

## Distribution of PhDs and Post.Docs within RAs and WPs of HighEFF

### Strategic International Partnerships

- 2 PhDs for NTNU-MIT Collaboration
- 2 PhDs for NTNU-UoM Collaboration
- 2 PhDs for NTNU-KTH Collaboration
- 1 PhDs for NTNU-CMU Collaboration (CMU PhD funded 50% by CMU)

### RA1 – Methodologies 7 PhD

- WP 1.1 – Key Performance Indicators (KPI): Signe Kjelstrup (NTNU) (including fundamental research on the use of Exergy for Energy Efficiency): **1 PhD**
- WP 1.2 – Energy & Exergy Analyses: Truls Gundersen (NTNU) (Work and Heat Exchange Networks): **1 PhD**
- WP 1.3 – Process Systems Engineering: Sigurd Skogestad (NTNU) and Robin Smith (UoM) (Operational Optimization for Energy Savings): **2 PhDs**
- WP 1.3 – Process Systems Engineering: Truls Gundersen (NTNU) and Paul I. Barton (MIT) (Global Optimization for improved Energy Efficiency): **2 PhDs**
- WP 1.4 – Future Process Framework: Ivar Ståle Ertesvåg (Use of Exergy for Energy Efficiency in new Offshore Frameworks): 1 PhD **1 PhDs**

### RA2 – Components 3 PhD

- WP 2.1 – Heat Exchangers: Erling Næss with Armin Hafner as co-supervisor (NTNU) (Compact Heat Exchangers): **1 PhD**
- WP 2.2 – Expanders & Work Recovery Units: Armin Hafner (NTNU) (Expanders and Ejectors as Novel Components): **1 PhD**
- WP 2.4 – Natural Working Fluids and Mixtures: Trygve Eikevik (NTNU) (Energy Efficient and Environmentally friendly Working Fluids in Heat Pumps and Refrigeration Cycles): **1 PhD**

### RA3 – Cycles 6

- WP 3.1 – Heat-to-Power Conversion: Lars Olof Nord (NTNU) (Compact and Efficient Bottoming Cycles for Offshore Power Production): **1 PhD**
- WP 3.1 – Heat-to-Power Conversion: Supervisors: Petter Nekså (NTNU), and Per Lundquist (KTH) (Power Cycles Utilising Mixed Component Working Fluids): **2 PhDs**
- WP 3.3 – High Temperature Heat Pumping: Trygve Eikevik (NTNU) (Novel Components and Systems for High Temperature Heat Pumping): **1 PhD**
- WP 3.4 – Energy Storage: Armin Hafner with Erling Næss as co-supervisor (NTNU) (Energy Storage for Integration of Renewables, etc.): **1 PhD**
- WP 3.4 – Energy Storage: Sigurd Skogestad (NTNU) (Optimal Operation and Control of Energy Storage Systems): **1 PhD**

### RA4 – Applications 5 PhD - 1 PD

- WP 4.1 – Process Improvements: Supervisor: Gabriella Tranell (NTNU) (On the Way to Closed Furnaces in the Metallurgical Industry): **1 PhD**
- WP 4.2 – Surplus Heat Recovery: Supervisors: Petter Nekså (NTNU) (Novel Energy Recovery Concepts): **1 PhD**
- WP 4.3 – Technology Integration: Supervisors: Johannes Jäschke and Lorenz T. Biegler, (CMU) (Integration and Optimization of New Technologies in an existing Processing Plant): **2 PhD** (CMU PhD 50% funded by CMU)
- WP 4.4 – Industry Clusters/Grids: Supervisor: Leiv Kolbeinsen (NTNU) (Use of Smart Thermal Grids in Industrial Clusters for improved Energy Efficiency): **1 PhD, 1 Post.doc**

### 5.5 RA5 – Society

- WP 5.1 & 5.2 – Innovation & Roadmaps, Barriers & Enablers: Supervisor: Per M. Schieflo (NTNU Society Research) (A study of Barriers & Enablers for improved Energy Efficiency while considering Innovation and Roadmaps): **1 Post.doc**