UNIVERSITÄT PADERBORN

Industrial Energy-Related Technologies and Systems iets

REGENERATIVE ENERGIES FOR THE EFFICIENT OPERATION OF PRESS HARDENING LINES

LINZ, 14. OCTOBER 2022

Re²Pli

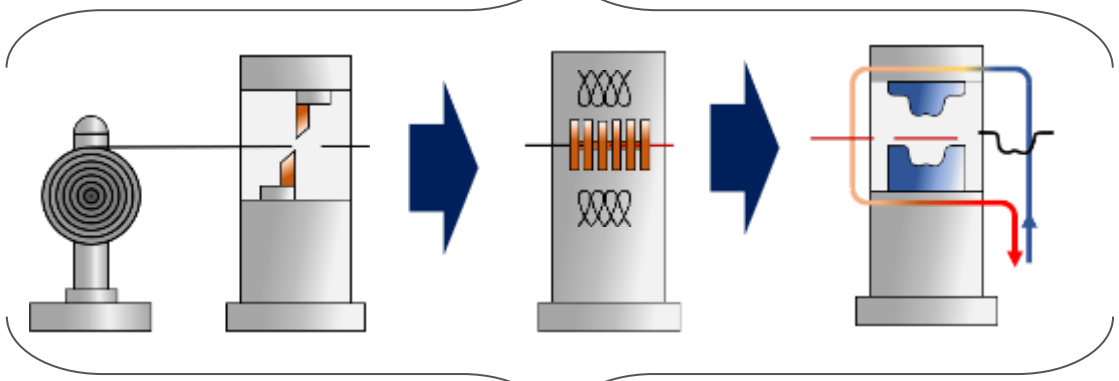
Energy management

Utilization of flexibility and target-oriented production planning

Smart control

Full demonstrator

Construction of a complete production line for press hardening which would be suitable for series production.

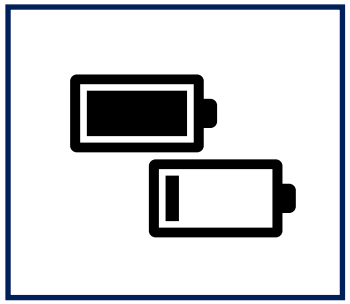


Induction Heating

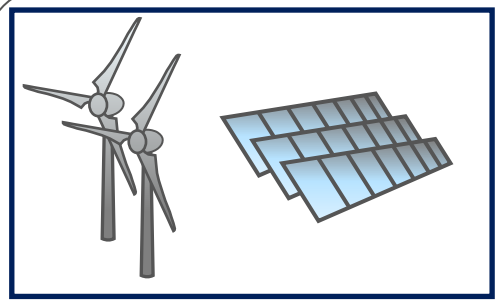
Use of electrical instead of fossil energy and increase in energy efficiency while achieving the same frequency and a homogeneously heated sheet

Energy storage

Reduction of power peaks and additional increase of flexibility



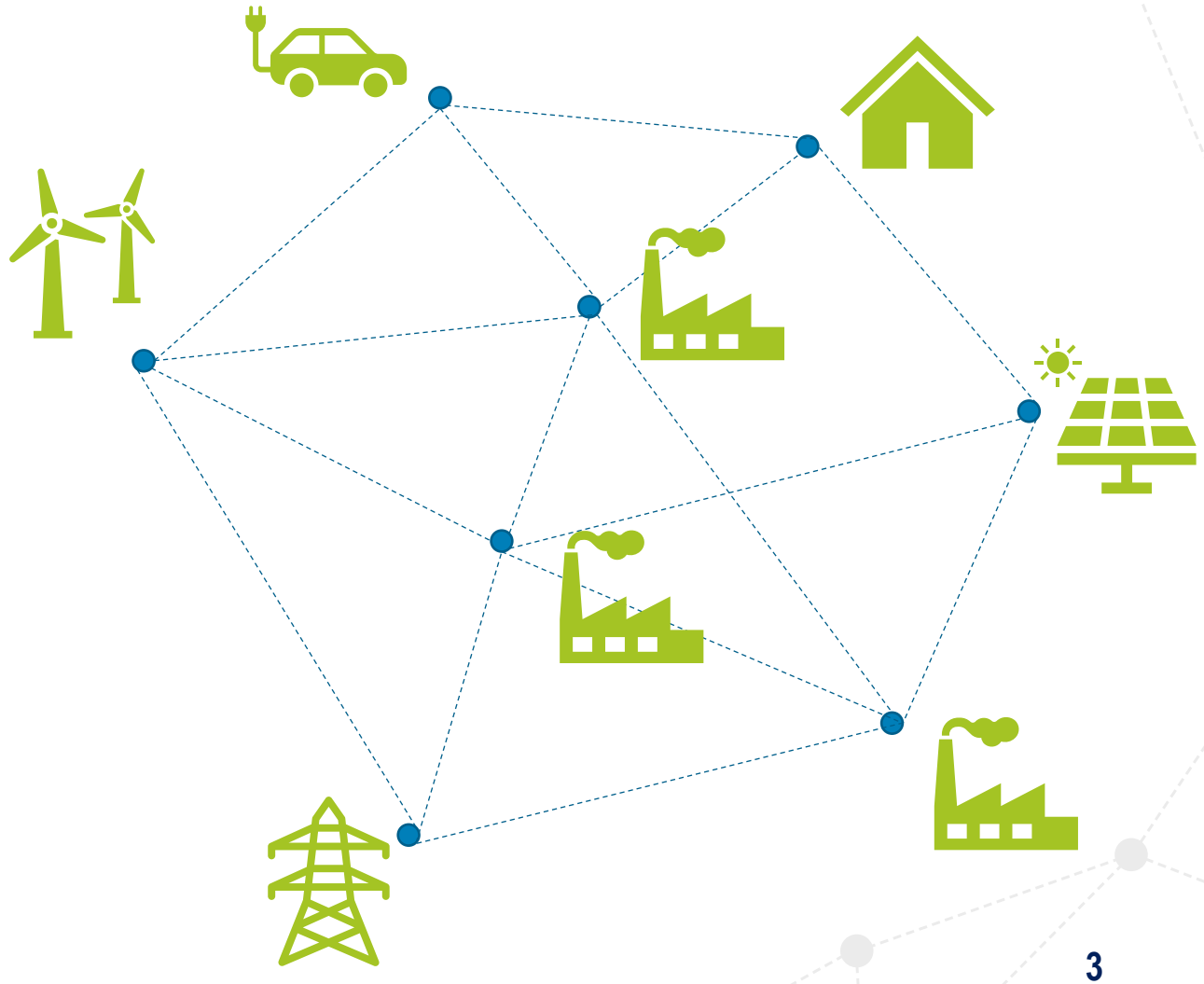
Renewable Energies



Enable and increase the use of renewable energies in industry through electrification

Integration into the regional energy system

- Creation of a digital twin
- Integration of the digital twin into the regional energy system
- Scenario analyses in connection with the Neue Mobilität Paderborn project (https://nemo-paderborn.de/)



Research objectives and degree of innovation

1. Construction of a production line for the press hardening of sheet metal components with inductive heating and manufacture of demonstrator components.

2. Implementation of the production line in the experimental space Neue Mobilität Paderborn.

3. Determination of business and operating models for a low-emission inductively operated press hardening line.

4. Life-cycle assessment of an inductively operated press hardening line.

Innovation and added value ——— **TRL < 5 → 8**

- efficient manufacturing based on renewable energies
- interdisciplinary approach to design:
  - Design of manufacturing processes
  - consideration of the integration into future energy systems
  - examination of innovative digital business models
- hybrid approach to operational planning
  - machine learning
  - operations research

Thank you for your attention!

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Kompetenzzentrum für Nachhaltige Energietechnik

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