

Efficiency of Industrial Processes

Energy efficient process heat and steam generation using renewables combined with vapour recompression and co-generation

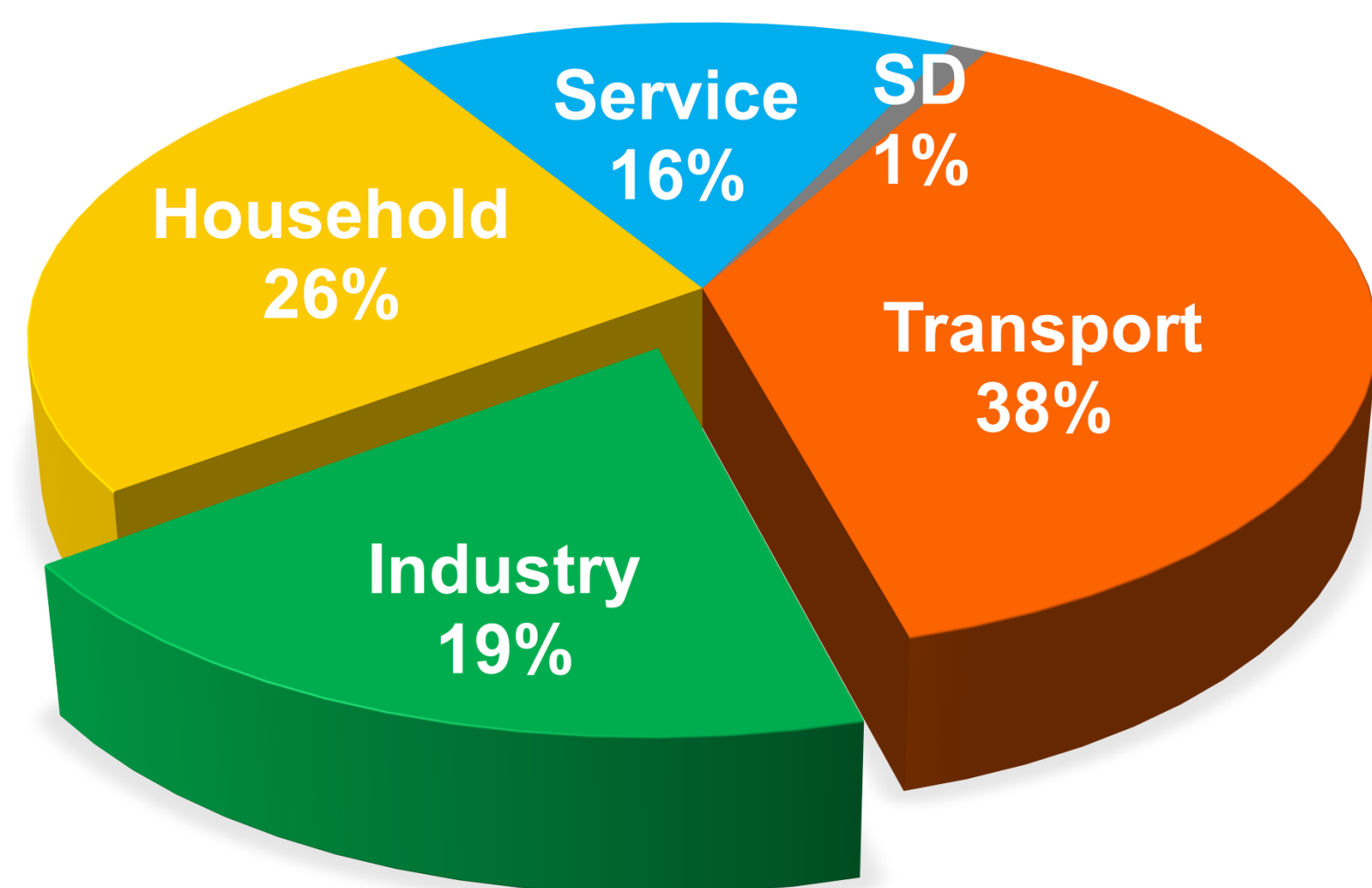
EIP & Work Package 2 Goals

The focus of the EIP & WP2 is on R&D. Goals are:

- Energy, exergy, and heat management in industrial processes.
- Development of efficient, reliable, and flexible solutions and technologies for industrial processes and production sites.
- Development of systems solutions that reveal the rational use of energy in the processes by favouring heat recovery, cost minimization, intensification, efficiency, flexibility, and reliability.

WP2 Task 2 Goals

- Providing system solutions for process heat and steam generation in industrial processes.
- Systems using renewable energies, such as solar thermal, PV, biomass, and geothermal energy, will be assessed along with co-generation and concepts using waste heat such as vapour recompression and high temperature heat pumps.



Energy consumption of Switzerland by sector in 2014. The industrial sector is using about 1/5 of the total consumption of the country. SD = Statistics difference. Source: SFOE.

- The applicability of system concepts including thermal storage will then be highlighted in several case studies and pilot projects.

Analysis

- Reviews** of heat generation systems such as gas turbines, heat pumps, fuel cells, solar collectors are made.
- Future improvements** and potential capacities of these processes are described in detail.

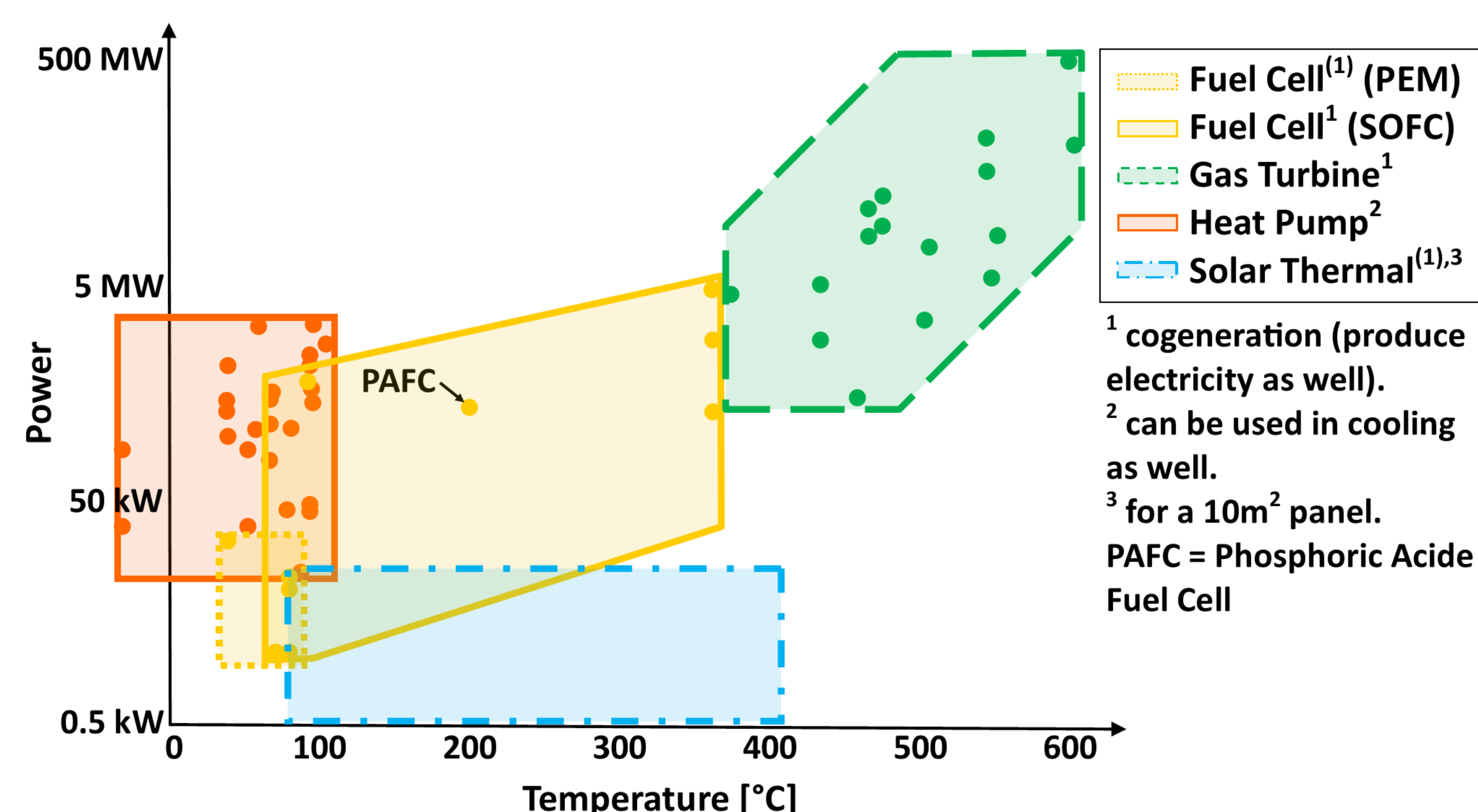
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Results

- Map illustrating the power and the temperature capacity of heat generation systems.



Power and temperature capacity of existing processes.

- Extensive list of heat generation systems structured by several criteria such as size, weight, noise, efficiency, etc.

Conclusions

Analysis and comparison of industrial heat generation systems in terms of several criteria have been made.

Future Work

- LCA and LCC analyses** of available processes will be performed.
- A tool will be developed to **assess benefits and drawbacks** of each technology.
- Case studies** will be conducted.

Project partners

In cooperation with the CTI

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Swiss Competence Centers for Energy Research

Schweizerische Eidgenossenschaft
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Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Commission for Technology and Innovation CTI

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