HighLift by Olvondo

steam generating heat pump

May 2023

MAKE YOUR ENERGY GREEN

Lower your carbon footprint, increase your profit

Olvondo Technology at a glance

Olvondo Technology AS

- Norwegian technology company owned and supported by two Norwegian industry groups.
- Develops and manufacturers High Temperature Heat Pumps, HTHP for industrial use.
- Company set-up:
    - Holmestrand – Commercial office, headquarters , engineering and R&D
    - Bømlo – Service & maintenance, manufacturing and facility office

HighLift by Olvondo ©

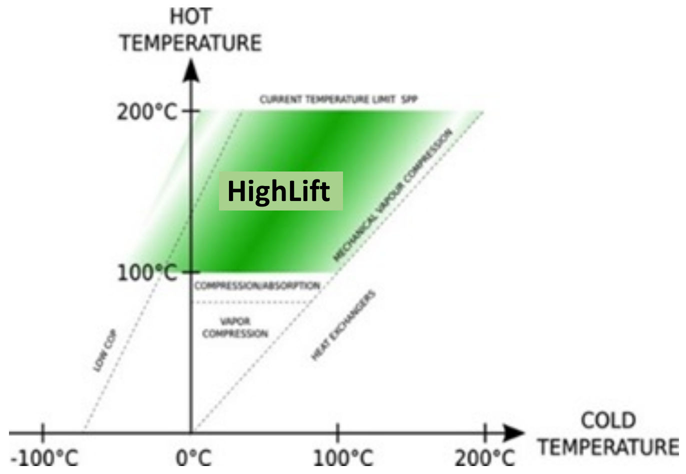
- Since the concept studies in 2004 the HighLift technology has matures till TRL9 .
- HighLift technology is currently in operations at pilot customers in the Nordic countries with more than 90.000 operational hours.
- The HighLift heat pump is now commercially available
    - Installation of steam producing heat pump in The Netherlands
    - Pre-studies ongoing within several European countries

HighLift by Olvondo – unique technology for renewable energy

Receive heat from a waste stream

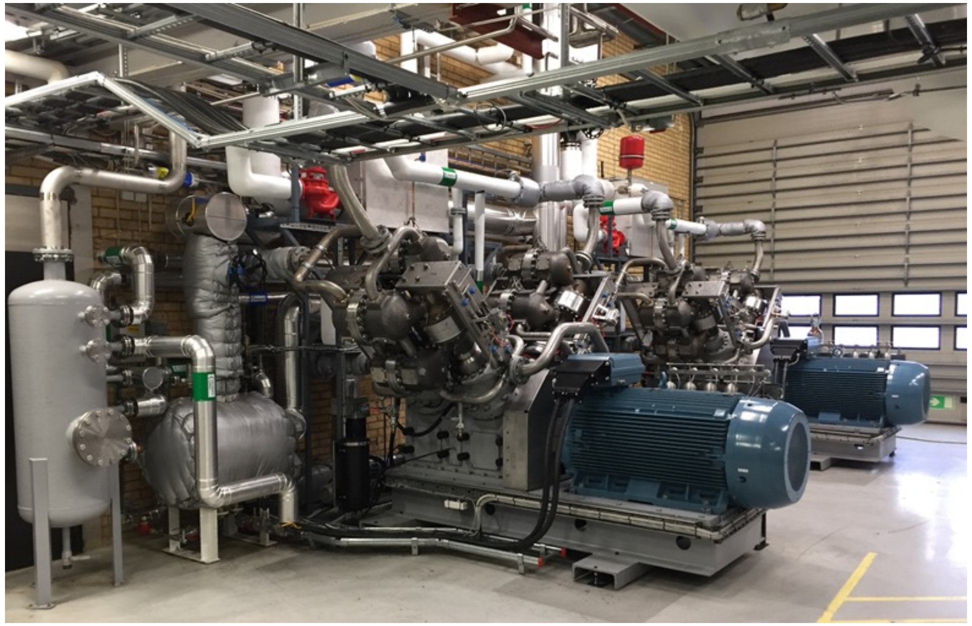
Extract and increase the heat from waste source

Deliver useful heat

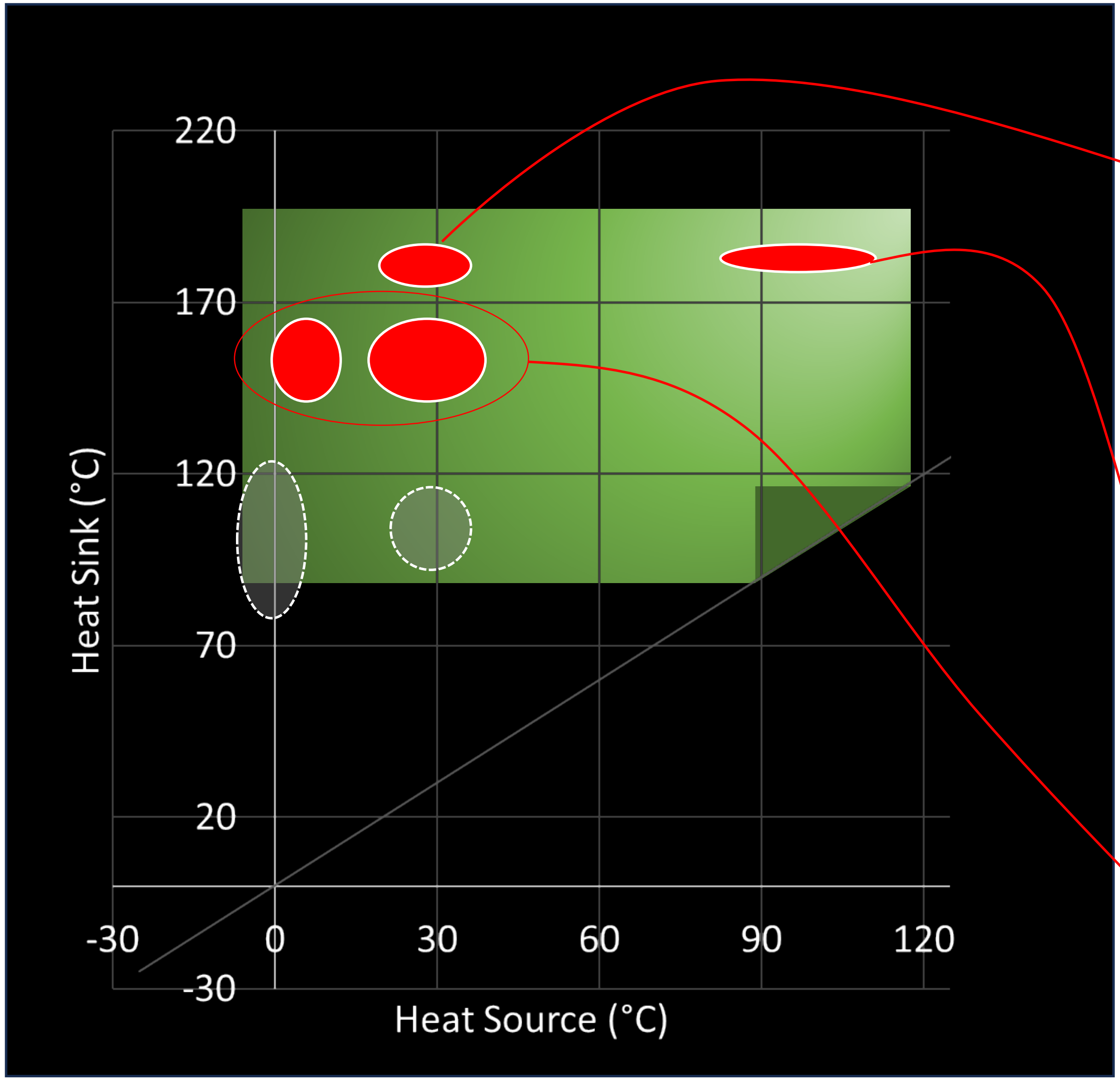


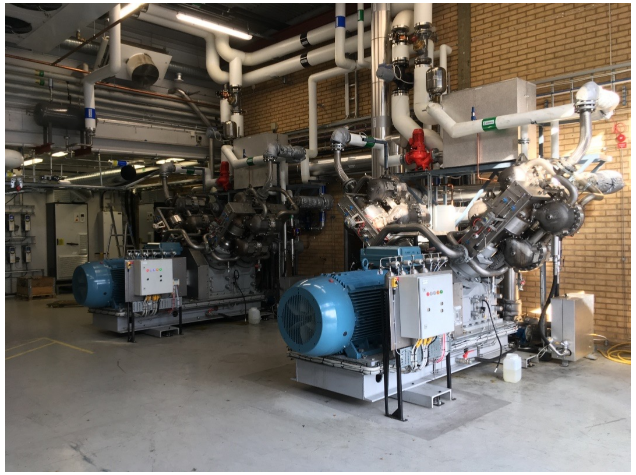
The HighLift high temperature heatpumps:

- recycle low temperature, low value waste heat to high temperature, high value process heat
- produce steam and cooling in one process
- use helium as working media
- enable high temperature lifts, delivering very high sink temperatures
- based on a reverse Stirling engine process



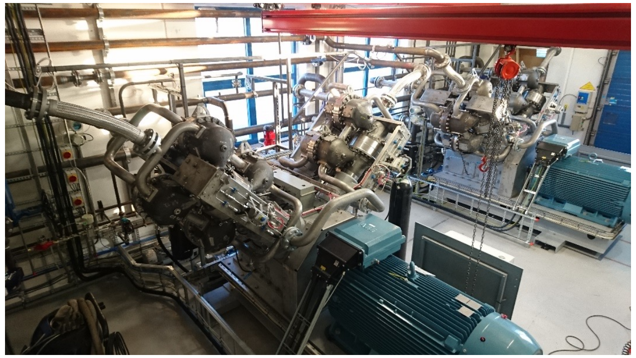
Heat pump installation examples





Hot side: 180°C (10 bar)
Cold side: 40°C

Heating: ~450-500 kW_{th}



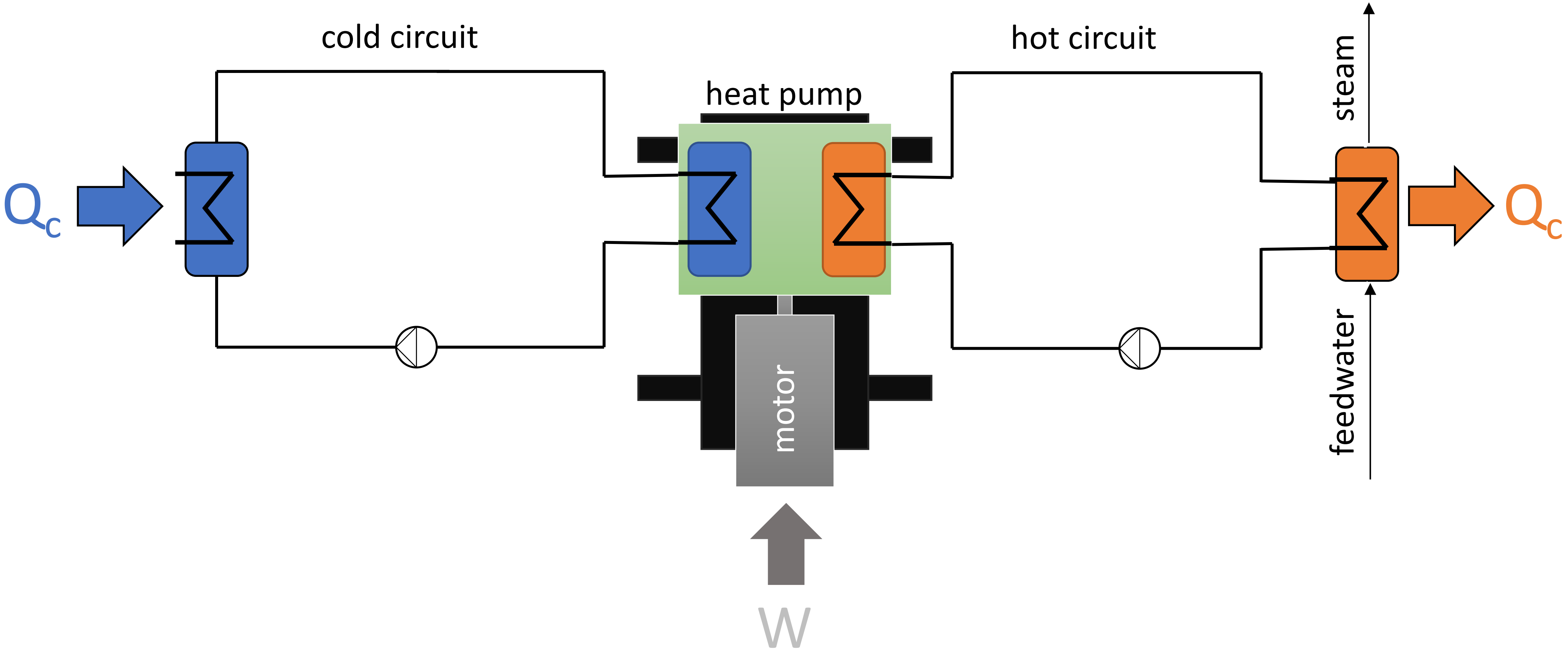
Hot side: 180°C (10 bar)
Cold side: 100°C (DH)

Heating: ~450-500 kW_{th}

Hot side: 170°C (6-7 bar)
Cold side: 10°C, 40°C

Heating: ~450-500 kW_{th}

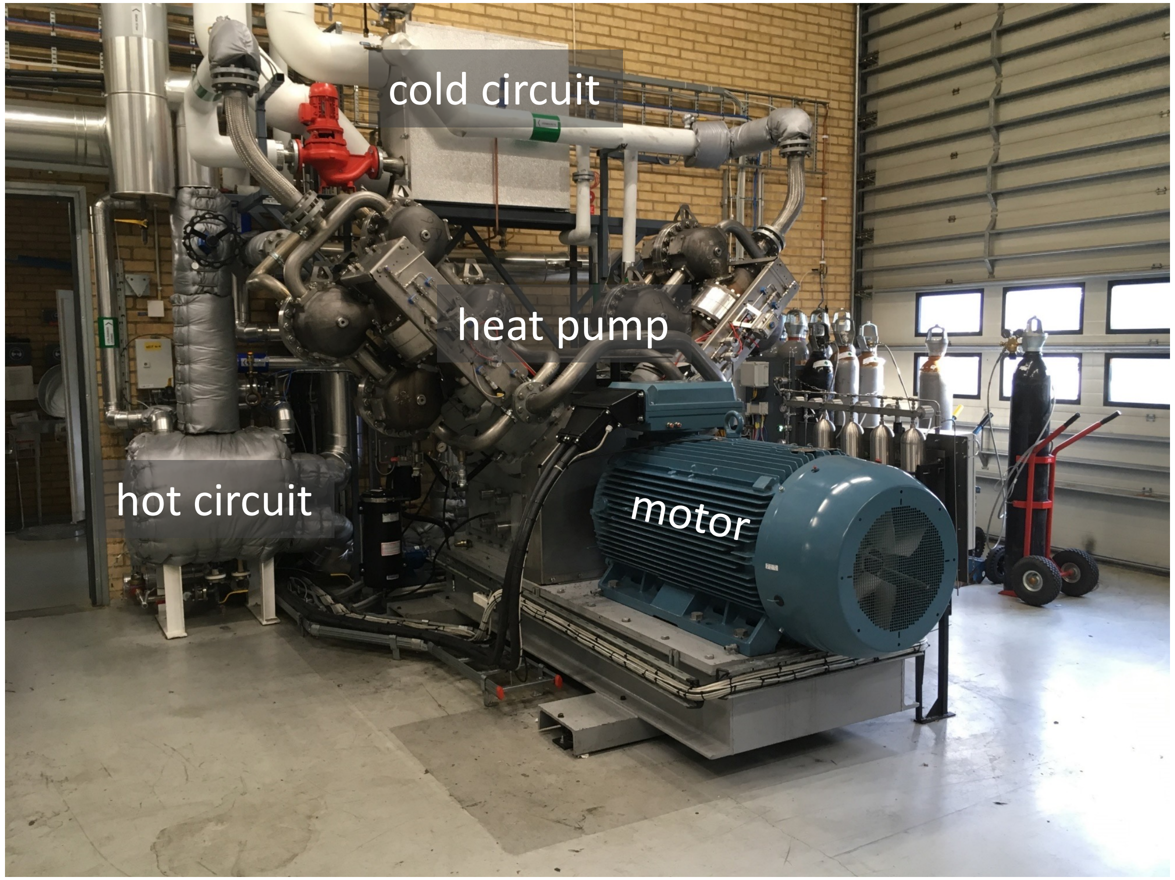
Typical installation flow sheet



Example of an installation

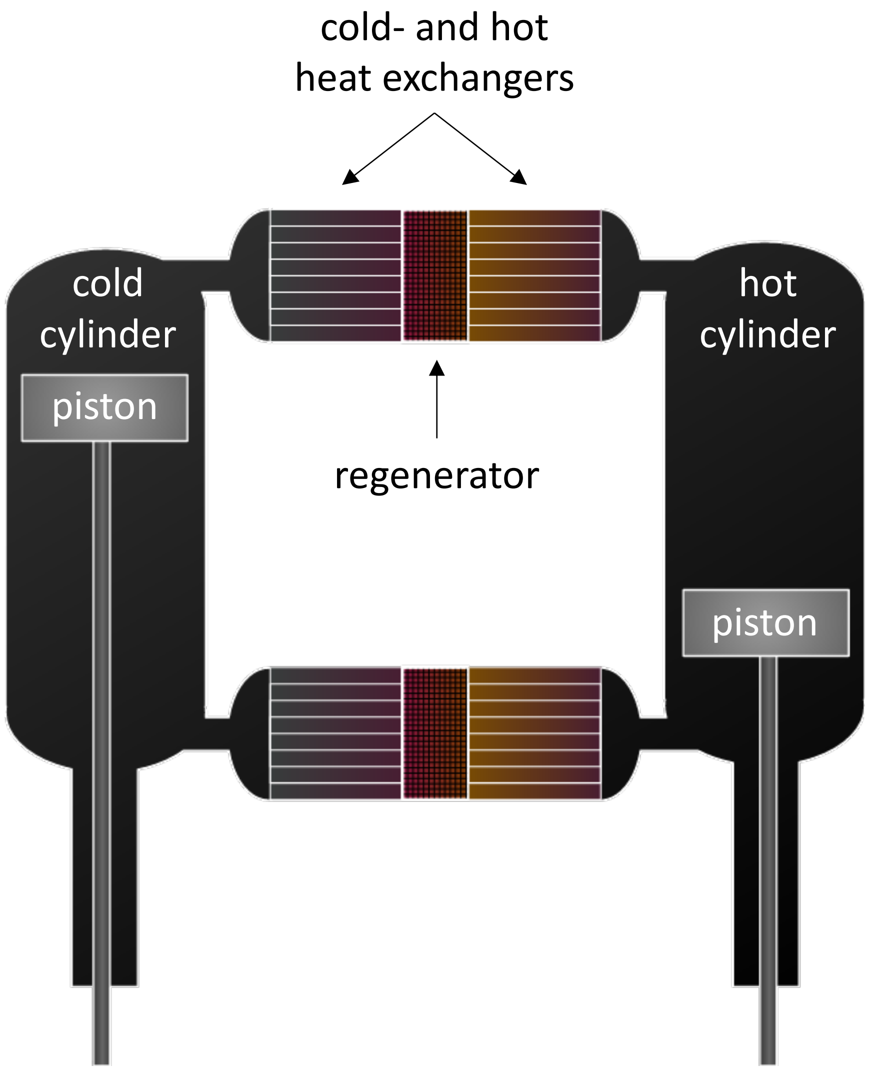
Main components:

- heat pump
- steam generator
- plate heat exchanger
- auxiliary circuits
- working-medium system

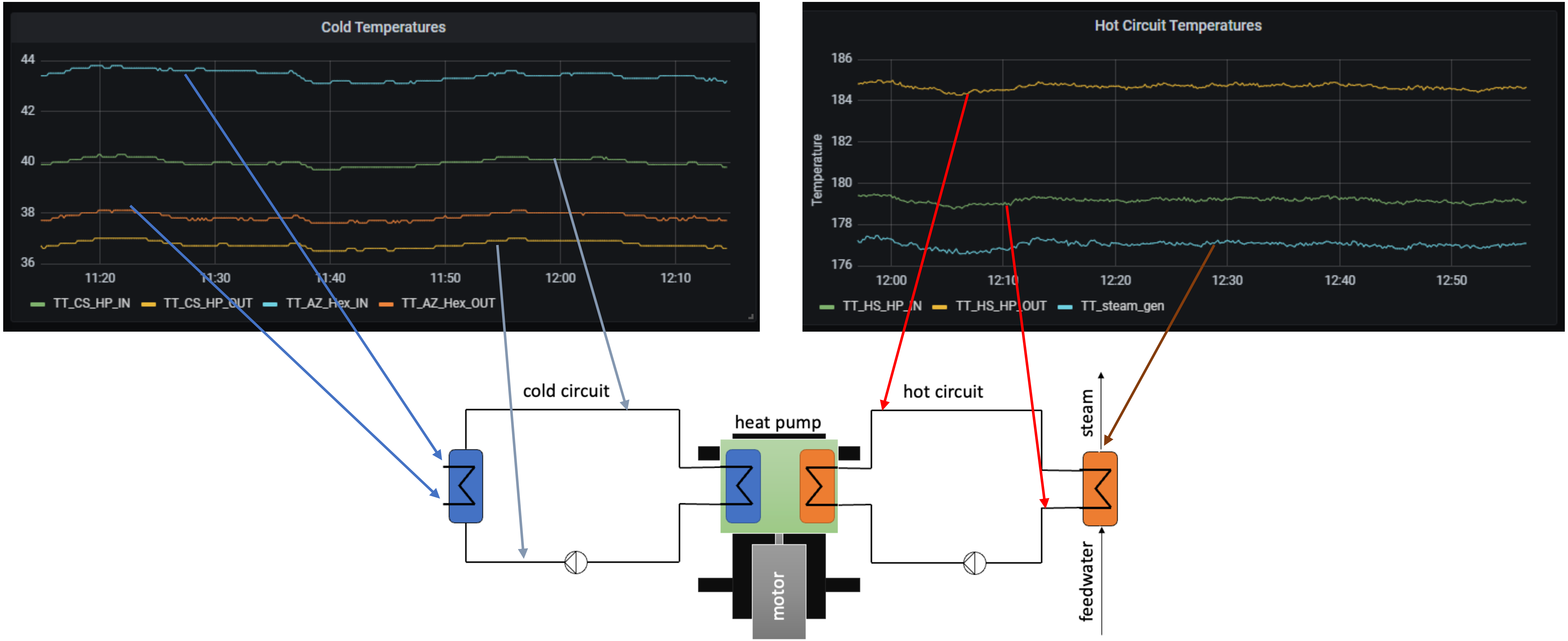


Process description

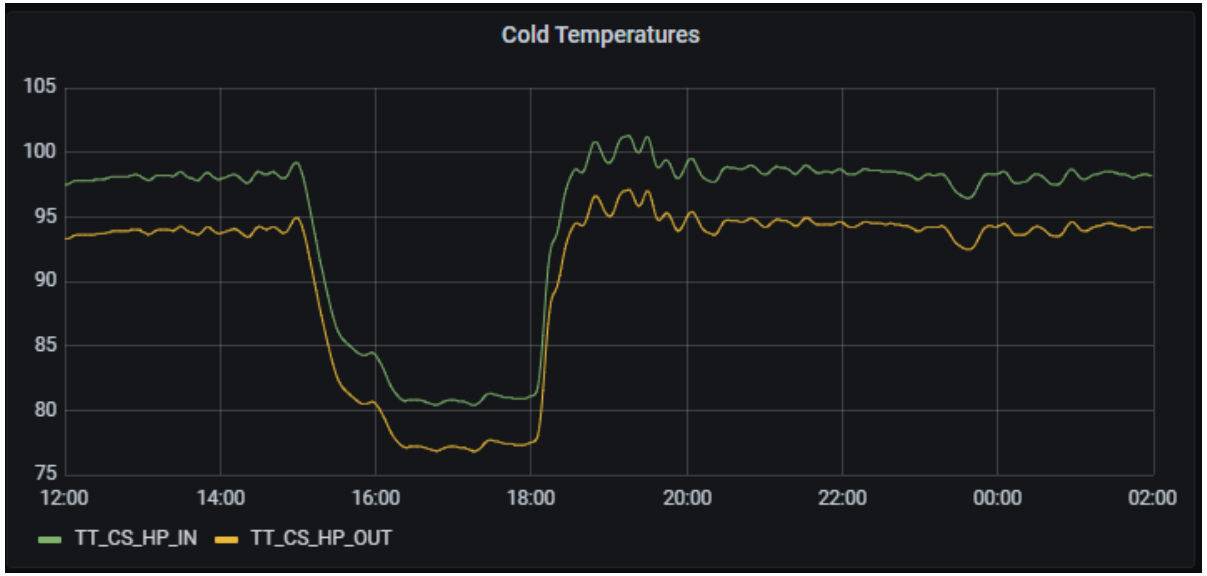
- Mechanical layout comparable to a 4-cylinder piston compressor.
- Working-medium a gas (He, R704).
- Heat transfer through water (from the working-medium).
- Self-adaptive to very large variation in temperatures.

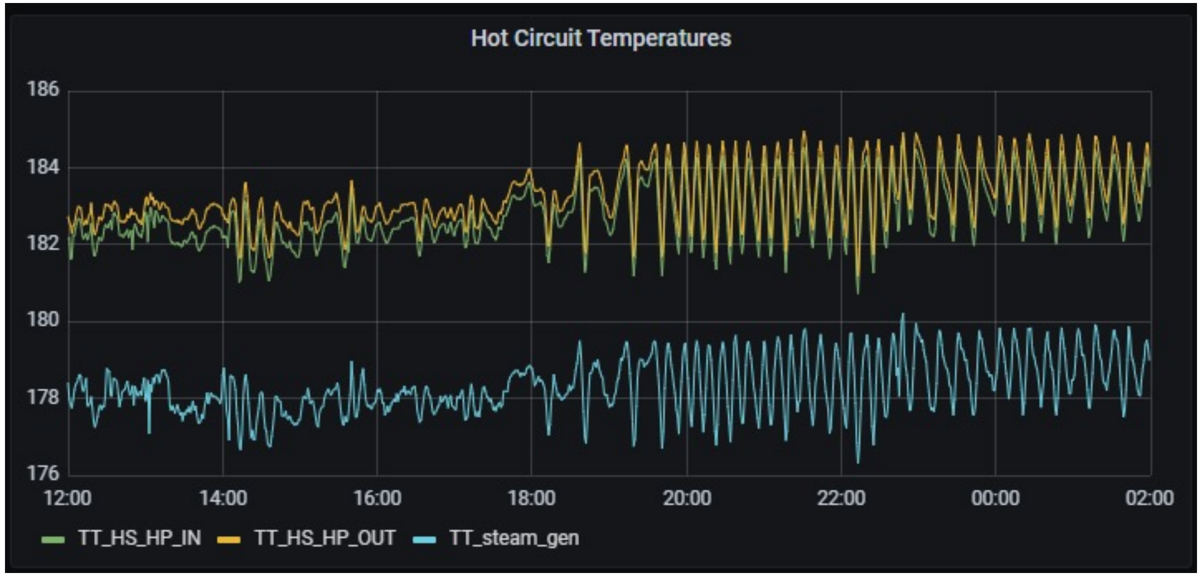


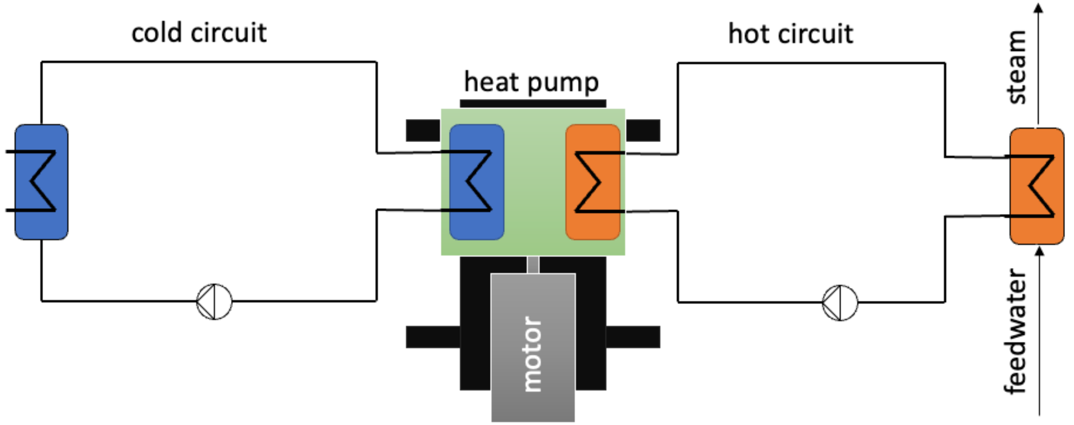
Operation metrics from an installation



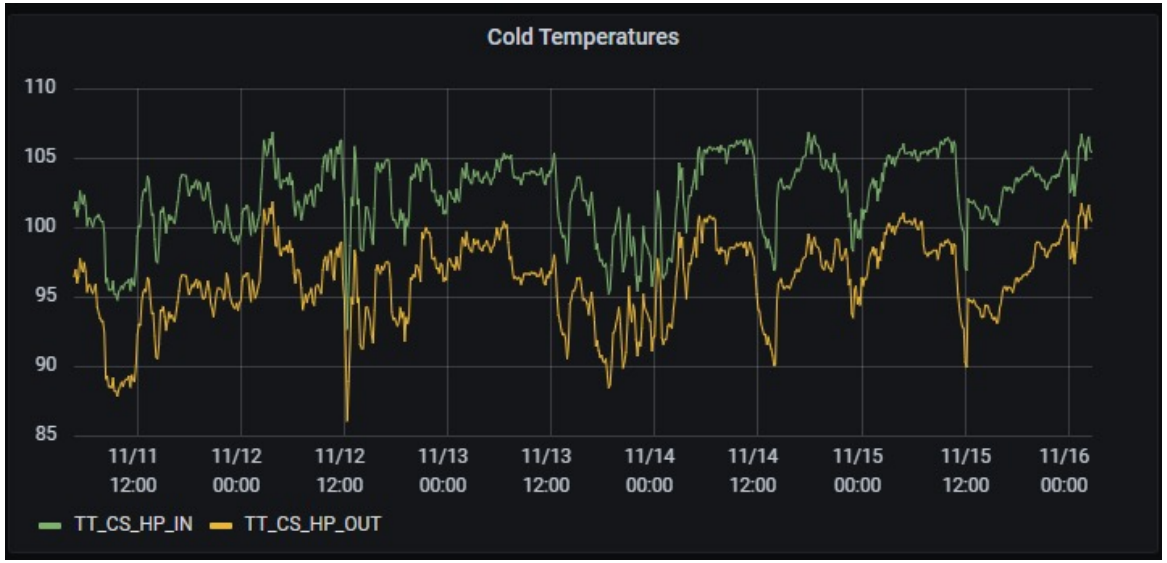
Operation metrics from an installation

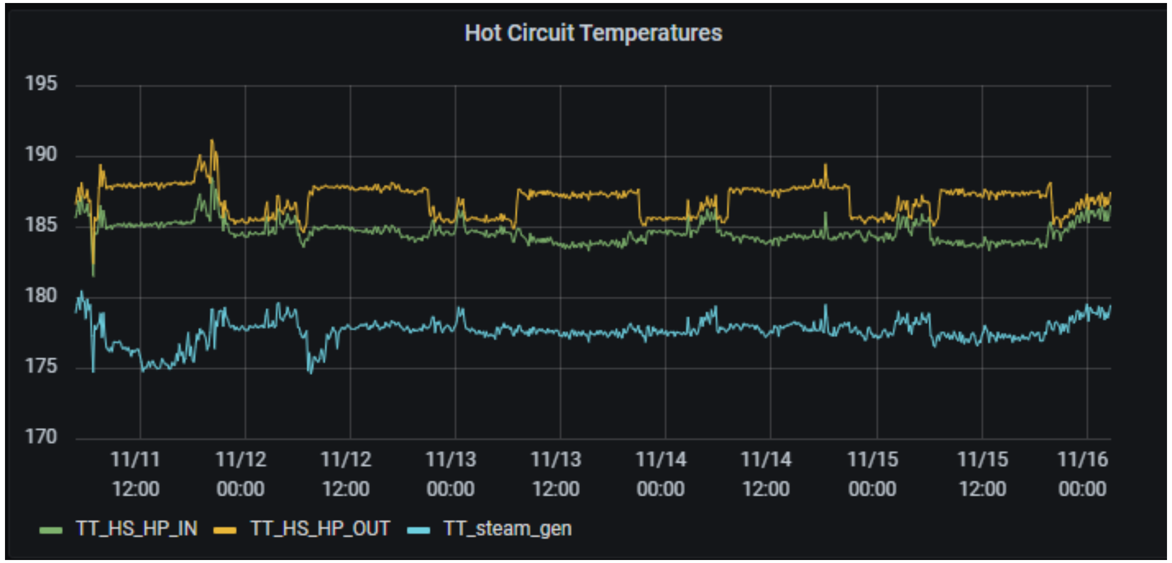


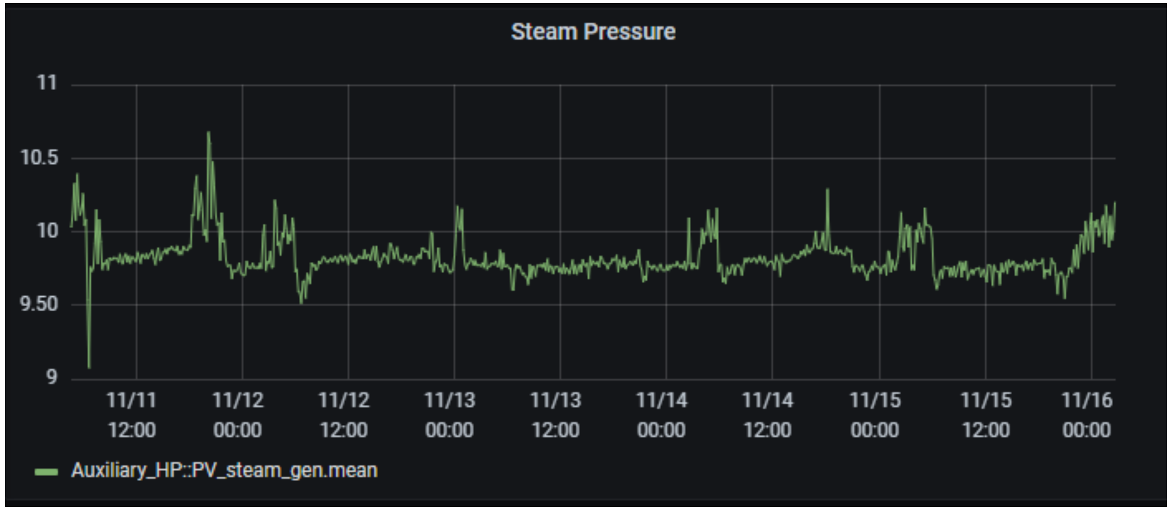




Operation metrics from an installation

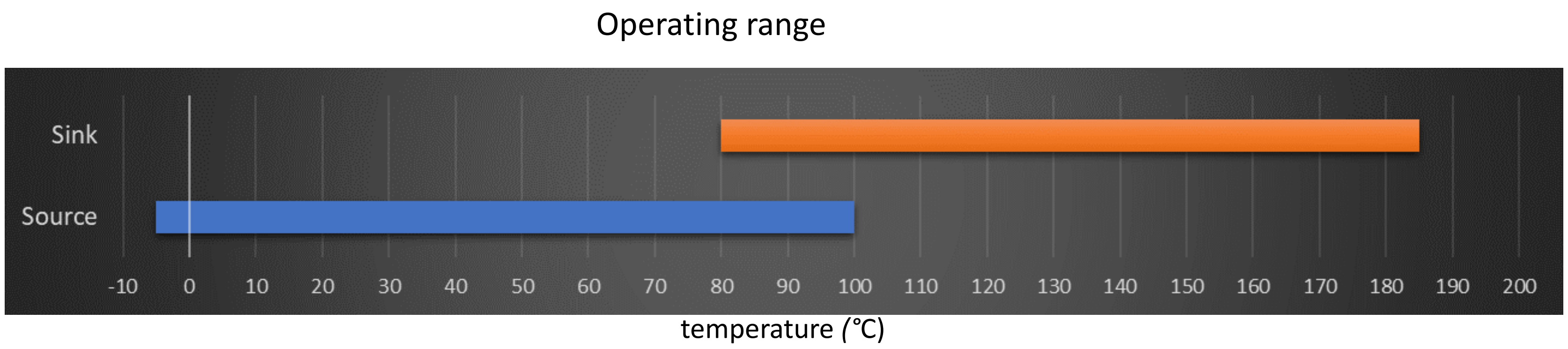






Winding up

HighLift by Olvondo – Commercial available steam generating heat pump



- Combined heating and cooling applications
- Suitable for steam generation 1 to 10 bar_g
- Efficiency 45-55%
- Thermal output: 450-750 kW_{th}

Further material

Publications in scientific journals (open access) and scientific conferences.

Links on the HighLift-webpage:

https://highlift.olvondotech.no


Thank you for your attention!
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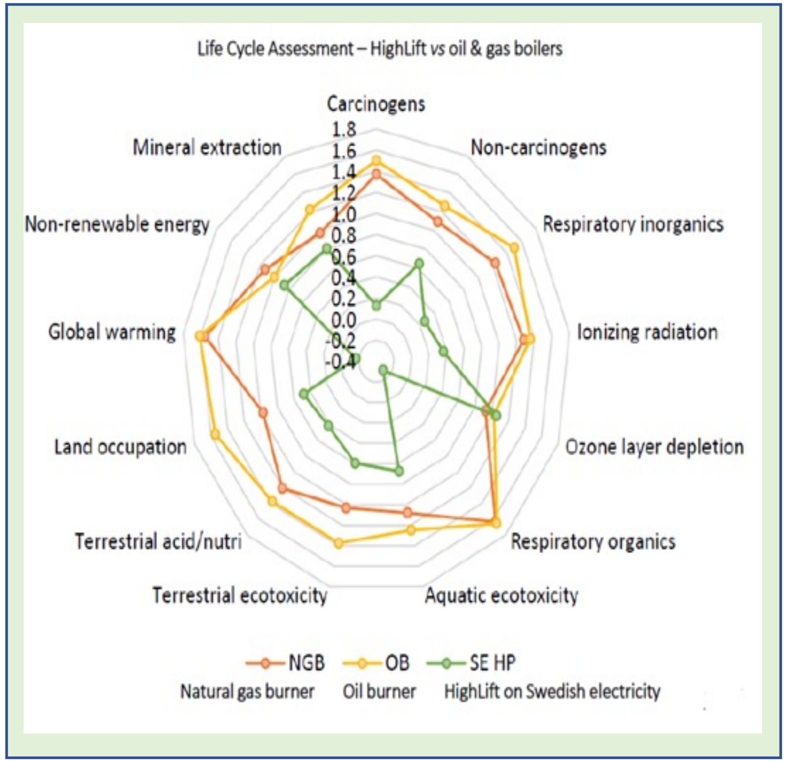
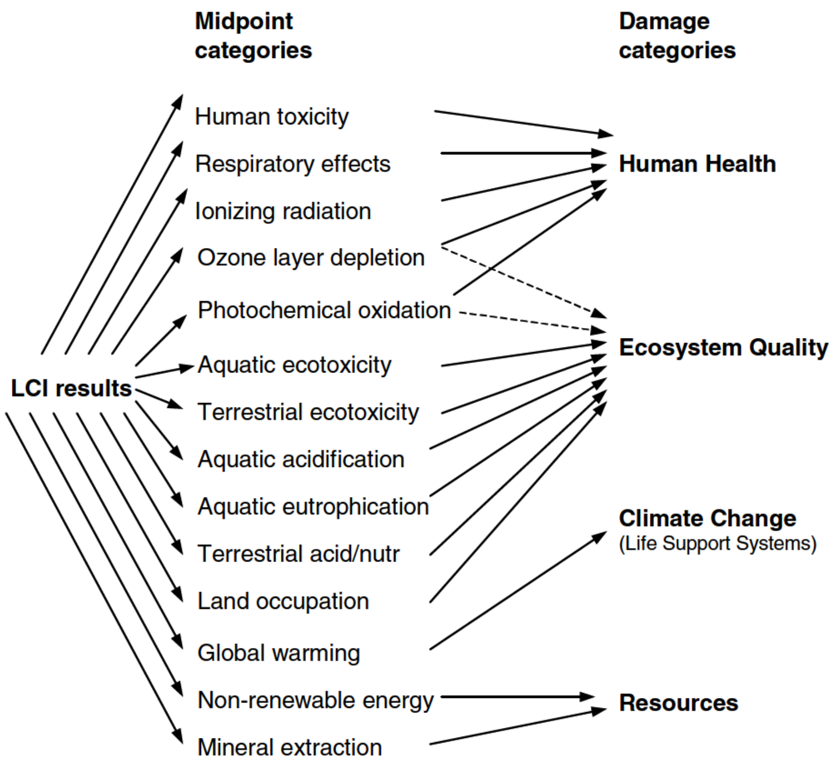
HighLift has a significant environmental impact



HighLift Life Cycle Assessment



IMACT 2002+ method

Spanish brewery example:

HighLift environmental impact reduction vs. natural gas boiler:

- 55%
- 1%
- 92%
- 95%

Total environmental impact reduction (kPt): 92%