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Assessment of industrial heat pump integration and waste heat availability using representative profile

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## Goals

Development of methods and tools for rapid estimation of process requirements, energy conversion technology potentials, and waste heat availability.

Swiss energy research for the energy transition

Demonstration of the use of exemplar profiles and ullet**representative profiles** developed using Pinch Analysis principles.

## Method

#### **Exemplar profiles**

Exemplar profiles are generated using specific energy demand estimates for processes and mass balance

# **Problems**

- Limited availability of tools for **quick estimation** of process heating and cooling demands
- Absence of methods to efficiently scale process requirements for varying production capacities and seasonal fluctuations
- Lack of tools and methods for **rapid assessment** of energy conversion technology integration opportunities and waste heat availability

# **Results**

		Hot CC
Case study parameters	Values	
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Process	Candy	80 -



Production volume, operational time

### **Representative profiles**

Exemplar profiles are scaled up to represent various sizes or operating cases (e.g., winter, summer, transition) based on the production volume and operating hours

Energy conversion technologies

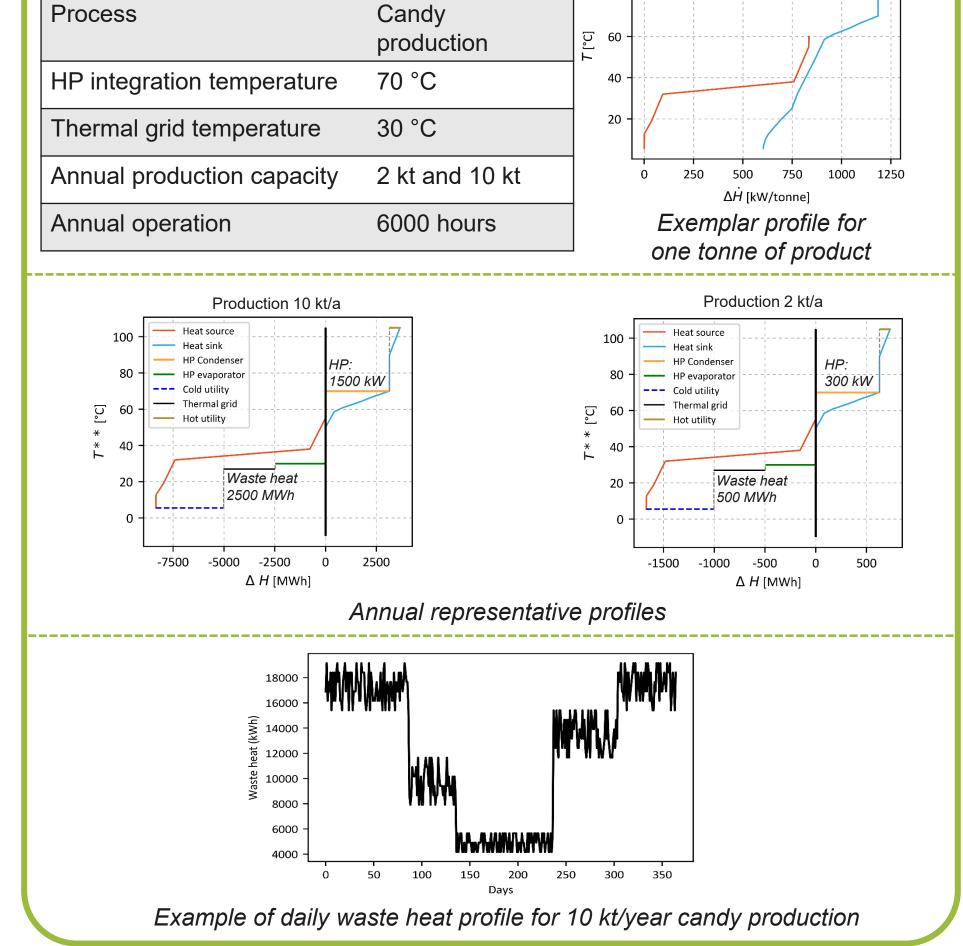
### **Technology integration**

Representative profiles are used to identify the integration opportunities for heat pumps and renewables (WP5)

Residual demands

#### Waste heat assessment

Waste heat available for various time resolutions (daily/monthly/seasonal) is estimated based on the production volume, operating hours, and residual demands after technology integration (WP3/WP1)



### Conclusions

- Pinch Analysis data in combination with specific energy demand allows the generation of exemplar profiles for products/processes.
- Exemplar profiles can be scaled to represent a given production volume or operating case.
- Representative profiles can be used to estimate energy conversion technology potentials.
- Representative profiles can be used to estimate the quantity of waste heat that can be used for thermal grids.

