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## Futuristic reversible power plants based on solid oxide fuel cells

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Today's power plants produce electric power using the chemical energy contained in fuels. Many of these power plants are used to meet the base load power requirements. In the future, if and when intermittent renewable energy sources are widely used for power production, fuel fed power plants might have to be used to produce power only when electricity from renewable systems is not available. Plant capacity utilization will be minimal and this might increase the cost of electricity produced. Solid Oxide Fuel Cells (SOFCs) are considered for efficient power production using a wide array of fuels. It has also been reported by many that SOFCs can be reversed to produce fuels. When H<sub>2</sub>O and CO<sub>2</sub> mixtures are electrolyzed, syngas is produced and with appropriate downstream process steps, different fuels can be produced. This way, reversible SOFCs can be used for both grid balancing and for energy storage. The plant can be used for longer durations making them economically attractive. This paper will present recent trends in the development of reversible SOFC systems and their emerging applications. Additionally, a brief comparison with competing options for grid balancing and energy storage will be presented.

### Biography

P V Aravind is an Associate Professor at Delft University of Technology. He teaches courses on Thermodynamics of Energy Conversion and Fuel Cell Systems at Delft. He also teaches at TU Munich in Germany and contributes to a course at KU Leuven in Belgium. He is involved in several national, European and international energy related research projects focusing on fuel cell systems. Currently, he supervises a team of nine PhD students, two Postdoctoral Researchers and several MSc students. Many of his team members are involved in SOFC system development with a special focus on Gasifier-SOFC systems.

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