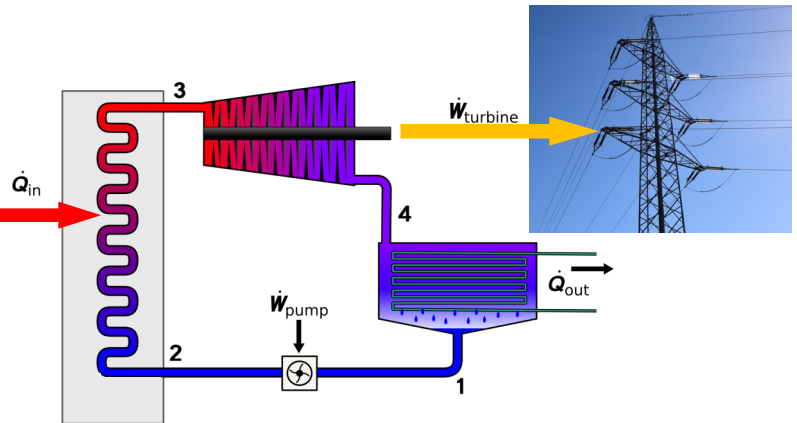


# Expander Test Laboratory



**Organic Rankine Cycle (ORC)**

Large amount of **surplus heat** from different industries in Norway currently is released to the ambient. These industries are usually located in isolated areas, so heat cannot be used directly. Thus, there is **potential of using this heat to generate electric power**, for example through **Organic Rankine Cycles (ORCs)**.

In ORCs, the **expander/turbine** transforms the energy in the fluid to shaft power, which is used to generate electricity. Our main objective of the **Flexible Expander Test Rig (EXPAND)** is to **develop efficient and reliable units for waste heat recovery with natural working fluids**. The aim is to provide experimental data of turbines/expanders in **10-100 kW range**, currently not available.

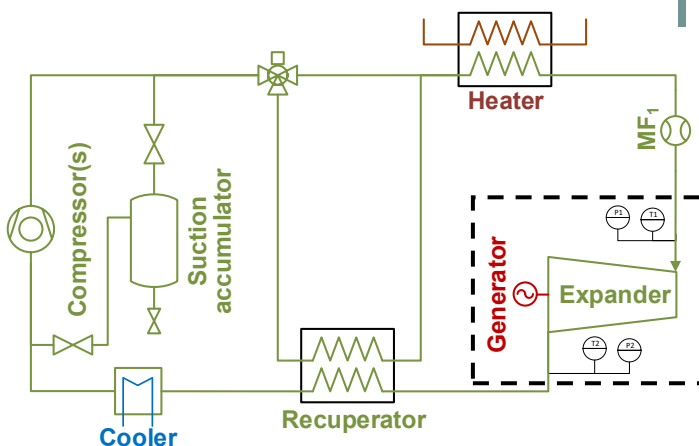
## Potential research and industry interest

### Research

- Validate numerical results
- Performance characterization
- Improve existing design methods
- Aerodynamic shape optimization of turbine blades
- Digital twin with machine learning

### Industry

- ORC and expander manufacturers
- End-users, e.g. metal industry



**Focus of our research**

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Simplified schematics of EXPAND (Flexible Expander Test Rig)