

June 2022



# next generation

green hydrogen solutions for industry and transport



[stargatehydrogen.com](https://stargatehydrogen.com)

# decarbonising industry and transport

Stargate is a fast growing hydrogen equipment manufacturer.

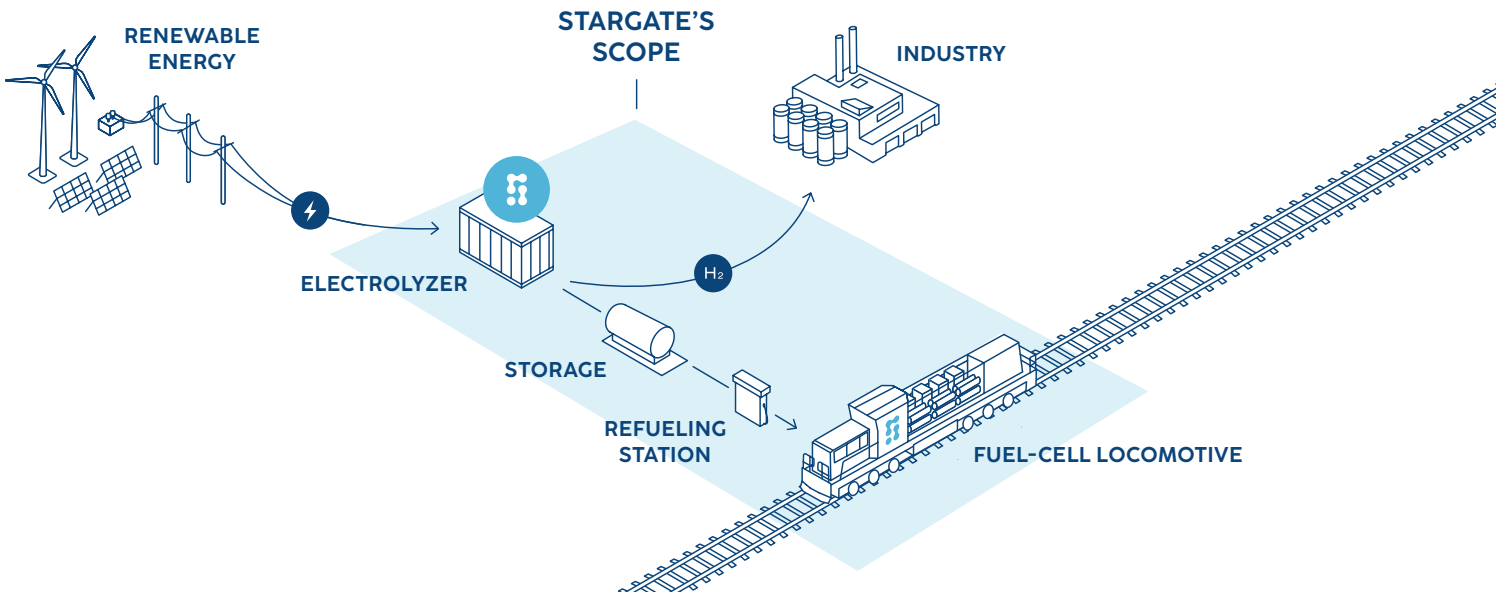
We are part of the Utilitas Group which is one of the largest renewable energy developers in the Baltic Sea region.

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

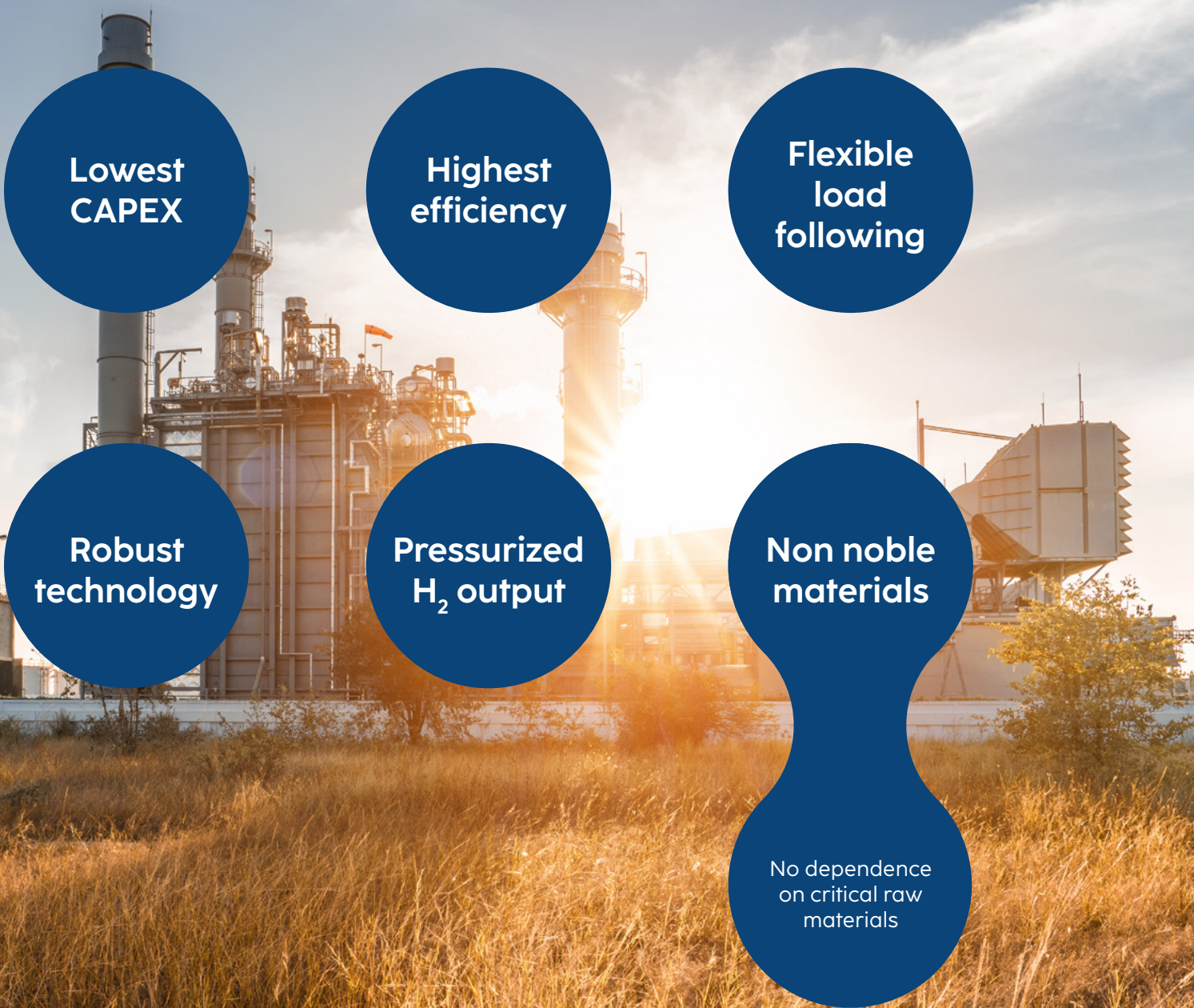
Rail freight contributes 4% to climate change in the transport sector. Hydrogen is a zero-emission alternative to diesel. As tens of thousands of locomotives will reach their end of life, retrofitting these onto hydrogen achieves the lowest possible lifecycle carbon emissions.

## feasibility study

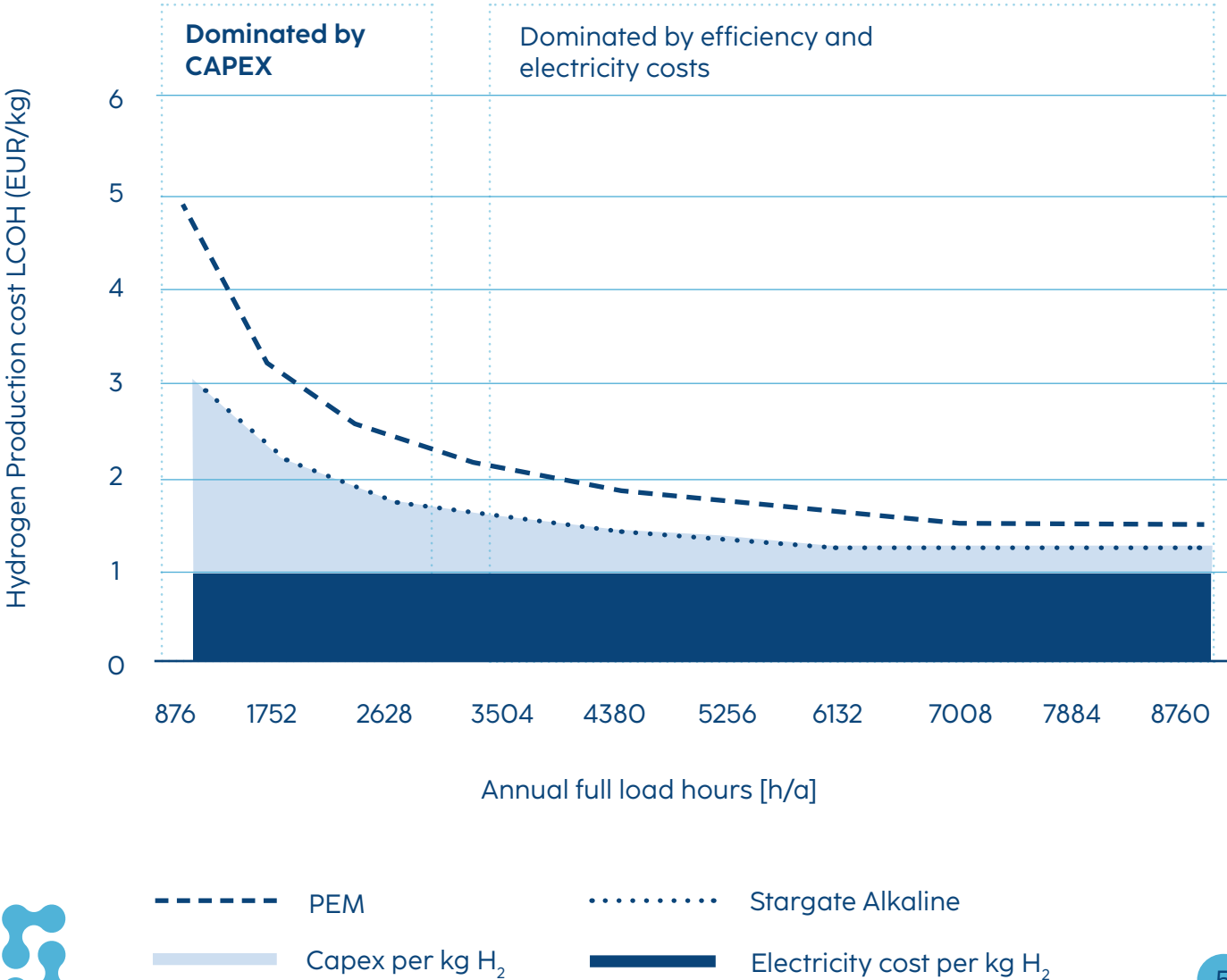
When considering and planning a potential project, you need to base your decisions on accurate information. Our feasibility study services will help you determine the viability of your hydrogen project and collate the details you need to secure funding.



# alkaline electrolyzers for lowest levelised cost of hydrogen



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 S E R I E S

- Containerized units for small-to-medium scale systems
- Tailored for hydrogen refueling station applications
- High-purity product ( $\leq 99.999\%$  H<sub>2</sub>)

Product	Production capacity	Installed electrical power	Operating range	Delivery pressure	System efficiency	H <sub>2</sub> purity	Electrical input	Ambient temperature range	Certification
	Nm <sup>3</sup> /h (kg/h)	MVA	%	barg	kWh/kg	%		°C	
Gateway 01	200 (18)	1	10-100	30	52-55 <sup>1</sup>	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark <sup>2</sup>
Gateway 02	400 (36)	2	10-100	30	52-55 <sup>1</sup>	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark <sup>2</sup>
Gateway 04	800 (72)	4	5-100	30	52-55 <sup>1</sup>	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark <sup>2</sup>
Gateway 08	1600 (144)	8	5-100	30	52-55 <sup>1</sup>	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark <sup>2</sup>
Gateway 10	2000 (180)	10	5-100	30	52-55 <sup>1</sup>	> 99.999	0.4 kV, 3-ph 50/60 Hz	-20 to +40	CE-mark <sup>2</sup>

## starbase S E R I E S

- Skid-mounted units for large-scale systems
- Tailored for industrial applications: steel, refineries, green chemicals, etc.
- High-purity product ( $\leq 99.999\%$  H<sub>2</sub>)

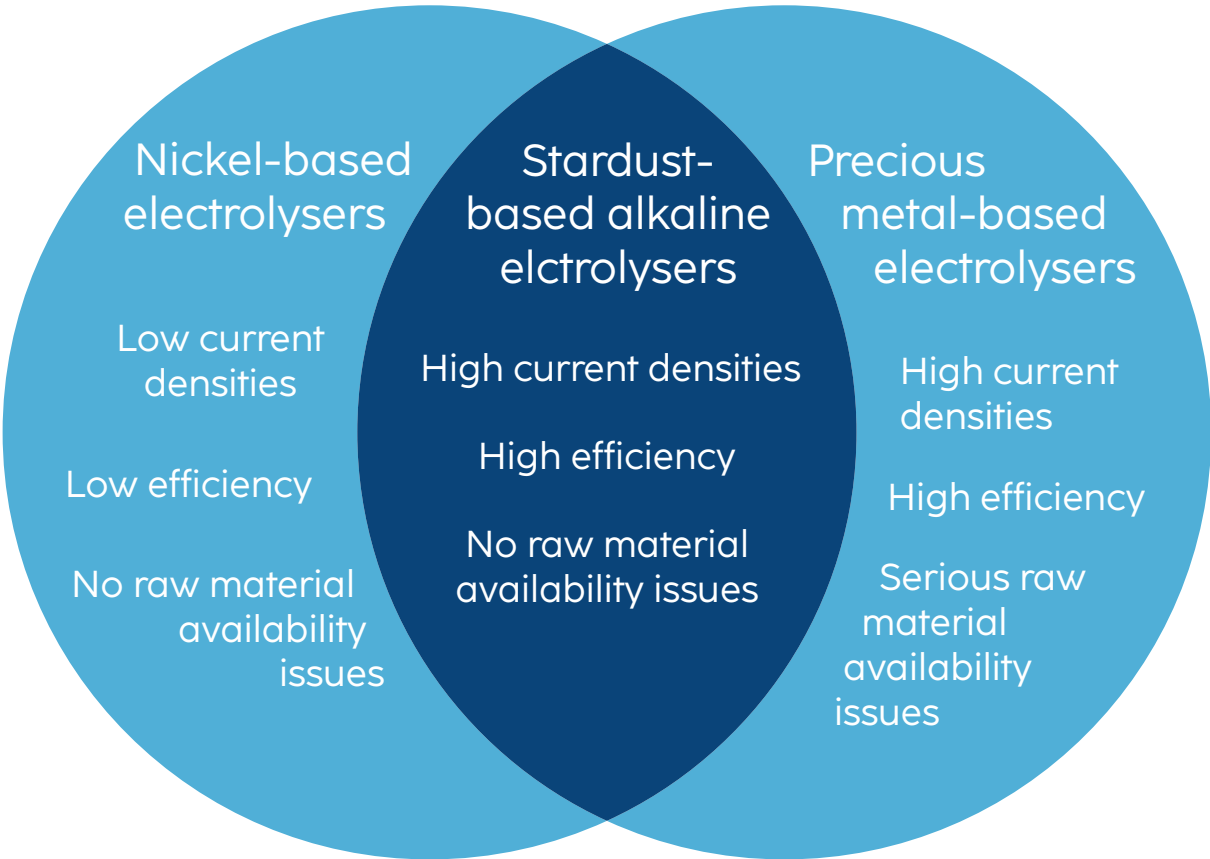
Product	Production capacity	Installed electrical power	Operating range	Delivery pressure	System efficiency	H <sub>2</sub> purity	Electrical input	Ambient temperature range	Certification
	Nm <sup>3</sup> /h (kg/h)	MVA	%	barg	kWh/kg	%		°C	
Starbase 10	2000 (180)	10	10-100	30	52-55 <sup>1</sup>	> 99.999	0.4 - 35 kV	5 to +40	CE-mark <sup>2</sup>
Starbase 20	4000 (360)	20	10-100	30	52-55 <sup>1</sup>	> 99.999	0.4 - 35 kV	5 to +40	CE-mark <sup>2</sup>
Starbase 50	10000 (900)	50	10-100	30	52-55 <sup>1</sup>	> 99.999	0.4 - 35 kV	5 to +40	CE-mark <sup>2</sup>
Starbase 100	20000 (1800)	100	10-100	30	52-55 <sup>1</sup>	> 99.999	0.4 - 35 kV	5 to +40	CE-mark <sup>2</sup>

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, 22<sup>nd</sup> 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



Location : Vao, Estonia



# modernization of diesel locomotive with zero-emission power train

Press release, 7<sup>th</sup> 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



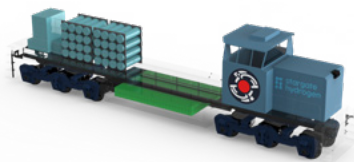
ORIGINAL GE C36-7



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



# contact us



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