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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

This report constitutes the project Deliverable D3.4 “Final report on measurements obtained after 2 years of operation, analysis of component performances and recommendations for the integration of a PEM-unit into an existing chlorine production plant”. The report discusses the results of the analysis of the data measured from the acquisition system of the plant after the installation at Ynnovate.

Results of the analysis of data acquired between September and December 2016 were already presented in the project Deliverable D3.3. In this report, the analysis is extended to a wider set of data: all data acquired with measurements during the first two years of operation, from the 8th of September 2016 to the 28th of April 2018, are here analysed. The analysis aims at assessing the plant performances under real operating conditions, to identify issues and possible improvements and in order to give recommendations for the integration of a PEM generator in an existing chlorine plant.

A first section of the deliverable (see Chapter 3) is dedicated to the assessment of system measured performances and their evolution during the observed period; a specific analysis is dedicated to a prolonged period of full load operation reached at the beginning of 2017. A second section (Chapter 4) aims at evaluating the cells degradation mechanism and estimating the decay rate, that depends on the operational history of the stack and onsite specific parameters; correlations between the cells decay rate and operating parameters are also investigated. Then, Chapter 5 analyses the plant performances at stack level, investigating possible correlations between the fuel cells behaviour and the plant operating parameters. Finally, suggestions for further development of the PEM technology when coupled with chlor-alkali plants are provided in chapter 6.

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