [kW]	39871
Heat delivered [kW]	107952

COP (Only steam delivered)	2,3
System COP (steam and warm water delivered)	2,7

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ELECTRICITY / FOSSIL-FUEL PRICE RATIO

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- Electricity price/natural gas price
  - 95 EUR per MWh / 30 EUR per MWh
  - = 3,16 no good case possible in Belgium
- Electricity price / natural gas price + CO2 price (75 EUR/tonne)
  - 95 EUR per MWh / 30 + 15 EUR per MWh
  - = 2,11 positive case is possible in Belgium

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Conclusions

- Only economically interesting when system COP > electricity price / Natural Gas costs (+ CO2 price)
- The need for a trusted platform such as SDR is essential in order to collect and also share data
- CAPEX for piping, heat exchangers, pumps, …: need for bilateral conversations to go in depth. Also a need to work together with North Sea Port to determine the trajectory and thus CAPEX for piping.
- Probably a need for subsidies/public funding to realize this first of a kind project with that scale of industrial heat pumps (>100 MW)
- Connecting of the two initaitives
  - starting from NL in Terneuzen and develop towards Sas van Gent
  - Starting from BE in AMG and develop towards (Sas van) Gent

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Next steps

- Letters of intent
- Data collection + modelling for the other (cross border) clusters
- Deepening of dialogue with potential developers and technology providers

Ondertussen in Nederland

- Samenwerkingsovereenkomst voor haalbaarheidsonderzoek
  - Ondertekend door Dow, Warmco, NetVerder, VoltH2, Gemeente Terneuzen, Provincie Zeeland, North Sea Port en Smart Delta Resources.
  - Restwarmte van DOW en VoltH2
  - Netverder als ontwikkelaar en beheerder (Wet Collectieve Warmte)
  - Opmaak scenario's, keuze technologie(ën) en uitwerking businesscase

28 juni, 2024

Belangrijke stap richting nieuw warmtesysteem Kanaalzone Gent-Terneuzen

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Grensoverschrijdende uitwisseling van warmte in North Sea Port: belemmeringen?

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- **Juridisch**: Vlaanderen en Nederland hebben elk hun eigen energiewetgeving en vergunningenbeleid.

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akd | Wet collectieve warmte

Vlaamse industrie vraagt fors minder vergunningen aan

VREG ENERGIE WIJZER

fluvius.

'Er is meer en meer munitie om op vergunningen te schieten'

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- **Administratieve en bestuurlijke samenwerking:** de verschillen in aanpak en overlegstructuur maken grensoverschrijdende samenwerking voor energieprojecten bijzonder complex.

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Stimulering Duurzame Energieproductie en Klimaattransitie (SDE++)

VLAIO

Rijksdienst voor Ondernemend Nederland

- **Financieel**: Vlaanderen en Nederland hebben hun eigen steunprogramma's voor hernieuwbare energie. De verrekening van CO2-rechten voor grensoverschrijdende uitwisseling is niet geregeld.

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- [illegible]ederland hebben hun eigen st[illegible]unpro[illegible]rrekening van CO2-rechten voor [illegible]eling is niet geregeld.
- **Infrastructuur**: het elektriciteitsnet en pijpleidingen worden ontworpen en aangelegd tot aan de grens, los van elkaar. Dit belemmert de ontwikkeling van nieuwe hernieuwbare energieprojecten.

Interreg Vlaanderen-Nederland

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