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# High-Temperature Fuel Cells in Decentralized Power Generation

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## Abstract

Decentralised power generation (DG) can contribute to increases in efficiency of the entire power generation and distribution network. It reduces grid losses by moving the generation closer to the customer, thus also allowing the use of the waste heat generated in electricity production. At the same time it offers competitive advantages to industrial customers in supplying cost effective peak production, grid stabilisation and uninterruptible power supply. Total power generation efficiency, and subsequently also CO<sub>2</sub> balances, though, is only increased if the DG electrical efficiency meets minimum standards. These are defined by the grid characteristics within which the DG is operated. High temperature fuel cells offer a high value due to their high electrical conversion efficiencies of above 50%, reaching up to over 60% with the Solid Oxide Fuel Cell (SOFC). High efficiency, though, is only achieved with adequate system architectures. Worldwide, a number of manufacturers and developing groups are working on fuel cells for distributed electricity generation, with increasing success.

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