Innodrive GmbH

Economy  **Ecology**

Improved Efficiency and Emission Reduction by Thermal Recuperation in Propulsion Systems

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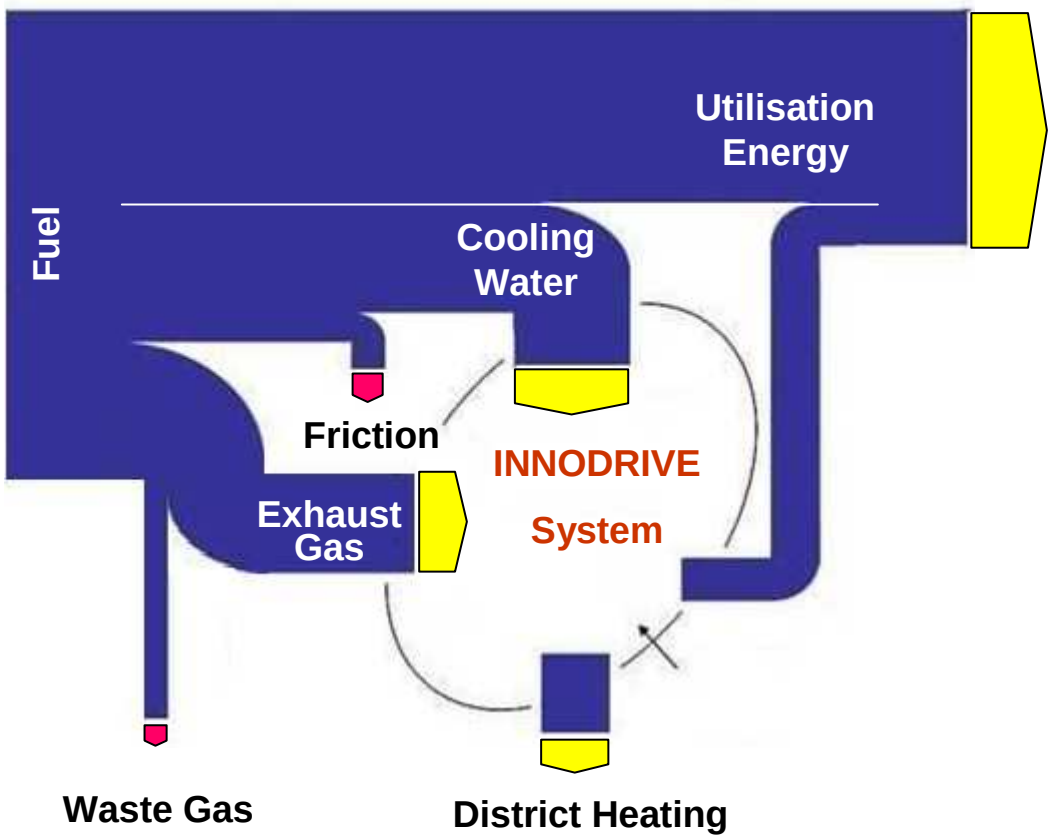
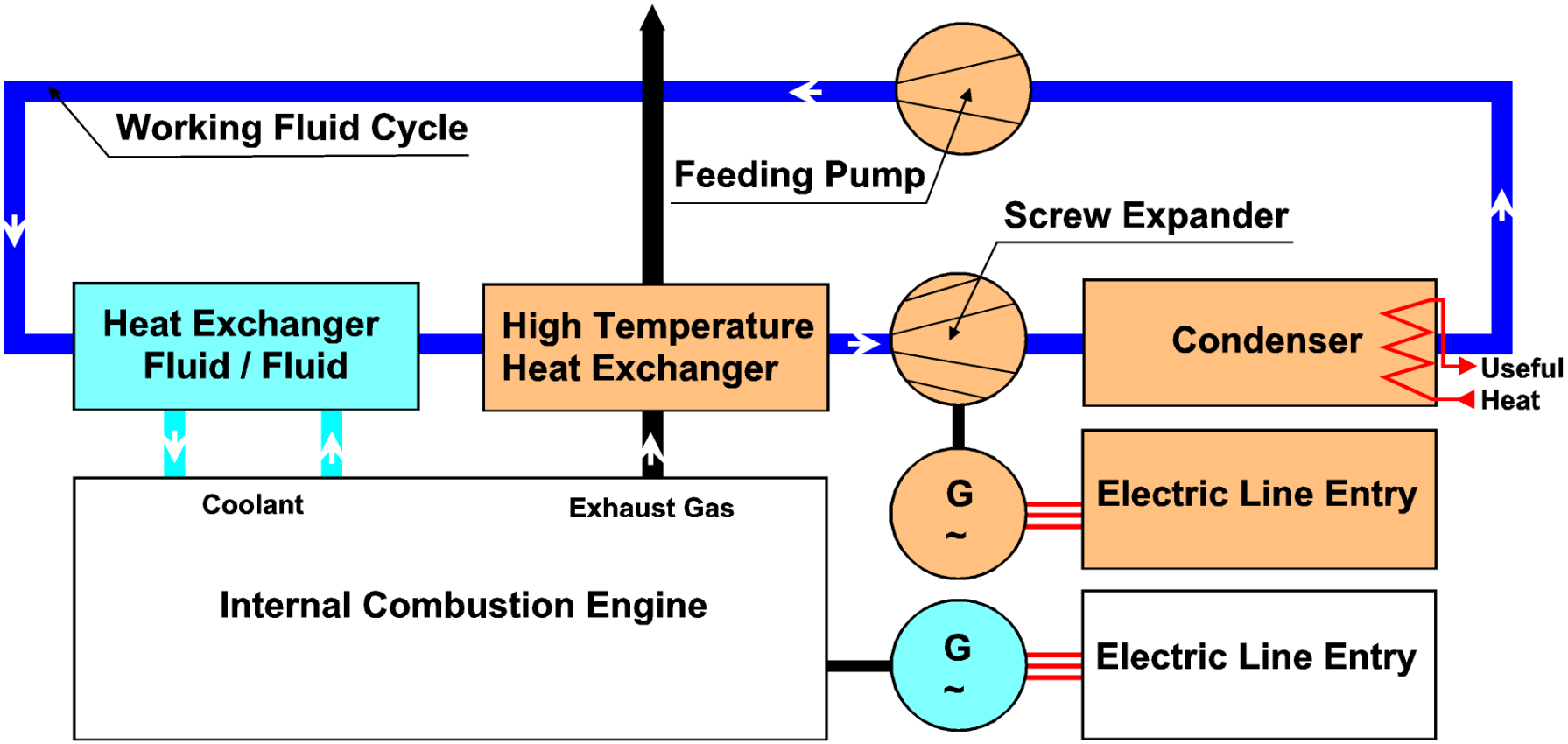
Motivation

Thermal Recuperation – Systematic Diagram



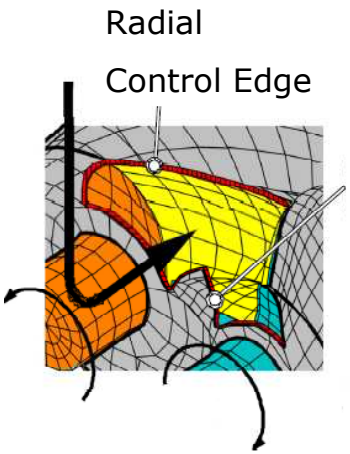
Stationary and Mobile Applications

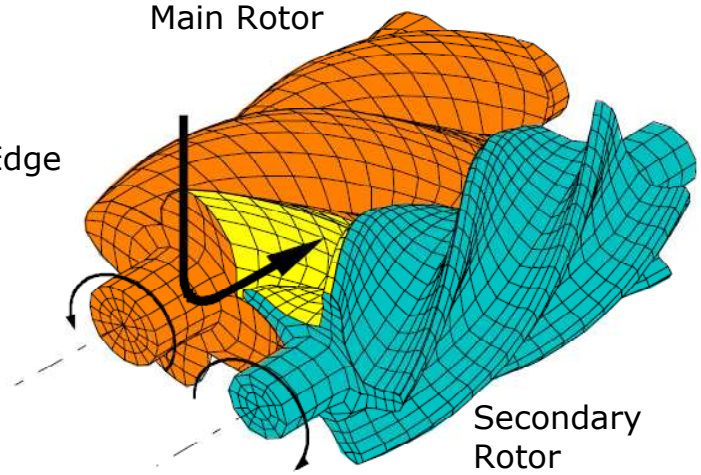


Step 2

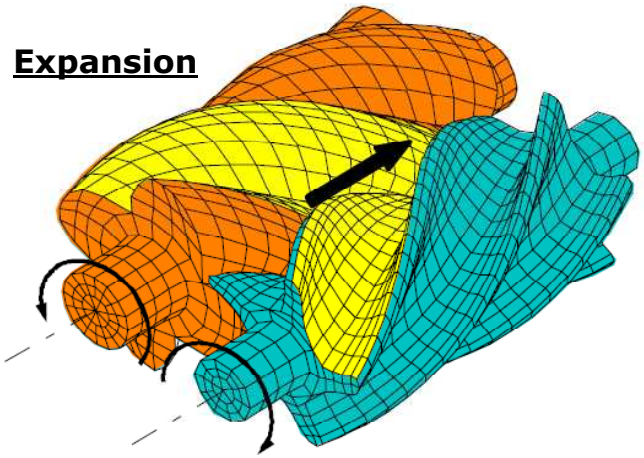
Cycle of the Screw Expander

Filling Process

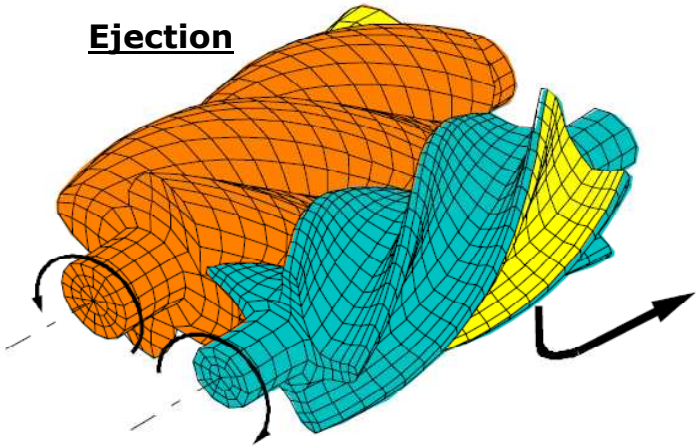




Expansion



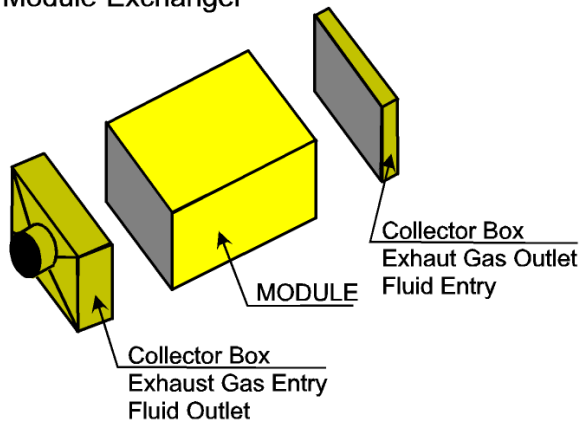
Ejection



 Quelle: UNI Dortmund; Dissertation B. P. Kliem

Possible Design Variations
Exhaust Gas Heat Exchanger

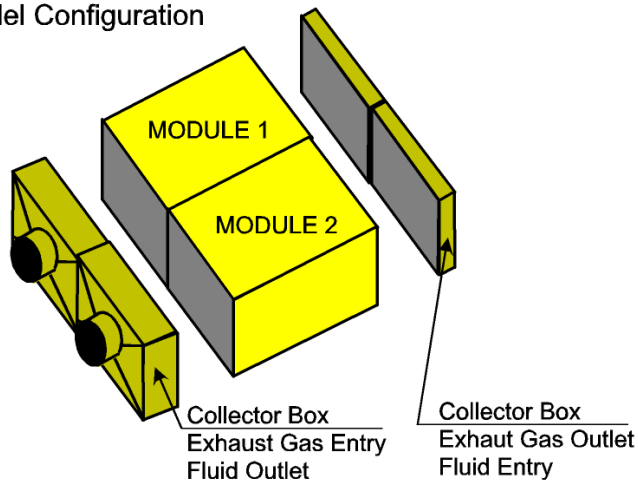
One-Module-Exchanger



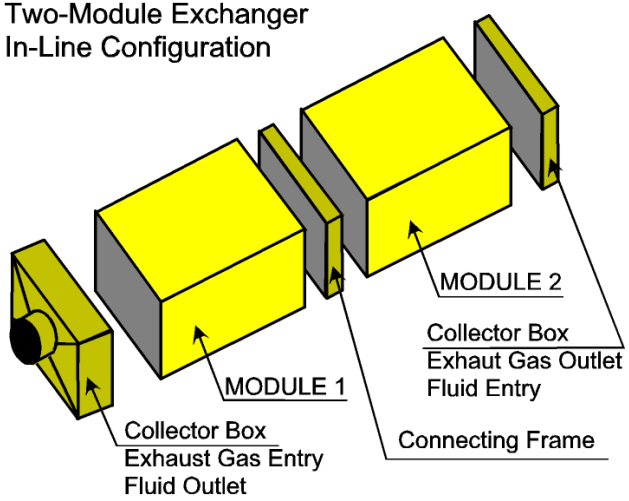
Technical Data of one Module

- **Transmission Power** **150 kW**
- **Mass Flow** **960 kg/h**
- **Exhaused Gas Temperatures** **520°C / 80°C**
- **Exhaused Gas Back Pressure** **25 mbar**
- **Size L x W x W** **0,4 x 0,3 x 0,22 m³**
- **Volume (without Collector Box)** **0,026 m³**

Two-Module Exchanger
Parallel Configuration



Two-Module Exchanger
In-Line Configuration



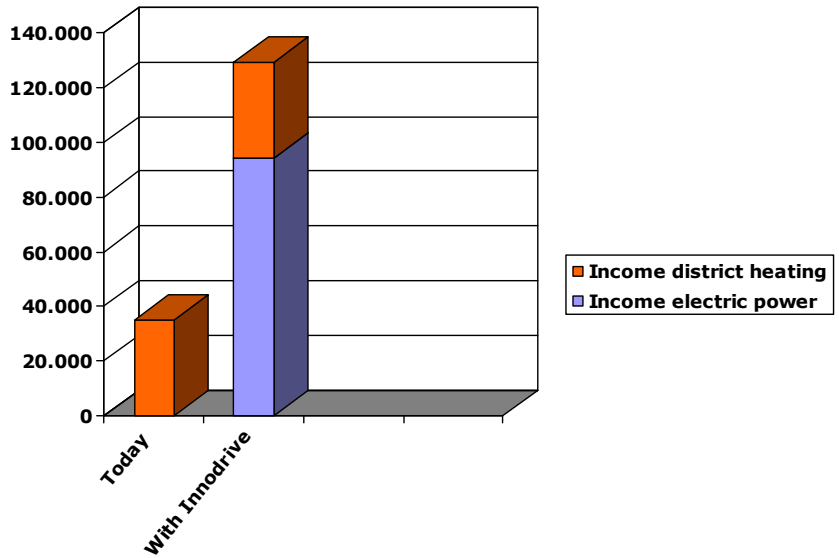
Economy of the Thermal Rekuperation

Example of a Thermal Power Plant

Today only District Heating

Peak:	ca. 450 kW
Ø Sales:	230kW
Operating Hours:	8.000
Payment:	0,019€/kWh

Income District Heating: 34.960€



With Innodrive System

Total Enthalpie:	387kW
Betriebsstunden:	8.000
Payment:	0,169€/kWh

Income District Heating: 34.960€

Income Electric Power: 94.180€

Total Income: 129.140€

Requirements

- R&D cooperation in mobile applications
- We need € 3 Mio. for 18 months