

September 2022



next generation

green hydrogen solutions for industry and transport

 **stargate
hydrogen**



stargatehydrogen.com

decarbonising industry and transport

Stargate is a fast growing hydrogen equipment manufacturer.

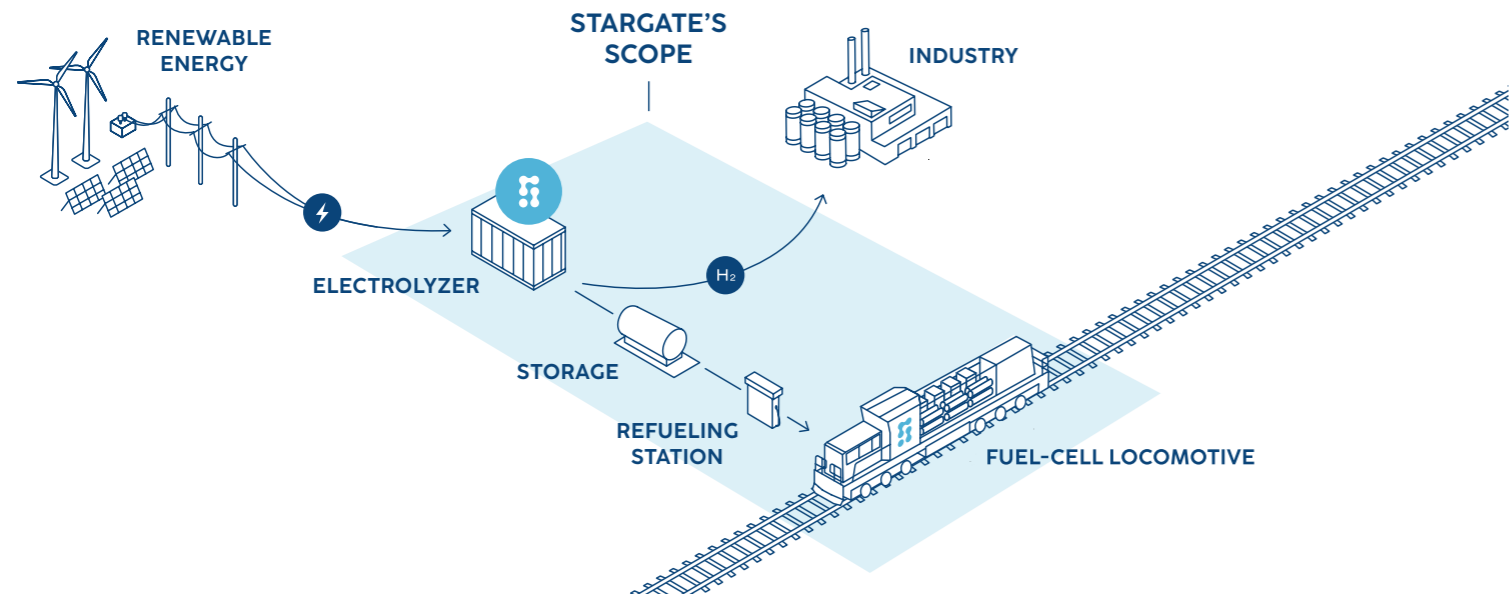
We are part of the Utilitas Group which is one of the largest renewable energy developers in the Baltic Sea region.

Stargate offers turn-key solutions in electrolysis production and locomotive retrofitting segments. We design, implement, and maintain systems from hydrogen production and compression to storage and dispensing.

Our Investors



Our investors include the co-founder of Skeleton Technologies which is the world's leading ultracapacitor manufacturer.



hydrogen production by electrolysis

Hydrogen produced by electrolysis is the missing link in the green energy transition. It offers a way to decarbonize sectors such as heavy transport, steelmaking, and chemical industry, where it is proving difficult to reduce emissions through electrification alone.

zero-emission locomotives

Rail freight contributes 4% to climate change in the transport sector. Hydrogen is a zero-emission alternative to diesel. As tens of thousands of locomotives will reach their end of life, retrofitting these onto hydrogen achieves the lowest possible lifecycle carbon emissions.

feasibility study

When considering and planning a potential project, you need to base your decisions on accurate information. Our feasibility study services will help you determine the viability of your hydrogen project and collate the details you need to secure funding.

alkaline electrolyzers for lowest levelised cost of hydrogen

Lowest CAPEX

Highest efficiency

Flexible load following

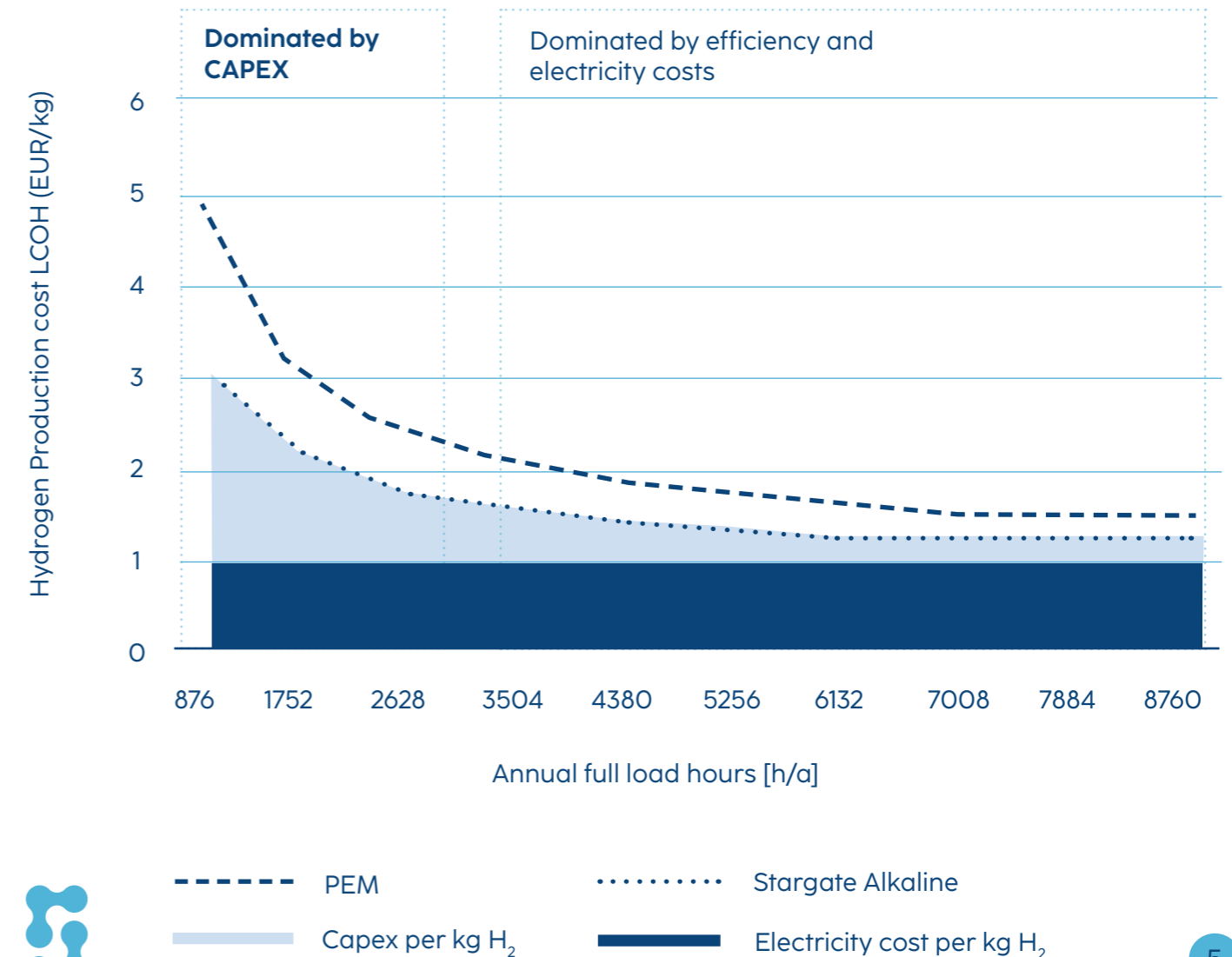
Robust technology

Pressurized H₂ output

Non noble materials

No dependence on critical raw materials

Stargate's alkaline electrolyzers offer best value both in flexible and constant operation thanks to high efficiency at a competitive price



generation I

SMART, FLEXIBLE, AFFORDABLE

Flexibly following the production of solar and wind energy

Turn-key solutions focused on customer needs

Possibility to deliver Refueling station and compressor together with eletcrolyser stack

gateway SERIES

- Containerized units for small-to-medium scale systems
- Tailored for hydrogen refueling station applications
- High-purity product ($\leq 99.999\% \text{ H}_2$)

Product	Production capacity	Installed electrical power	Operating range	Delivery pressure	System efficiency	H ₂ purity	Electrical input	Ambient temperature range	Certification
	Nm ³ /h (kg/h)	kVA	%	barg	kWh/kg	%		°C	
Gateway 02	200 (18)	1100	20-100	30	53-55 ¹	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark ²
Gateway 04	400 (36)	2200	10-100	30	53-55 ¹	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark ²
Gateway 08	800 (72)	4400	5-100	30	53-55 ¹	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark ²
Gateway 16	1600 (144)	8800	5-100	30	53-55 ¹	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark ²
Gateway 20	2000 (180)	11000	5-100	30	53-55 ¹	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark ²

starbase SERIES

- Skid-mounted units for large-scale systems
- Tailored for industrial applications: steel, refineries, green chemicals, etc.
- High-purity product ($\leq 99.999\% \text{ H}_2$)

Product	Production capacity	Installed electrical power	Operating range	Delivery pressure	System efficiency	H ₂ purity	Electrical input	Ambient temperature range	Certification
	Nm ³ /h (kg/h)	MVA	%	barg	kWh/kg	%		°C	
Starbase 20	2000 (180)	11	10-100	30	53-55 ¹	> 99.999	0.4 - 35 kV	5 to +40	CE-mark ²
Starbase 40	4000 (360)	22	10-100	30	53-55 ¹	> 99.999	0.4 - 35 kV	5 to +40	CE-mark ²
Starbase 100	10000 (900)	55	10-100	30	53-55 ¹	> 99.999	0.4 - 35 kV	5 to +40	CE-mark ²
Starbase 200	20000 (1800)	110	10-100	30	53-55 ¹	> 99.999	0.4 - 35 kV	5 to +40	CE-mark ²

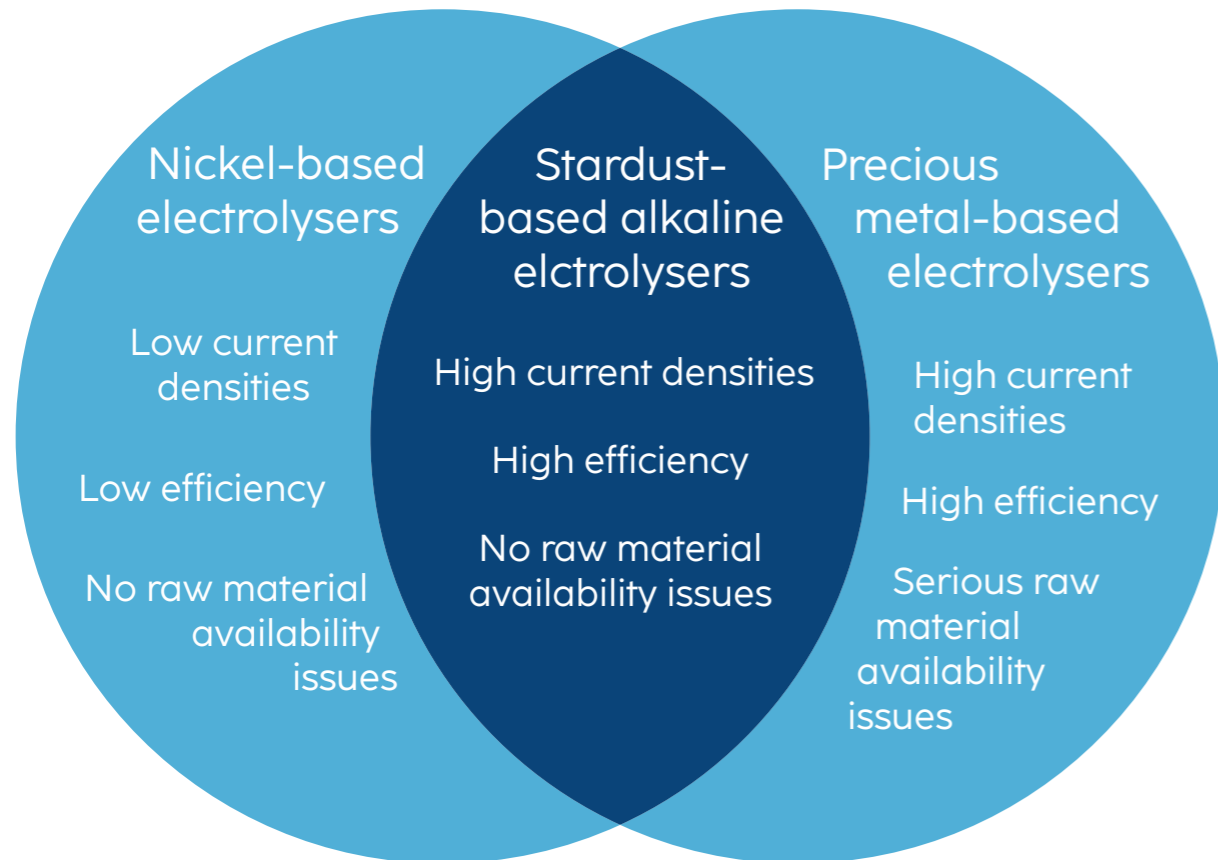
¹ Depending on system load point

² Includes PED, LVD, ATEX, EMC, MD directives and standards

generation II — stardust

PEAK PERFORMANCE WITHOUT CRITICAL
RAW MATERIALS

Stargate is improving our generation I product with future electrode technology to meet the requirements of a demanding and fast changing market.



alkaline electrolyzers with highest efficiency thanks to proprietary Stardust materials



Stargate has a patent pending
in ceramic catalysts

full value chain demonstration of green hydrogen production

Press release, 22nd December 2021

“Estonian Environmental Investment Center awards 5 million EUR for establishing a greenhydrogen full value chain”

SOURCE OF ENERGY

CHP and PV

HYDROGEN SOURCE

1MW alkaline electrolyzer
Waste heat re-use in district heating

USE OF HYDROGEN

Public transport

STARGATE'S ROLE

Technical project management and system integration



modernization of diesel locomotive with zero-emission power train

Press release, 7th October 2021

“Stargate to deliver hydrogen locomotives to international rail company Operail”

STARGATE'S ROLE

Technology design, engineering and supervision of the physical retrofitting work



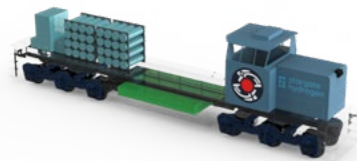
ORIGINAL GE C36-7



HOODS, DIESEL GENSET AND FUEL TANK REMOVED



FRAME AND BOGIES MODERNIZED



FUEL CELLS, BATTERIES AND HYDROGEN TANKS INSTALLED



STARGATE C30-H





Meanwhile, a factory for giga-scale production is being developed to provide delivery of new solution for upcoming demand in 2025

stargate gigafactory

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