Context
Energy efficiency is essential:
- CO_{2}-abatement
- Cost efficiency

World energy-related CO_{2} emission savings by policy measure in the 450 scenario of the IEA.

Problem
The optimal integration of an electricity production cycle into a process. How to adapt the ORC to heat sources and sinks of a process?
Which are the relevant Constraints?

Many parameters:
- Working Fluids and Mixtures
- Single- or Multi-Stage, Extraction
- Optimal Size

Objective
Propose a methodology in order to identify a pareto-optimal ORC:
- quantitative criteria: efficiencies, cost, CO_{2}-equivalents, ODP, LCA
- qualitative criteria: toxicity, flammability

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Methodology

Constrains
The number of decision variables can be reduced by:
- Limiting CO_{2}-equivalents/ GWP
- Limiting ODP
- Excluding flammability
- Excluding toxicity

The decision variable range can be reduced by:
- Limiting maximum pressure
- Limiting number of ORC-stages
- Limiting maximum components in working fluid

Evaluation of Objectives
- Thermodynamics:
  - Energy-Efficiency
  - Exergy-Efficiency
- Cost (relative and NPV)
- Global Warming Potential
- Ozone Depletion Potential
- Life Cycle Analysis

Methodology using process integration for identifying suitable Organic Rankine Cycles for waste heat valorisation

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