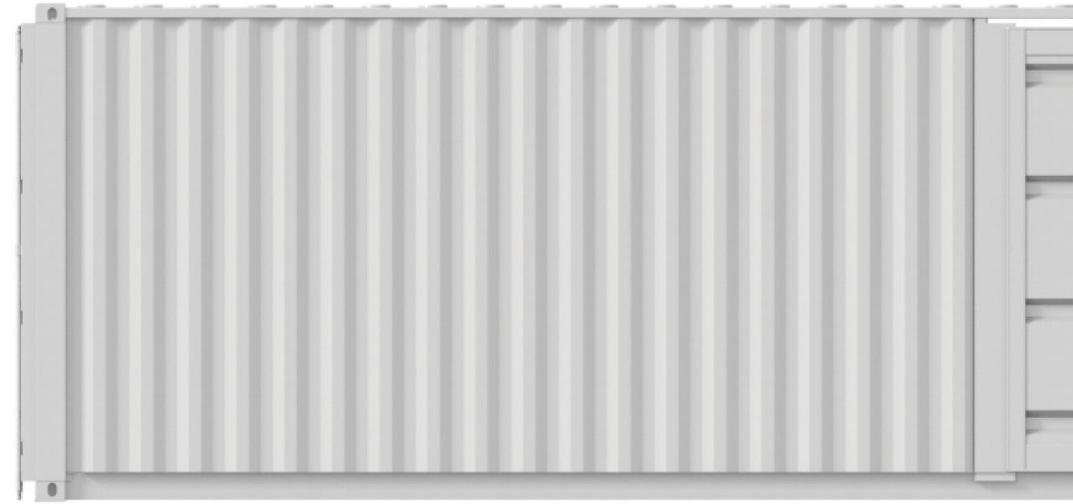
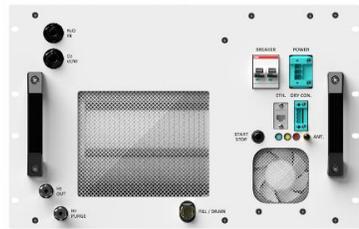
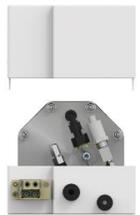


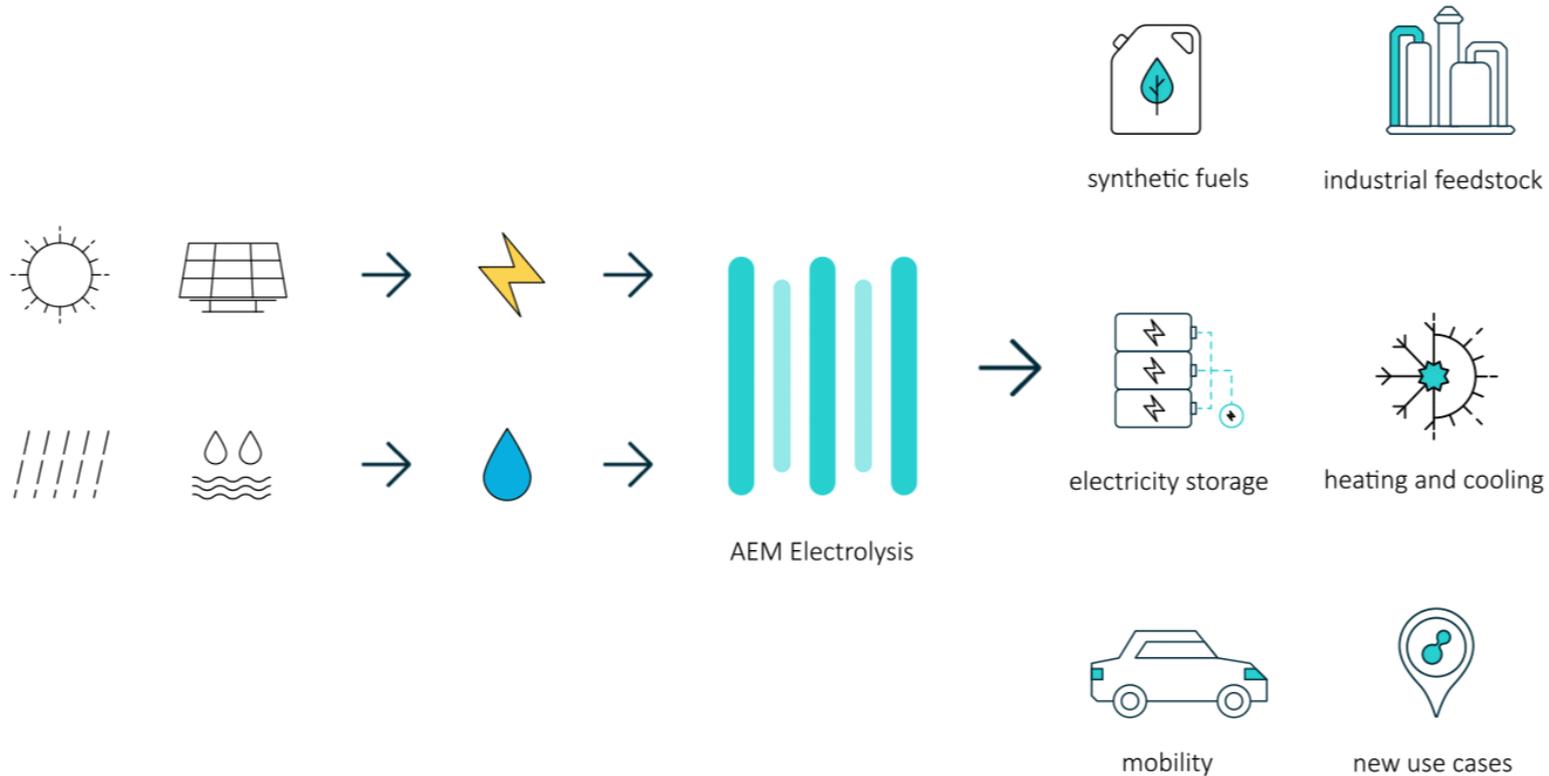


AEM Electrolysers

SMART. SIMPLE. SCALABLE.



The decarbonisation molecule



Green hydrogen is a multi-talent when it comes to replacing fossil fuels.

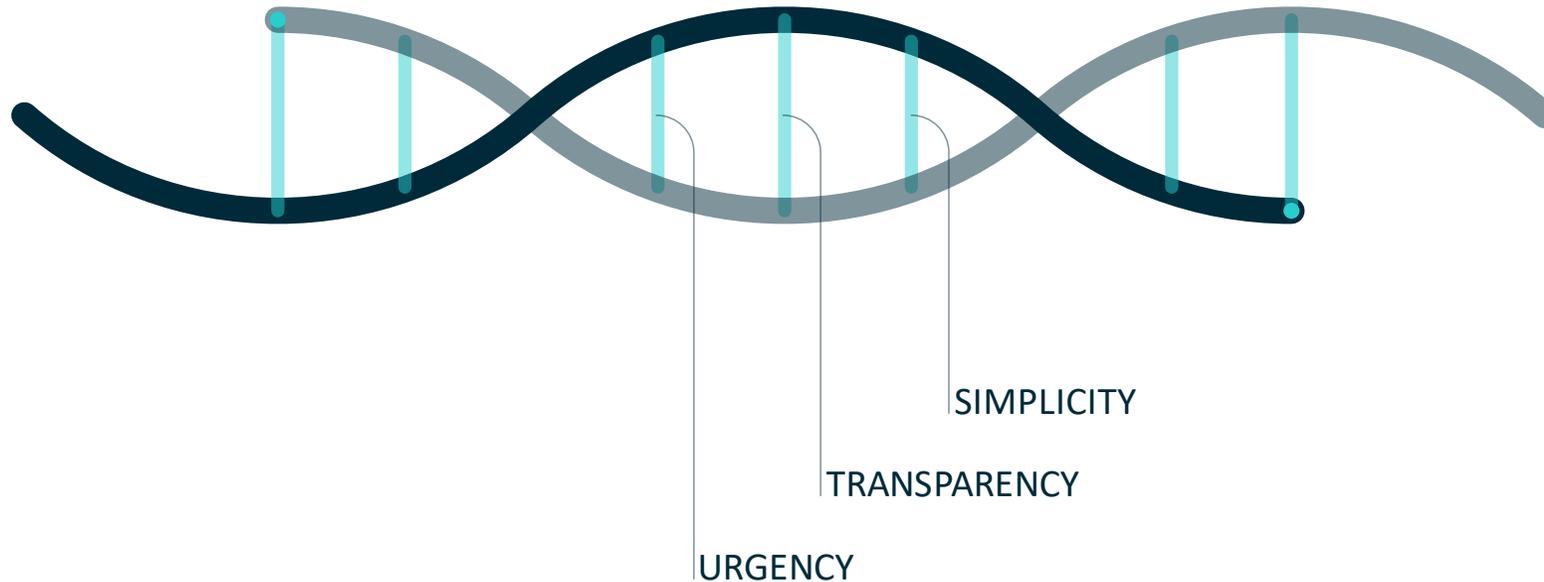
With solar or wind power and water we can provide easily storable, transportable and versatile energy for all applications.

This molecule gives us the tool to decarbonise all sectors – including those that have proven difficult to electrify.



DEEPLY INGRAINED

Our core principles: not an afterthought



Urgency

There's zero time to waste. We can't stop global warming by just talking – as it represents an urgent threat to billions of people. We must act fast to make the energy transition happen.

Simplicity

We work with complex technology. Our daily job is to reduce this complexity to make it actionable. We provide solutions that are standardised and simple so that they can be implemented at rapid speed.

Transparency

Secrets and silos create barriers and slow us down. Transparency enables us to act fast. Clarity in internal and external communications with partners and customers is what we strive for.

Enapter at a glance

Enapter is a rapidly-growing energy technology company. We leverage Anion Exchange Membrane (AEM) tech and its unique advantages. It allows for the mass production of electrolyzers as **products, not projects.**

Based on our projections, we expect hydrogen from AEM electrolyzers to be **cheaper than from any other source.**

Serial entrepreneur Sebastian-Justus Schmidt started Enapter in November 2017. We have since made big strides in developing product and growing to 205 employees by December 2021.

Enapter accessed the capital markets in August 2020 via a reverse merger. We're on the regulated market of the Frankfurt and Hamburg Exchanges (ISIN DE000A255G02).

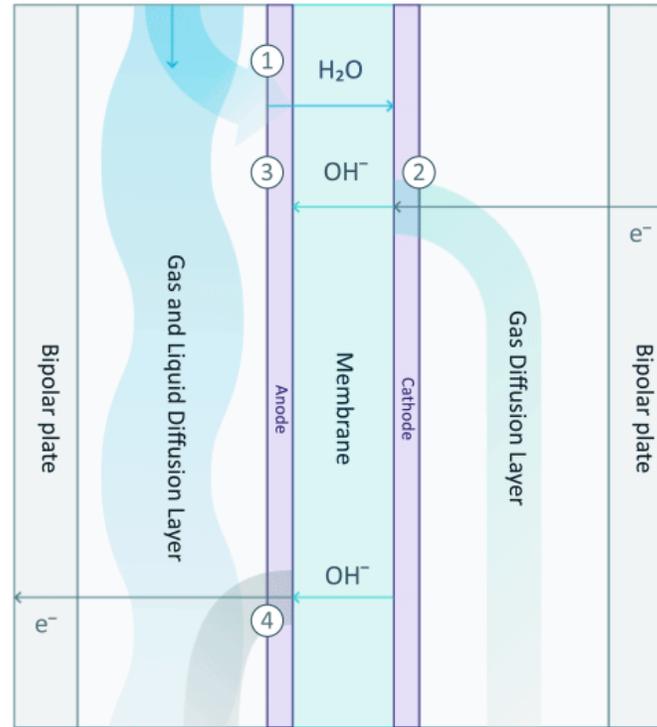
Next up: **scaling our production** and mass producing our AEM electrolyzers.



Our secret sauce

The strengths of our AEM Electrolysers:

- ≡ Combining the best of trad. Alkaline and PEM technology
- ≡ Low-cost materials and setup
- ≡ Top efficiency
- ≡ Easy to install and handle
- ≡ Low OPEX
- ≡ Strong patents granted, more pending



- ① Water travels from the anode half-cell through the membrane.
- ② Hydrogen is produced at the dry cathode and released via the gas diffusion layer.
- ③ OH^- moves back to the anode via the membrane.
- ④ Oxygen is produced from OH^- at the anode and released via the gas and liquid diffusion layer.

■ Water Electrolyte Circulation
 ■ Electron Transport
 ■ Electron and Hydroxide Transport
 ■ Hydroxide Transport

Massive price reduction through commodification at scale



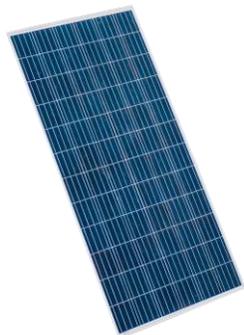
1981



today



2000



today

Throughout economic history, nothing has seen faster growth and cost reductions than mass-produced commodities.

PCs replaced mainframes and, in turn, stripped-down, standardized, and mass-produced blade computers now scale computing capacity to ever lower prices.

Deployment of increasingly-cheap modular solar at scale is undercutting and replacing fossil fuel energy generation.

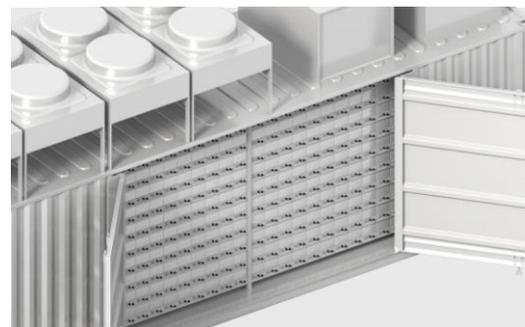
It's green hydrogen's turn.



Massive price reduction through commodification at scale



2019



2023

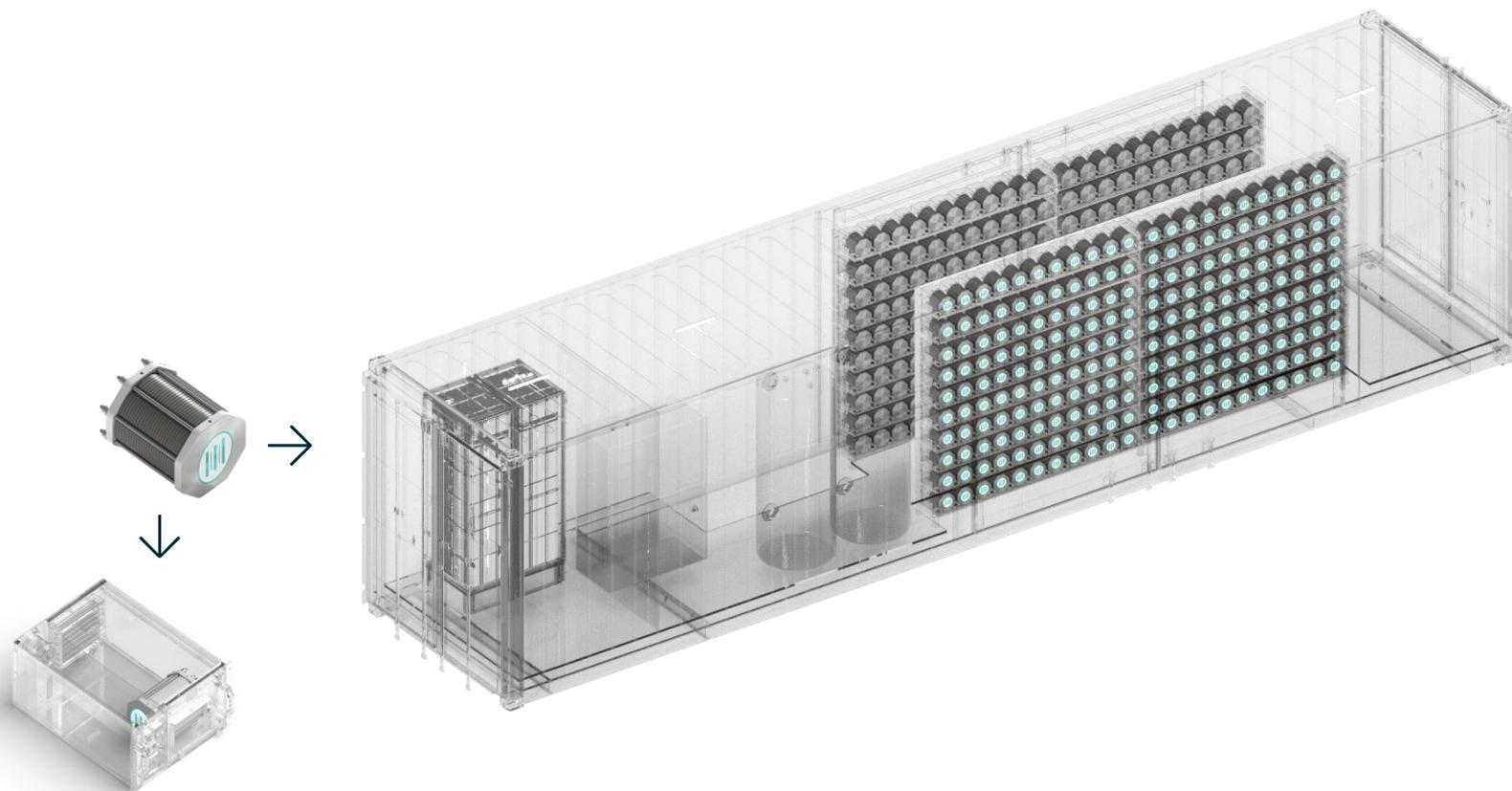
Instead of designing electrolysers as individual engineering projects, Enapter is mimicking the introduction of the PC or the solar panel by making a product that is compact, modular and scalable.

Enapter's approach is unique for green hydrogen production – we are **standardising and mass-producing electrolysers and their cores**, which we believe will yield larger cost reductions faster.

Mass produced AEM stacks and electrolysers **can be stacked to reach any size from kilowatts to megawatts** sizes – for any use.



Modular AEM cores: compact to scale



The "AEM stack" module – a single AEM electrolyser core – is the foundation of Enapter's product platform.

Our mass-produced AEM stack forms the heart of our compact, modular AEM electrolyser, the EL 2.1. But it also delivers megawatt-scale green hydrogen when 420 of them are deployed in our ready-made AEM Multicore system.

This product platform approach allows us to increase our speed of product development, reduce development costs, and rapidly increase product variety.



In-built energy management

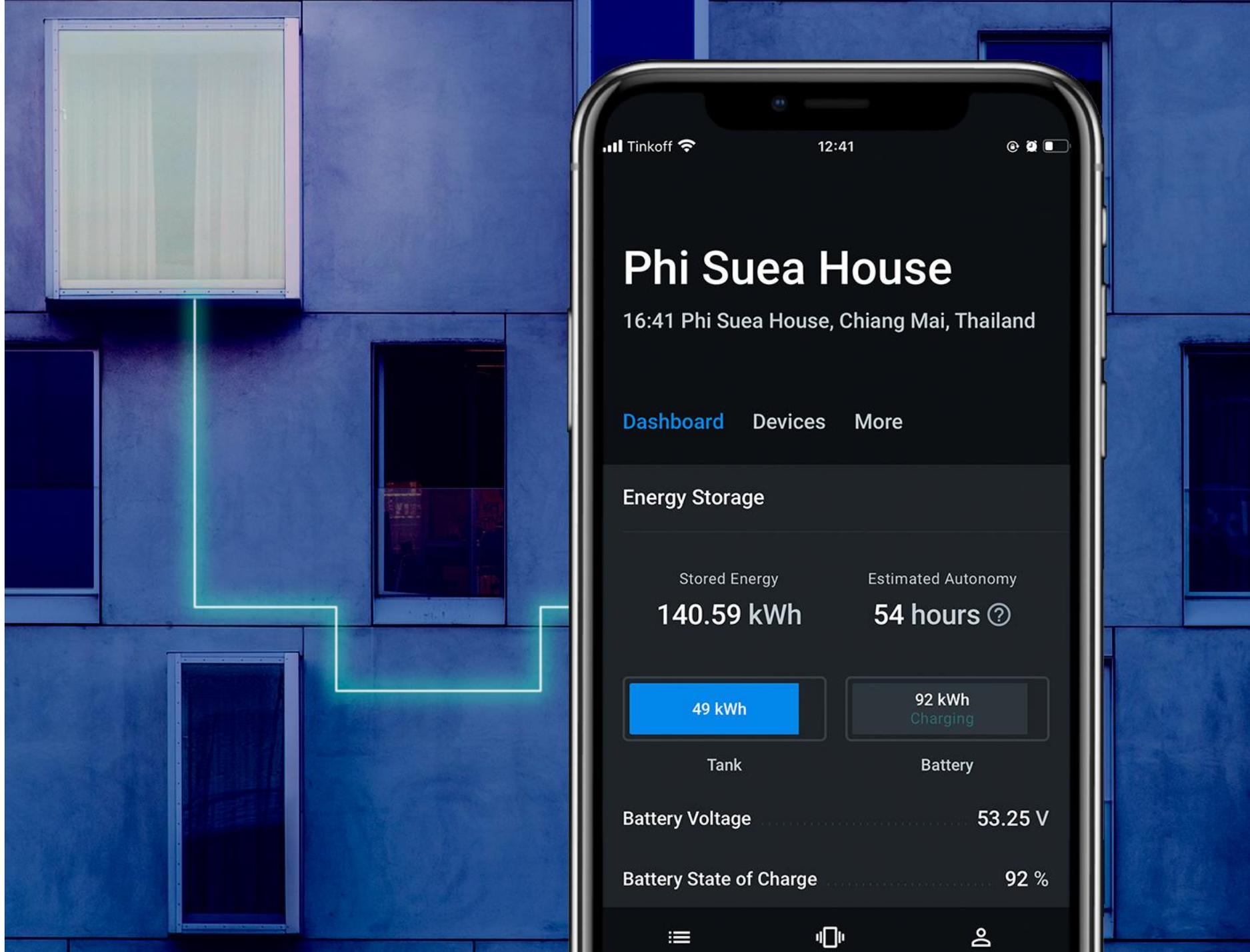
Enapter's AEM electrolyzers are hardware/software hybrids.

This, of course, allows the control of hydrogen production on the go with our mobile and web apps.

But our Energy Management System Toolkit also enables the planning, integration and automated control of energy generation, storage and transmission for any energy system.

We are not just building electrolyser firmware – we are developing an operating system for energy.

More reliability, more hydrogen, more information [here](#).



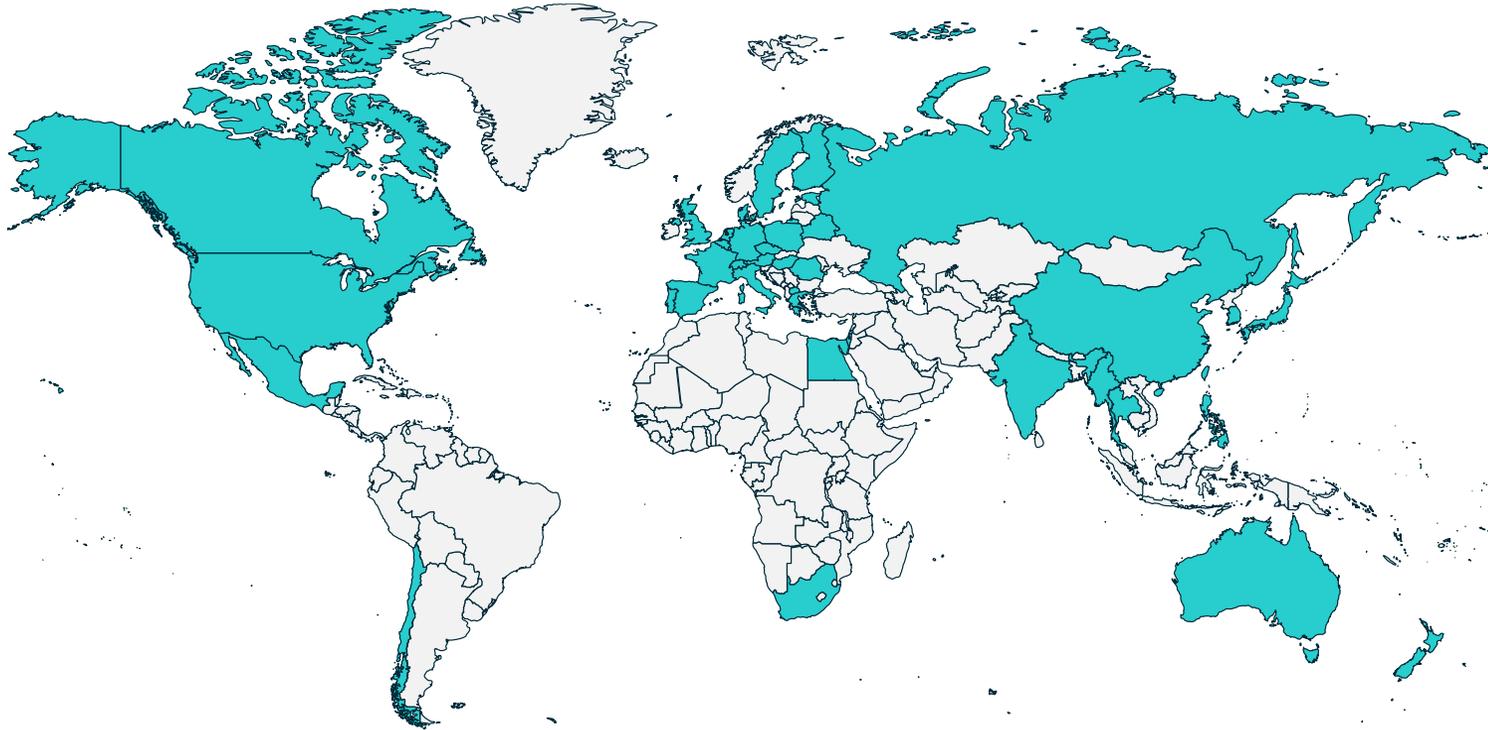
CUSTOMERS AROUND THE WORLD

166 customers in 40 countries to date

Many more [here](#)



Enapter's global product traction



So far, we have shipped electrolyzers to 166 customers in 40 countries.

Currently, we have more than 70 integration partners for our electrolyzers, 27 of them are Certified Enapter Partners.

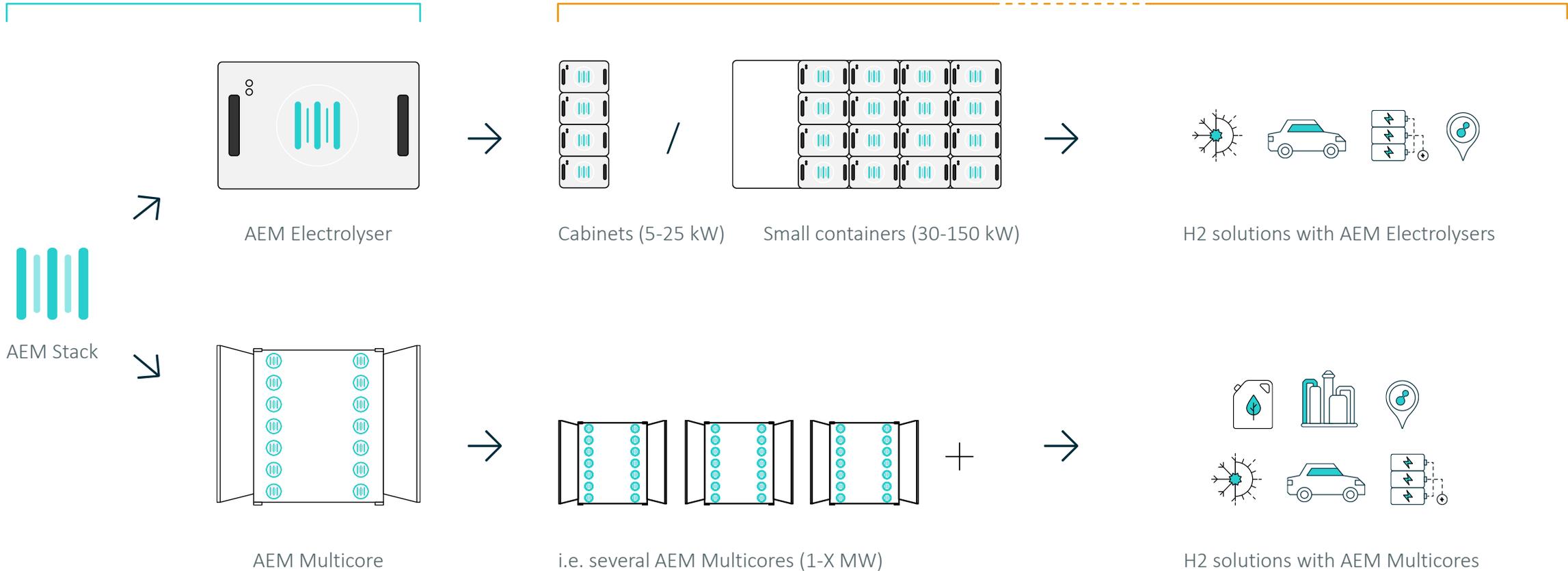
We provide building blocks, integrators create solutions



Enapter's products...

...are stacked by integration partners...

... who build hydrogen solutions for customers.



Scaling production

WHERE WE ARE TODAY

Enapter's rapid growth

2017 – Our first building in Pisa. We renovated it in 2018, now exclusively used for R&D

2019 – Additional building commissioned for serial production

2020 – Further building acquired in Sep 2020 for R&D extension with 8 new laboratories, new testing area and an ISO cleanroom

2021 – Building acquired in December 2020 to scale up chemical and stack production



WHERE WE ARE GOING

Planned mass production in Saerbeck

The Enapter Campus will break ground in September '21 with the construction company Goldbeck.

The factory in the climate community of Saerbeck will be 100% powered by locally produced renewable energy from day 1.

Planned production capacity starting at the end of 2022: 10,000 units/month.



Our
Impact

LIFE CYCLE IMPACT ZERO

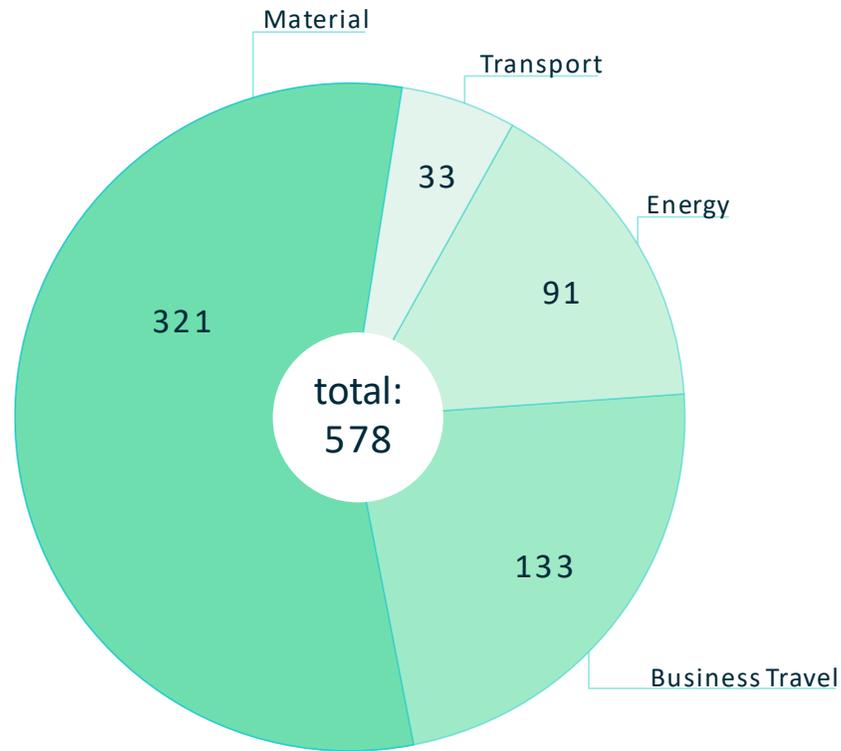
Sustainable industrial production



We're positioning for sustainable industrial mass production. Enapter calls this "Life Cycle Impact Zero":

- ≡ We will source all our energy 100% from local renewables, the majority of which we will produce ourselves.
- ≡ The Enapter Campus will have a minimal carbon footprint
- ≡ We aim to eliminate all harmful emissions through our product life cycle - production, assembly, maintenance, disposal and recycling.
- ≡ The Enapter Campus will contain a facility to accept end-of-life electrolysers and guarantee a full recycling process.
- ≡ Read more on Life Cycle Impact Zero [here](#).

A tiny carbon footprint for massive impact



EL 2.1 Carbon Footprint (in kg CO₂eq)

Our electrolyzers emit only hydrogen, oxygen and some water vapor during operation – none of this is harmful to the environment or humans. Zero pollution!

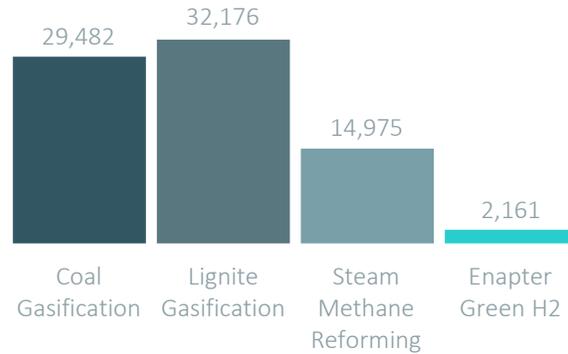
We recently made a carbon footprint (CFP) analysis for our EL 2.1 electrolyser (see chart). Its carbon footprint is **~578 kg CO₂ equivalent (CO₂ eq) - half of a typical solar panel's CFP!**

Indirect emissions must be accounted for the CFP of the wind or solar devices supplying energy to the electrolyser. Over the lifetime of the EL 2.1, we assume a mean value of 1,582 kg CO₂ eq from these devices.

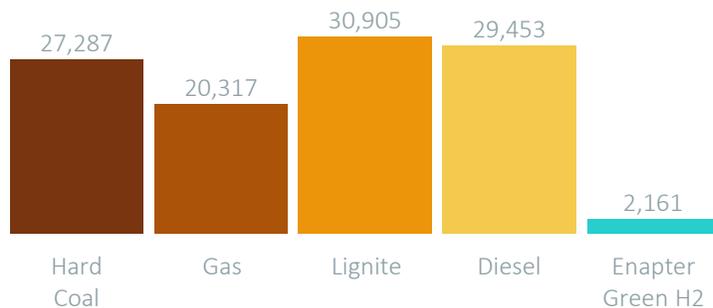
In short, the total emissions from running the EL 2.1, combining its carbon footprint and indirect emissions from renewable energy, are 2,161 kg CO₂ eq over the lifetime.

Potent emission-cutting potential

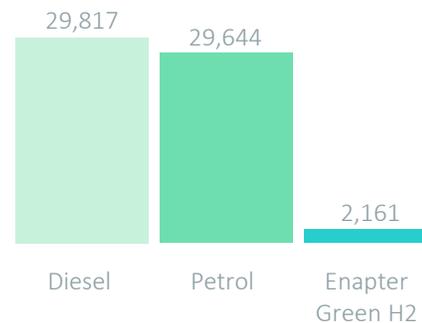
EMISSIONS OF HYDROGEN PRODUCTION METHODS*



EMISSIONS OF POWER GENERATION*



EMISSIONS OF DRIVING 165.605 KM*



Green hydrogen from Enapter electrolyzers delivers:

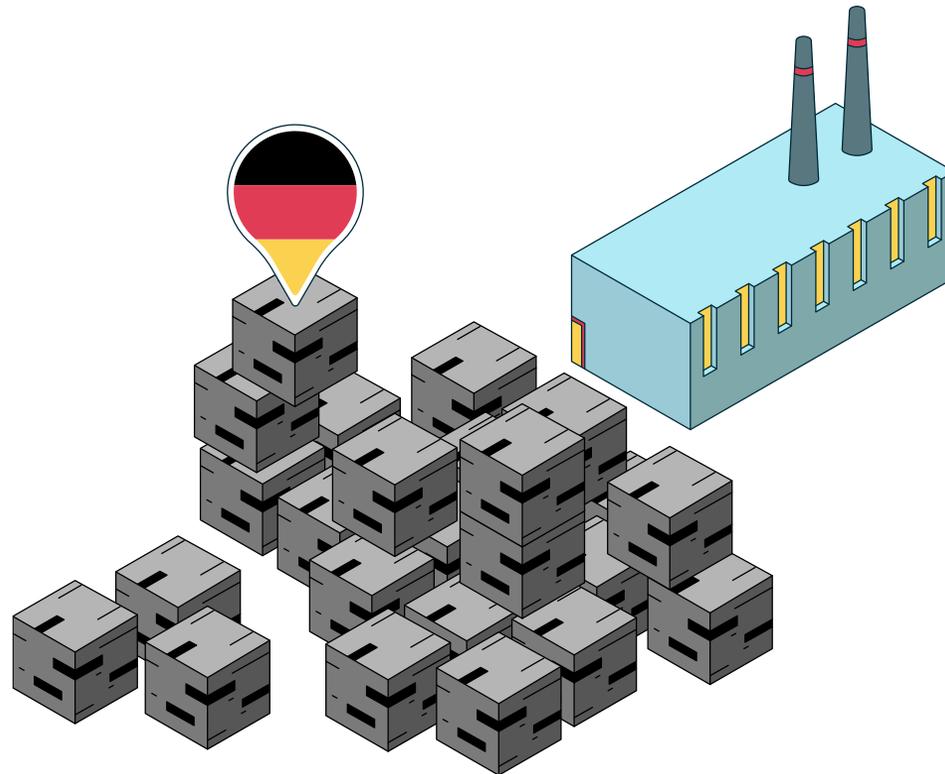
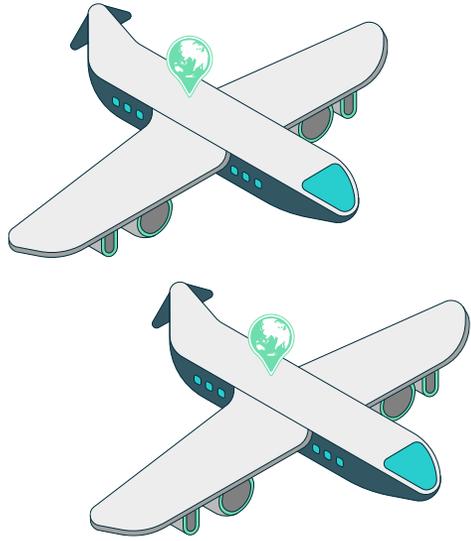
- ≈ 89-93% reduction of CO₂ eq emissions when replacing fossil fuels for power generation
- A ≈ 93% reduction when replacing fossil fuels for transport
- ≈ 86-93% reduction of CO₂ eq emissions when replacing grey hydrogen from fossil fuels.

Using our green hydrogen to replace fossil fuels in these areas also reduces pollutants such as N₂O, CO, Particulate Matter (PM₁₀, PM_{2.5}), CH₄ and NO_x to zero.

*CO₂ eq, calculated over the lifetime of one EL 2.1 Electrolyser

FOR CONTEXT

CO₂ mitigation potential



Green hydrogen from Enapter electrolyzers produced by 2030 could mitigate the CO₂ equivalent of **2 years of global air travel at pre-Covid levels.**

Green hydrogen from Enapter electrolyzers produced by 2050, could mitigate CO₂ emissions **equivalent to the lifetime emissions of all of Germany's current coal-fired power plants.** Just like they were never built.

Certification

WE ARE CERTIFIED:

- ≡ ISO9001 Quality Management
- ≡ CE-certification according to Machinery Directive for our main products

WE ARE PURSUING:

- ≡ CE-certification and compliance to ISO22734 for future electrolyser products

WE PLAN TO PURSUE IN THE FUTURE:

- ≡ ISO14001 Environmental Management System
- ≡ ISO/TS 16949 Automotive Quality Management
- ≡ ISO 45001 Health and Safety



Summary: Why AEM electrolyzers scale worldwide

1. PRODUCT PLATFORM

Our AEM electrolyzers are standardised building blocks for any use case or amount of hydrogen.

We develop and manufacture a commodity product – just like the solar panel. We make our products in a matter of minutes.

Our products go into a wide variety of energy projects. We are not energy project developers...



2. PARTNERS

... but our partners are. We have 27 Enapter Certified Partners developing projects on all continents and many more clients integrating our electrolyzers.



We share our knowledge and experience with the world via our online handbook. Hydrogen will become as easy and accessible as solar power and gas cooking.

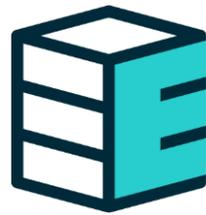
3. PRODUCTION

We can completely automate mass-production – with the upcoming Enapter Campus serving as our pilot mass production facility.

Production has no resource or location dependency. The Campus is a blueprint that is planned to be replicated in other parts of the world, scaling while maximising local impact.

Together, the low material costs for AEM, standardisation and mass-production will, we believe, create the lowest cost hydrogen.





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