

SOEC high-temperature electrolysis

The future of green hydrogen production

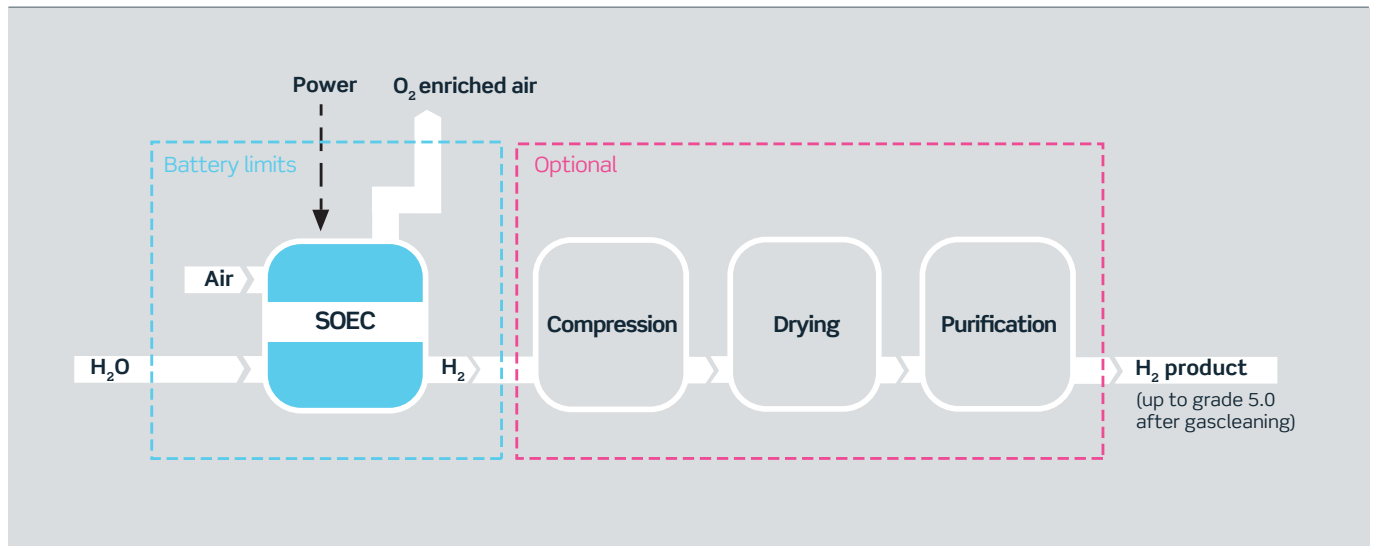
Superior performance across the world's most challenging industries

High-temperature electrolysis, made possible by Haldor Topsoe's solid-oxide electrolysis cell (SOEC), is a tested and proven process that enables industrial-scale production of hydrogen using renewable electricity.

Industry-leading efficiency, high reliability, and full integrability with downstream processes are hallmarks of Topsoe's SOEC solution. When coupled with heat-producing technologies, it allows for the lowest

levelized hydrogen cost through the highest level of energy efficiency at megawatt or gigawatt volume – no matter the industry.

Model 1: SOEC process



Applications



CHEMICALS

Produce green ammonia, methanol, and other compounds with renewable sources with less electricity, lower the carbon intensity of your existing fleet with green revamps – or both. As a single-source supplier for the entire process, from electricity intake to product output, Topsoe helps de-risk your operation across the equipment lifetime.



FUELS

Ensure a steady supply of green hydrogen for your refinery applications, reducing your GHG emissions during hydroprocessing. SOEC helps you meet more ambitious reduction targets with a cost-competitive, ultra-efficient H₂ source, whether you're producing low-sulfur diesel, electrofuels, or anything between.



POWER & UTILITY

Convert and store renewable energy within a carbon-free vector, supporting bulk hydrogen availability that serves your industrial customers' sustainability initiatives. SOEC can improve your energy-generation margin by extending the value chain up to the molecule itself, providing a stable, strong revenue source for the future.



STEEL

With an energy-consumption reduction of up to 30% made possible by integration with existing heat sources, SOEC can reduce the carbon intensity of your production with a green revamp. Grassrooting a steel operation with an integrated green-H₂ source is also possible, allowing for cost-competitive, future-proof development.

Get in touch today

Visit topsoe.com/contact for project-specific consumption figures and quotes

Technical data H₂ SOEC 100 MW SOEC 32,000 Nm³/h

Core capacity

H ₂ production capacity	32,000 Nm ³ /h
Turn down ratio, at plant level	10-100%

Product conditions

Pressure @ BL	2 bar g
Pressure H ₂ product	Per customer requirement
Temperature H ₂ @ BL	Ambient
H ₂ purity	Up to 99.999% (dry basis after gas cleaning)

Feed conditions

H ₂ O as DMW	27,000 kg/h
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Power input

Total stack power consumption	100 MW
Specific power consumption, stack level	3.1 kWh/Nm ³ H ₂
Specific power consumption, plant level	Depending on heat integration and H ₂ pressure
Steam supply (if available)	Flow rate depending on pressure level

Other specs

Approximate footprint including BoP	8,400 m ²
Electricity supply at plant BL	24 kV (6-24 kV possible)

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Haldor Topsoe is a global leader in supply of catalysts, technology, and services to the chemical and refining industries. Topsoe aims to be the global leader within carbon emission reduction technologies by 2024. By perfecting chemistry for a better world, we enable our customers to succeed in the transition towards renewable energy. Topsoe is headquartered in Denmark and serves customers around the globe. In 2020, our revenue was approximately DKK 6.2 billion, and we employ around 2,100 employees.

Get in touch today
topsoe.com/green-hydrogen

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