Market perspectives of stationary fuel cells in a sustainable energy supply system – long term scenarios for Germany

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Abstract

Because of the high efficiency, low environmental impacts, and its potential role in transforming our energy system into a hydrogen economy, fuel cells are often considered as a key technology for a sustainable energy supply. However, the future framing conditions under which stationary fuel cells have to prove their technical and economic competitiveness are most likely characterised by a reduced demand for space heating, and a growing contribution of renewable energy sources to heat and electricity supply, which both directly limits the potential for combined heat and power generation, and thus also for fuel cells. Taking Germany as a case study, the paper explores the market potential of stationary fuel cells under the structural changes of the energy demand and supply system required to achieve a sustainable energy supply. Results indicate that among the scenarios analysed it is in particular a strategy oriented towards ambitious CO_2 reduction targets which due to its changes in the supply structure is in a position to mobilise a market potential which

might be large enough for a successful fuel cell commercialisation, while under the conditions of a business-as-usual trajectory the sales targets of fuel cell manufacturers cannot be met.