



sungreen^{H₂}

REVOLUTIONISING ZERO EMISSIONS

BUILDING THE WORLD'S HIGHEST EFFICIENCY ELECTROLYSER

**ADVANCED
NANOTECHNOLOGY
MATERIALS FOR
ELECTROLYSIS**

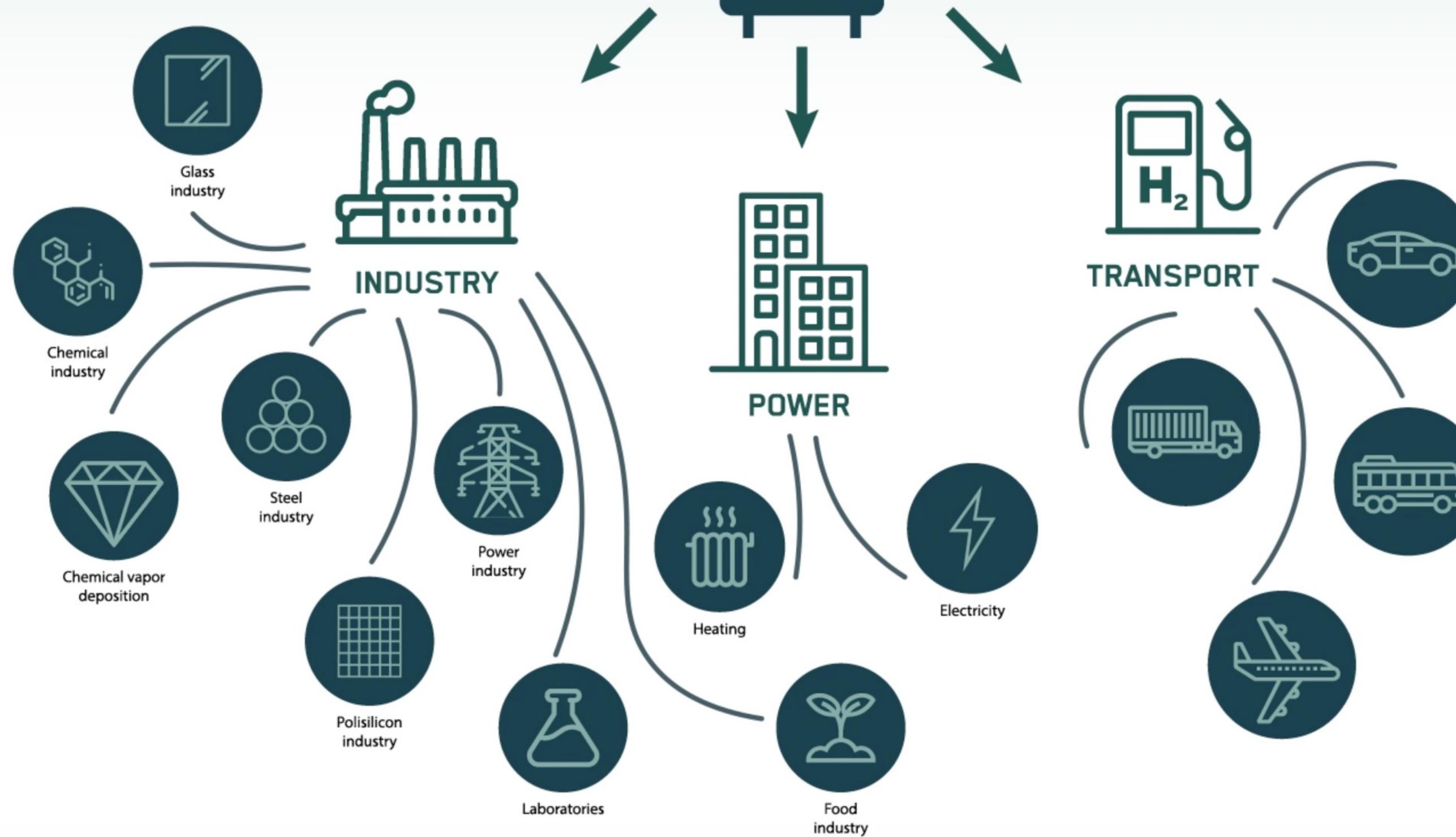
EMA Energy Innovation 2021

23 July 2021

Hydrogen is the most abundant element in the universe



Hydrogen is expanding its areas of application

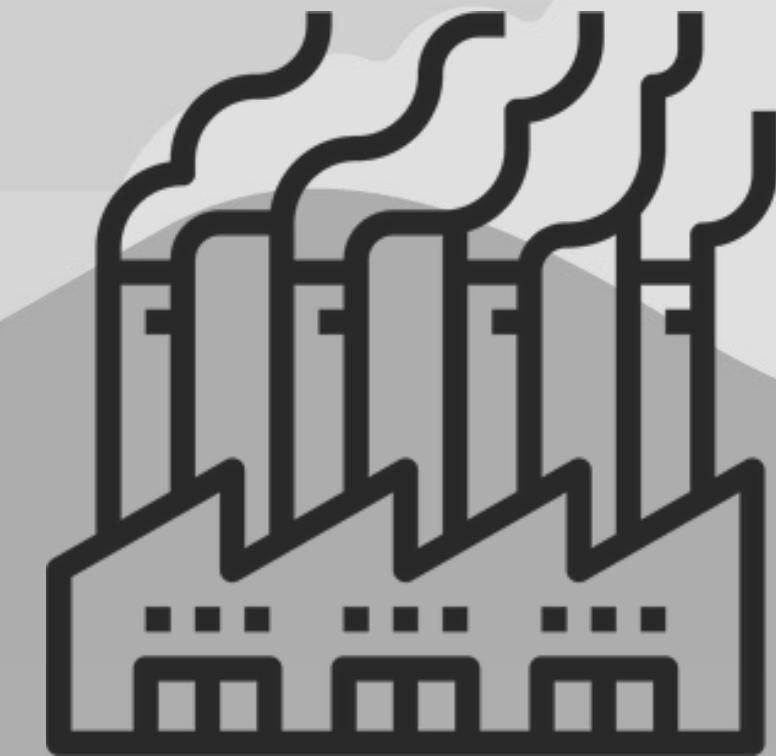




WATER
ELECTROLYSIS



HYDROGEN
PRODUCTION



FOSSIL FUEL
REFORMING

**ZERO
CARBON**
renewable fuel

900 million
tons
CO₂ emissions in
2020

TODAY'S ELECTROLYSERS ARE EXPENSIVE AND INEFFICIENT

KEY INNOVATION NEEDS FOR ELECTROLYSIS SCALE-UP



Durability



Efficiency



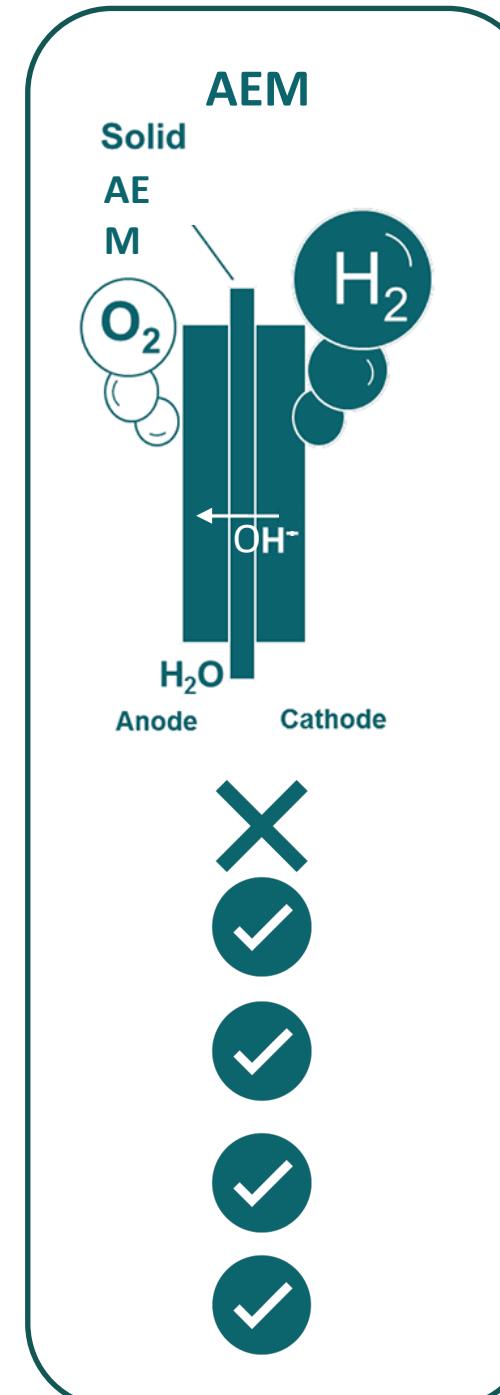
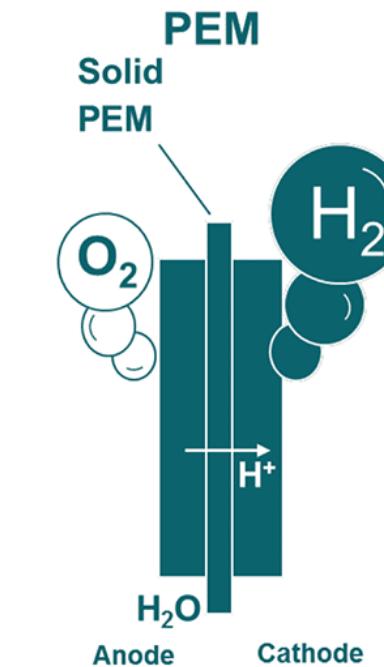
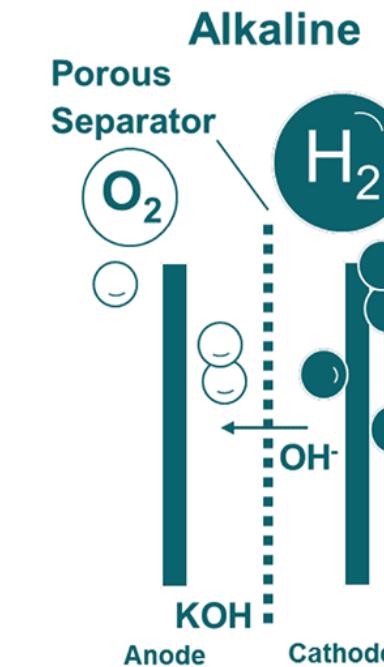
Cost



Platinum Group Metals

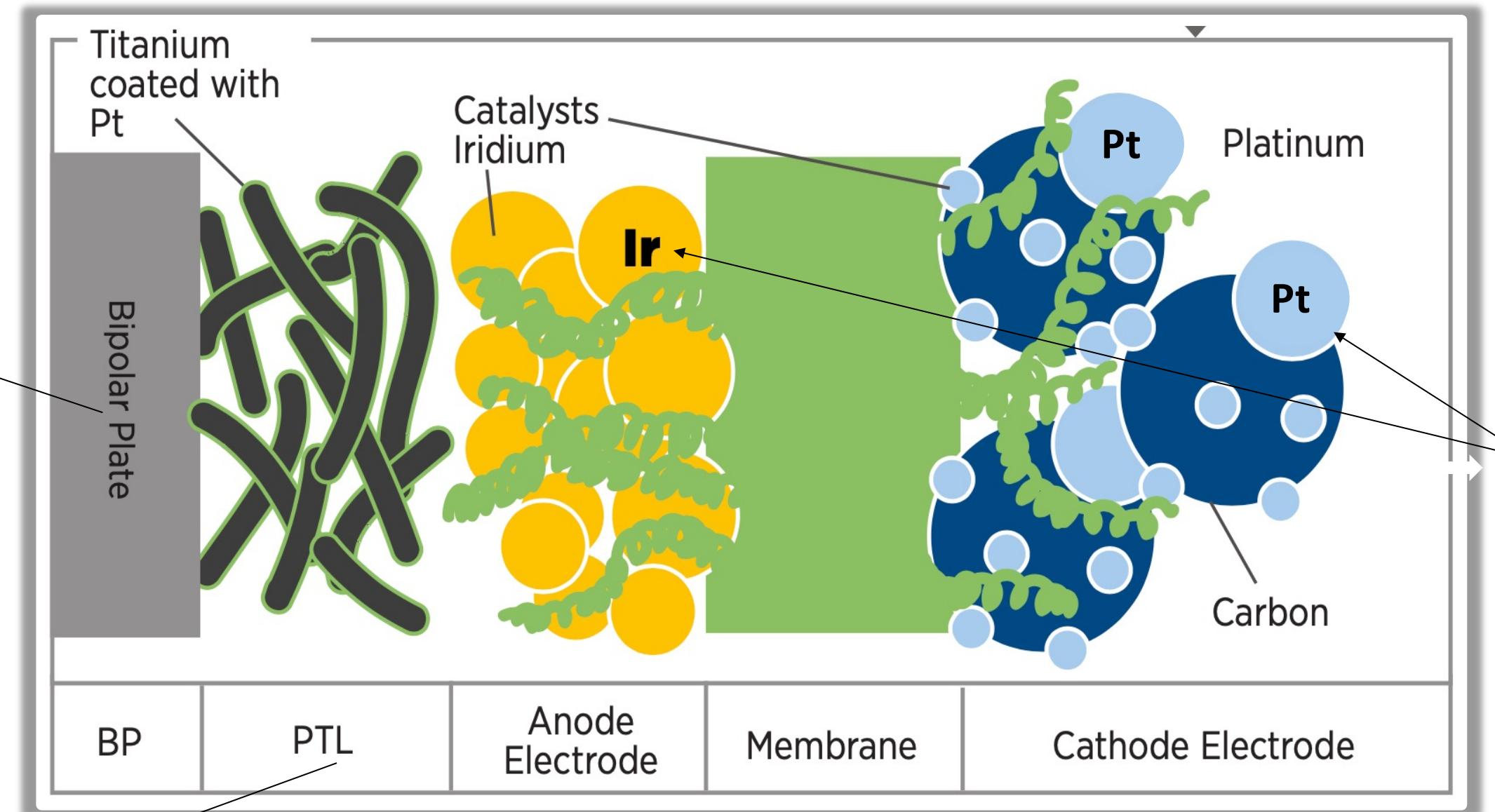


Fast response time



sungreen^{H₂} low cost advanced nanostructured materials for high efficiency electrolysis

REPLACING PLATINUM COATED TITANIUM & GOLD WITH ANTI-CORROSION CONDUCTIVE



REPLACING PLATINIZED TITANIUM FIBER FELT WITH PROPRIETARY COATING

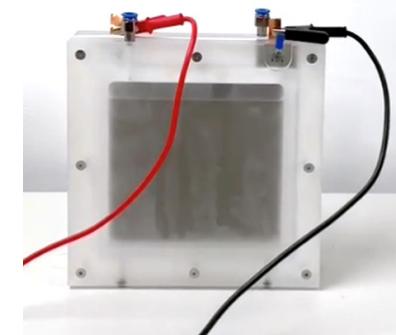
REPLACING PLATINUM, IRIDIUM ELECTRODE CATALYSTS WITH LOW-COST EARTH ABUNDANT MATERIALS

ELECTROLYSER CELL

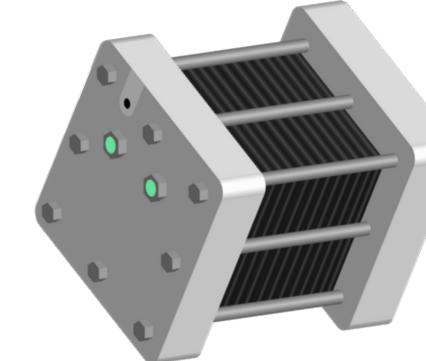
*Source: figure from IRENA, Green hydrogen cost reduction, Scaling up electrolyzers to meet the 1.5 deg C climate goal, 2020

ADDRESSING SCALE-UP NEEDS FOR ELECTROLYSIS

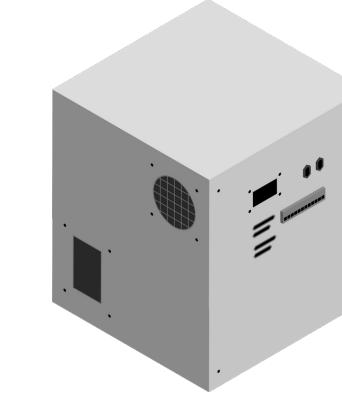
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products



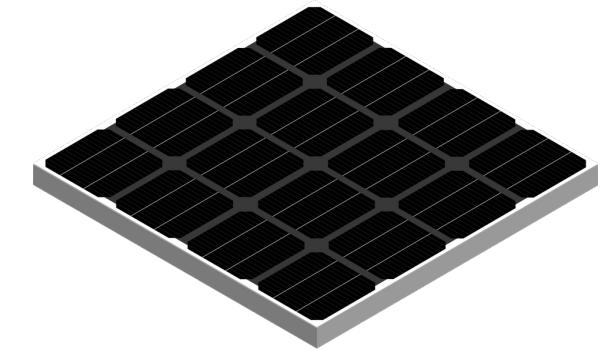
Electrodes & Cells



Stacks



Electrolysers



Solar-to-H2 Panels

⚡ **33%** lower cost vs PEM electrolyzers

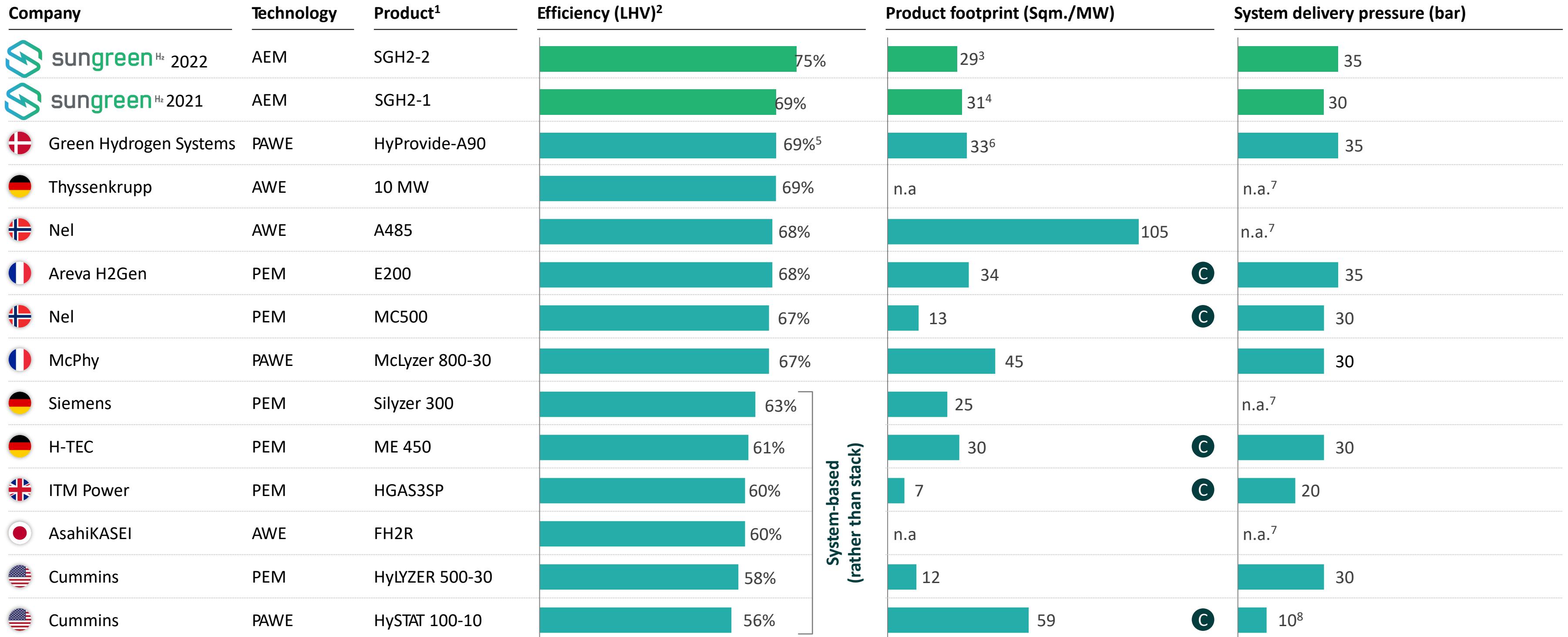
⚡ World leading efficiency **75%**

⚡ **Patented** high performance catalysts

⚡ **6x** lower use of platinum group metals

⚡ **Sustainable & Scalable**

SunGreenH2 vs comparable electrolyser offerings



Footprint for a containerized solution

Reduces uses of electricity

Impacts versatility, LCOH and ease of use

Impacts cost of versatility

Notes:

1) For reference, the most recent, marketable product has been included in the benchmarking. If a product of multiple identical modules is offered (e.g. 4x the same module), the single-module product is shown;

2) LHV = Lower Heating Value. Efficiency is stated in % and calculated as 33.3 kWh/kg (a LHV constant) divided by the product's power consumption in units of kWh/kg;

3, 4) SunGreenH2 is at development stage therefore product footprint is provided on an estimated basis;

5) Green Hydrogen Systems' equivalent system-based efficiency equals 75% excluding dryer losses and 73% including dryer losses;

6) GHS notes this is not directly comparable with other containerized solutions which do not include all auxiliary systems;

7) Not a pressurized technology;

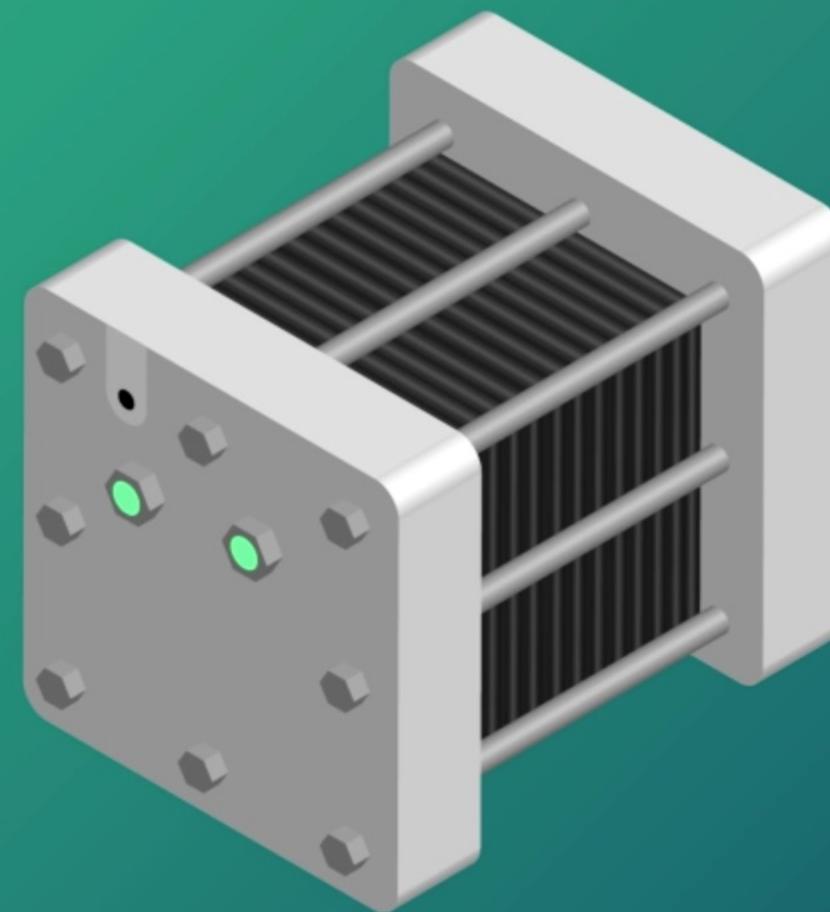
8) 27 bar optional

Source: analysis based on data published by

GHS in \$200M IPO prospectus dated

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products

**SUPPLYING HIGH
PERFORMANCE
ELECTRODES, CELLS
& STACKS**



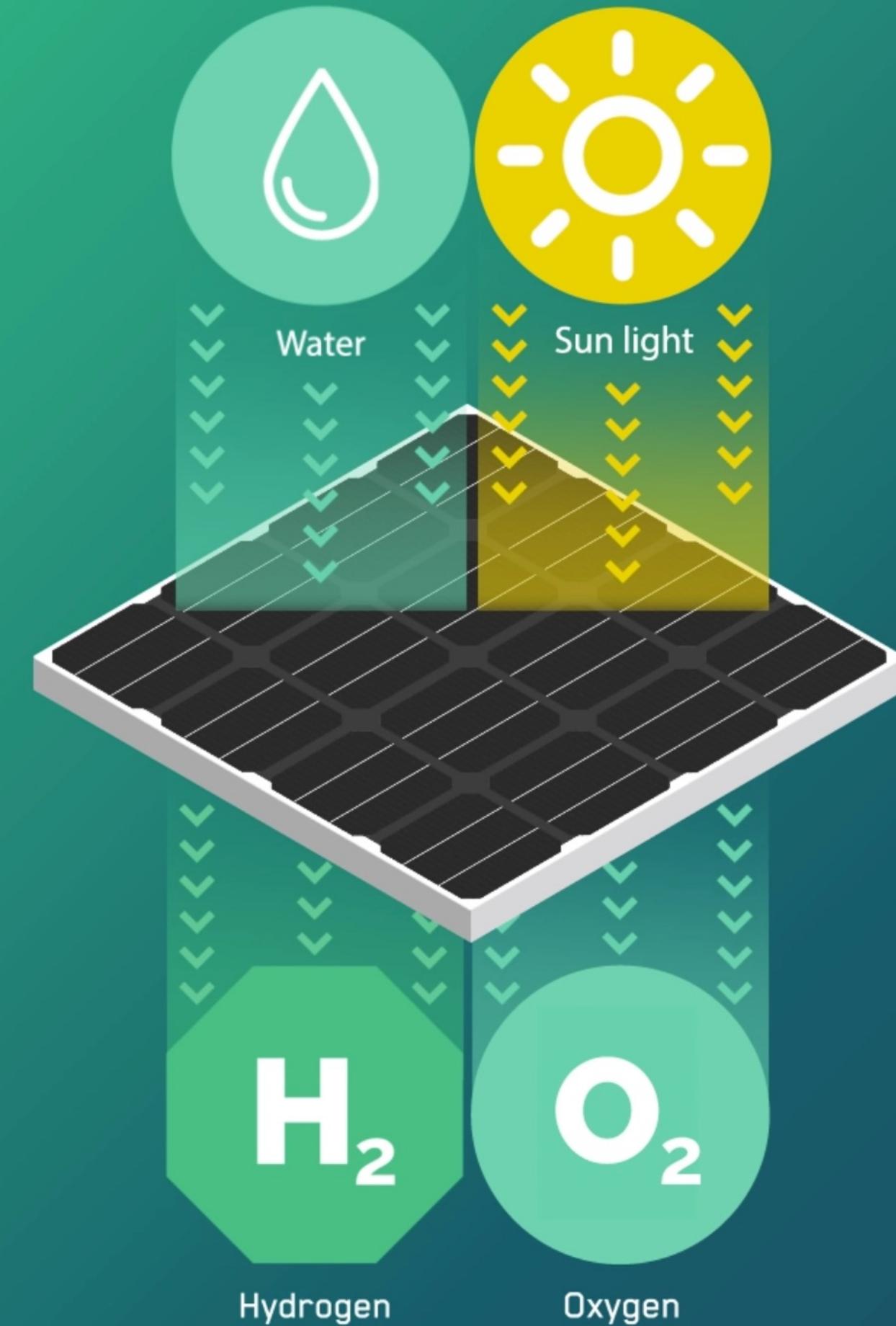
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products

**GROUND-BREAKING
AEM ELECTROLYSER
WITH WORLD LEADING
PERFORMANCE**



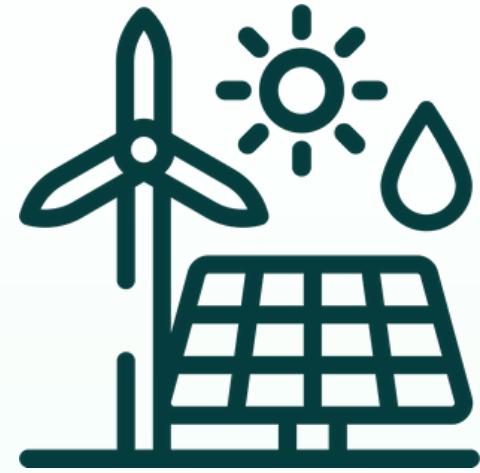
future
sungreen^{H₂}
products

**LOW-COST
HIGH EFFICIENCY
MODULAR
GREEN H₂ PANEL**

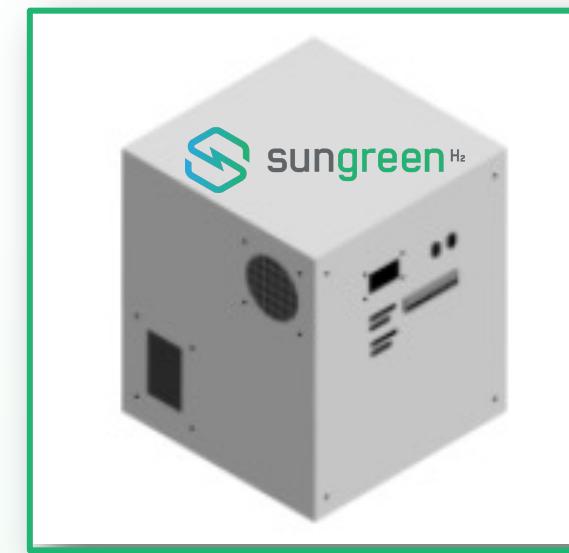


USE CASE

Renewable Electricity



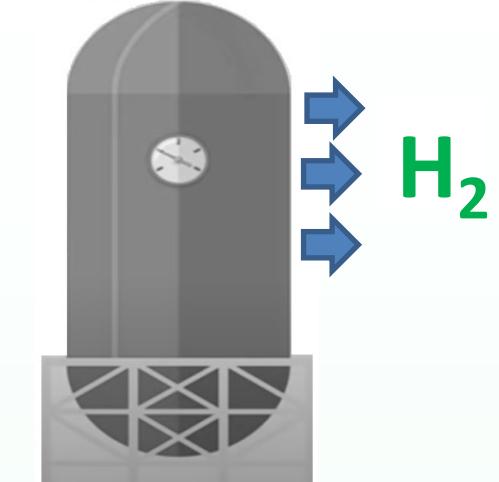
 **sungreen^{H₂}**
Electrolyser



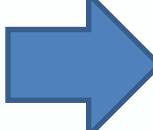
H₂



Compressor



H₂

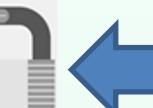


Power Generation

Air



H₂

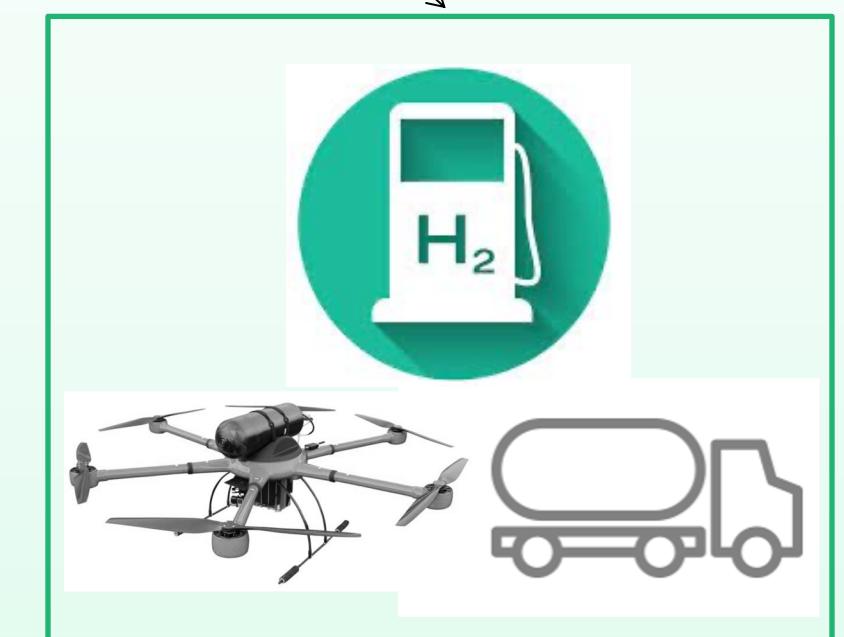


Fuel cell



Storage

H₂



Refueling

Scaling Electrolysers & Reducing Levelised Cost Of Hydrogen

Industrial Scale
TONS/DAY

Container-based
100 KG/DAY

Rack-based
10 KG/DAY

Modular
1 KG/DAY

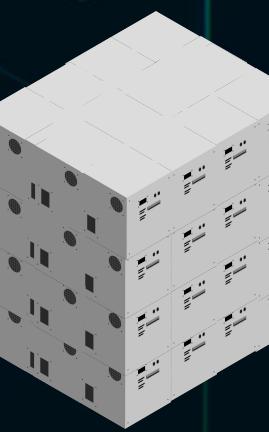
GW Scale
\$ 1.0/kg

MW Scale
\$ 1.7/kg

100s kW Scale
\$ 2.7/kg

kW Scale
\$ 4.9/kg

\$250/kW

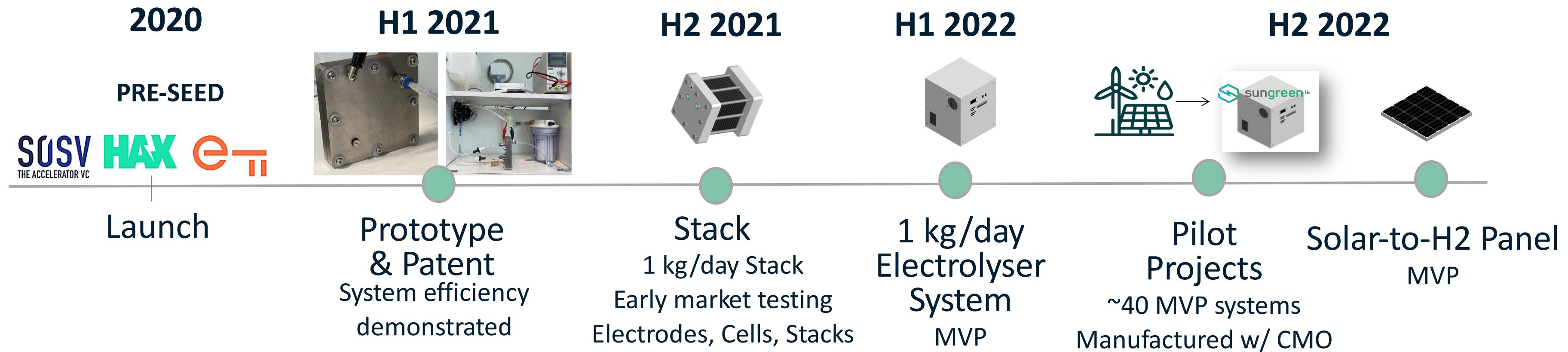

\$500/kW


\$1000/kW


Prototype

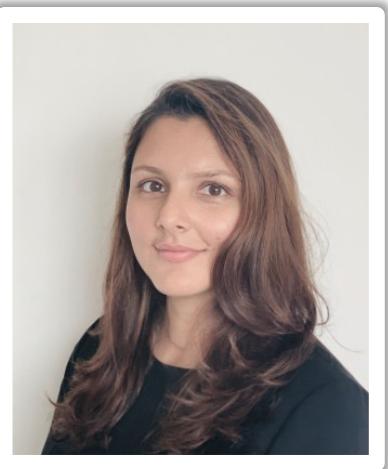



sungreen^{H₂} Roadmap



Team

Tulika Raj



CEO & Founder

MBA, B.Tech. Electrical Engineering

Experienced commercial leader with \$2B transaction experience. Hands-on development and growth of renewable energy companies. 10+ years experience in clean energy investments in solar and wind developers from growth to exit stage, at major energy companies and private equity funds.



Funded and Backed by



Dr Saeid Masudy Panah



CTO & Founder

PhD, Electrical Electronic Engineering

Multi-disciplinary background in Electronic Engineering, Materials Science and Physics. 10+ years expertise in growth and characterization of thin films, nanoparticles and fabrication and characterization of nanoscale devices. Over 70 publications in the field of nanoscale materials and devices.



NANYANG
TECHNOLOGICAL
UNIVERSITY

Institute of
Materials Research
and Engineering
IMRE

WORLD LEADING EFFICIENCY

- 2x cell current density
- 20% higher H₂ flowrate than competition



LOWER COST

- 6x lower use of platinum group metals



MODULAR

- kW - MW - GW systems



GREENER

- Highly compatible with renewables
- Lower power consumption

UNDER PATENT

- Covers major electrolyser technologies

SCALABLE

- Easy to scale
- Roll to roll manufacturing



Contact us

Tulika Raj
(m): +65 8876 7391
(e): *tulika@sungreennh2.com*