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Field demonstration of large scale stationary power
and CHP fuel cell system

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**Demonstration of a combined heat and power 2MWe PEM
fuel cell generator and integration
into an existing chlorine production plant**

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Publishable summary

The deliverable concerns the report on the design of the first series of PEM Power Plants. During the performance of the DEMCOPEM project, in operation at the company Ynnovate (Yingkou, province Liaoning, China), an extensive knowledge and experience was obtained in the design and operation of a 2 MWe PEM Power Plant. The plant showed the ability to function as a reliable completely automated, safe and remote controlled system.

The experience obtained in the DEMCOPEM project will be usefully implemented in the roll out phase of the PEM Power Plants. This experience mainly concerns design and operational items.

During the demonstration phase of the DEMCOPEM project a more than average decay of the cell voltage was observed. Most probably cause are contaminants in the reactants hydrogen and air that are specific for the local operating circumstances. Based upon experience in other fuel cell projects, this effect may not be expected in e.g. regular chlor-alkali or Power to Power (P2P) applications.

Since the roll out phase is planned soon after the DEMCOPEM project finishes, no fundamental design changes in the stack design are considered; the design is based on the current proven technology, with additional incremental developments. The current stack platform will be used, but with an increased cell count and operating point.

Improvements in the stack design and other improvements of the Balance of Plant lead to an improvement in CAPEX. Result is a concept design with implementation of the defined improvements.

The DEMCOPEM project was made possible by financial support of the EU. The roll out phase design is a step in the direction of economically viable systems. Local circumstances and financial starting points have an important influence on the economic viability of the system. In general, it nevertheless can be concluded that the technology only will be viable if CAPEX and OPEX cost are further improved in the future. An important factor in this development will be the increasing market of PEM fuel cells for transport applications, leading to e.g. decreasing cost of the complete supply chain and possibly longer life times of fuel cells. With this development as starting point an economic viable case is specified.

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