



Switzerland

The core of the SWITCH system is a unit that produces electric power or hydrogen, depending on the operating mode.

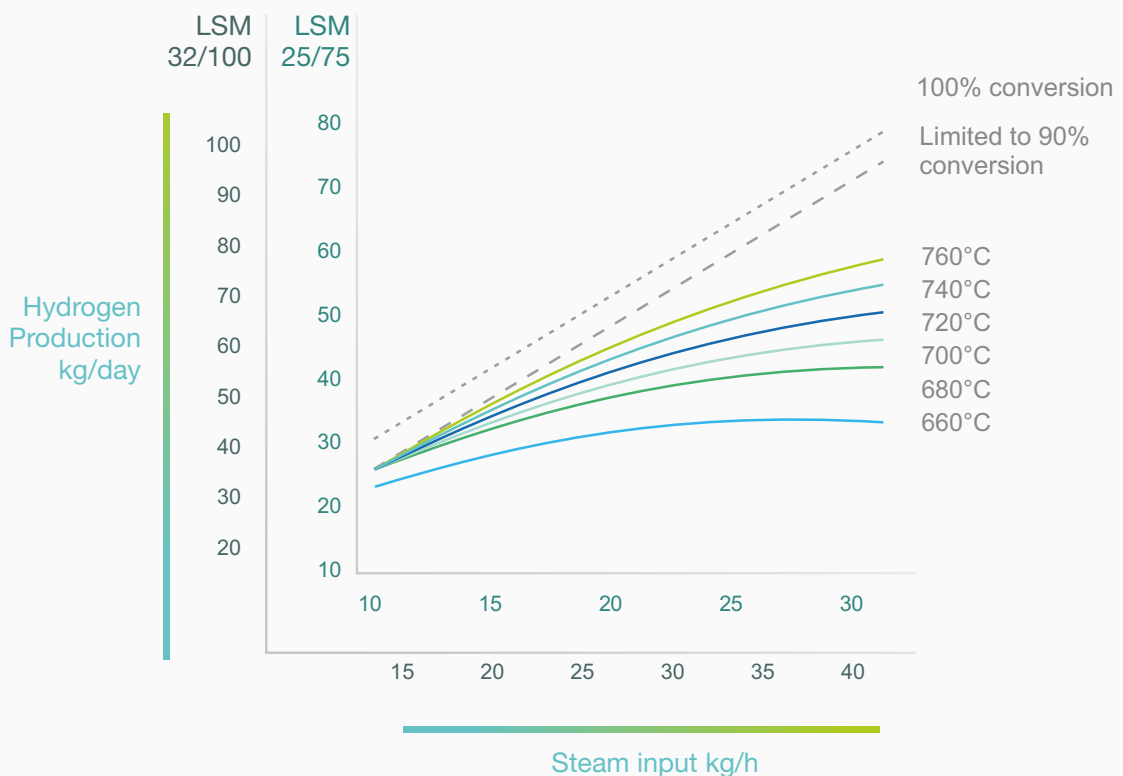


The core of the SWITCH system is a unit that produces electric power or hydrogen, depending on the operating mode. It contains stacks with ceramic cells operating between 650°C and 800°C. This unit converts fuels and gases into electricity, heat and hydrogen in different proportions when operating in fuel cell mode; and converts steam to hydrogen by using electricity when operating as an electrolyser.

Due to the SOFC technology, fuel pre-processing is less complicated and the steam electrolysis process inside the stacks takes place at a higher efficiency than competing technologies that work at a lower temperature. Hence, the system requires less electrical energy for steam electrolysis to produce hydrogen. It further allows for using cheap, widely available materials, which secures deployment at a large scale, now and in the future.

The unique and reliable design of the Large Stack Module (LSM) and its innards, which was developed by SolydEra, offers advantages over many competing technologies, and allows for flexible scaling to meet the customer's needs. It further offers the unique opportunity to combine the two operating functions in one unit, by which investment costs and footprint are kept low.

## LSM - SOE Hydrogen Production Performance



## Key point

- **Fully reversible system** with Solid Oxide Cells technology (SOFC/SOE)
- Power production in fuel cell mode: 25 kW or 32 kW
- Power consumption in electrolysis mode: 75 kW or 100 kW, according to the H<sub>2</sub> yield
- **Switching between both operating modes in less than an hour**
- Precise gas distribution between the stacks inside the SOFC/SOE unit
- Electrical efficiency in fuel cell mode up to 62% DC (Gas-to-Power, CH<sub>4</sub> eq., LHV)
- Conversion efficiency in steam electrolysis mode up to 97% DC (Power-to-Gas, LHV)
- Steam conversion up to 90%
- **Easily adjustable, modular design**



In the SWITCH system, the SOFC/SOE unit works with a Hot Balance-of-Plant module including an air heating unit, based on special designed heat exchangers combined with electrical preheater to enhance the heat recovery and the thermal management. A fuel processor upstream and downstream of SOFC/SOE unit allows to obtain hydrogen rich gas in both fuel cell and electrolysis modes to be further purified by means of pressure swing adsorption.

