



Battolyser Systems

Unlocking 100% green hydrogen

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Battolyser Systems is an innovative electrolyser producer enabling 100% green hydrogen at lowest LCOH.

The Battolyser® is the world's first electrolyser that can instantly switch on and off following intermittent renewable energy production. It unlocks the full power of renewable energies getting us to net zero faster and more affordably.

With its 100% flexibility, Battolyser® unlocks new ways to significantly reduce your LCOH. It allows production of hydrogen when cheap renewable power is available and to simply turn off production when renewable power is not available.

This way it delivers 100% green hydrogen. In addition, its integrated battery functionality unlocks revenues from trading electricity and lowers required investments in off grid renewable projects. Resulting in the lowest LCOH.

Battolyser® is intrinsically safe in any operational mode, even at low and rapidly changing loads. Its patented nickel-iron technology is inherently robust and has industry leading efficiency and durability.



“We deliver 100% flexible and scalable solutions that unlock project value and bring society faster to net zero”
CEO - Mattijs Slee





What makes Battolyser unique?

Today green hydrogen projects are often locked and very limited project FID are taken. We deliver new ways to significantly reduce LCOH and realize viable business cases, hence unlocking projects that can deliver 100% green hydrogen.

Battolyser® is a 100% flexible electrolyser with integrated battery capacity. It can follow highly volatile renewable energies and switch instantly and safely between hydrogen production and electricity discharge, leading to the lowest LCOH. By instantly following the intermittent nature of renewable energies, Battolyser® ensures the production of 100% green hydrogen.

1. Operating range

Battolyser® is the only electrolyser with an operating range that goes below 0%. Not only can you turn the system down to zero to prevent producing hydrogen from expensive non-renewable energy, but you can even revert it and sell power back to the grid. In an off-grid project, the battery functions as back-up power when no renewable power is available.

2. Conversion efficiency

Battolyser® offers unprecedented stack efficiency of up to 85% at 30 barg outlet pressure. Save money on the largest cost component of green hydrogen, which is power and produce pressurized hydrogen at a system efficiency of 50.1 kWh/kg.

3. Robust to market changes

When energy prices are high, it may be more attractive to sell stored power rather than producing hydrogen. If the offtake of hydrogen is interrupted, Battolyser® can generate value as a battery. It's an asset that lets you arbitrage between hydrogen and power markets.

4. Product lifetime

Battolyser® uses proven stable nickel and iron electrodes with a regenerative catalyst that is not subject to electrochemical degradation reducing the efficiency and expected lifetime, common in conventional electrolysers. The low operating temperature and alkaline electrolyte also ensure benign conditions and offer increased stack longevity.

5. 100% green hydrogen

Europe's Renewable Energy Directive (RED II) provides valuable credits for hydrogen produced from additional, local and time-correlated renewable sources. Battolyser's inherent flexibility allows you to follow any renewables load curves, comply with the strictest rules for temporal correlation, and produce 100% green hydrogen.

6. Low-cost raw materials

Battolyser® uses only iron and non-battery grade nickel electrodes, which are both abundant low-cost raw materials. The rest of the system also uses low-cost materials, due to the low temperature and alkaline environment, resulting in a much more affordable system overall.

7. Secure supply

Battolyser® is made from abundant raw materials delivered via secure supply chains required to meet the scale of an independent energy transition.

“Battolyser Systems is ready to scale up production and unlock the required gigawatt scale green hydrogen projects by 2030.

The technology has been proven at industrial scale and we are on schedule to go from MWs to GWs. “



Scan the QR code to download our case studies.



Applications and markets

Battolyser® is a platform technology that due to its flexibility and battery capacity can enable lowest cost green hydrogen for a wide array of applications and use cases. The world's increasing demand for green hydrogen will differ in time per application and geography.

Battolyser Systems can deliver solutions that add value in on grid and off grid applications as well as in applications with either a flexible or base load hydrogen offtake profile.

On & Off grid applications

In ON grid applications Battolyser® uses its flexibility to lower the power costs and add additional revenue streams via electricity trading and balancing the grid.

In OFF grid applications Battolyser® reduces or even eliminates the need for additional backup power to fulfil a project's base load power requirements.

It reduces overall capex, storage, footprint, and maintenance costs by using one integrated system (instead of an electrolyser plus a battery) that can easily deal with directly coupled intermittent renewable power.

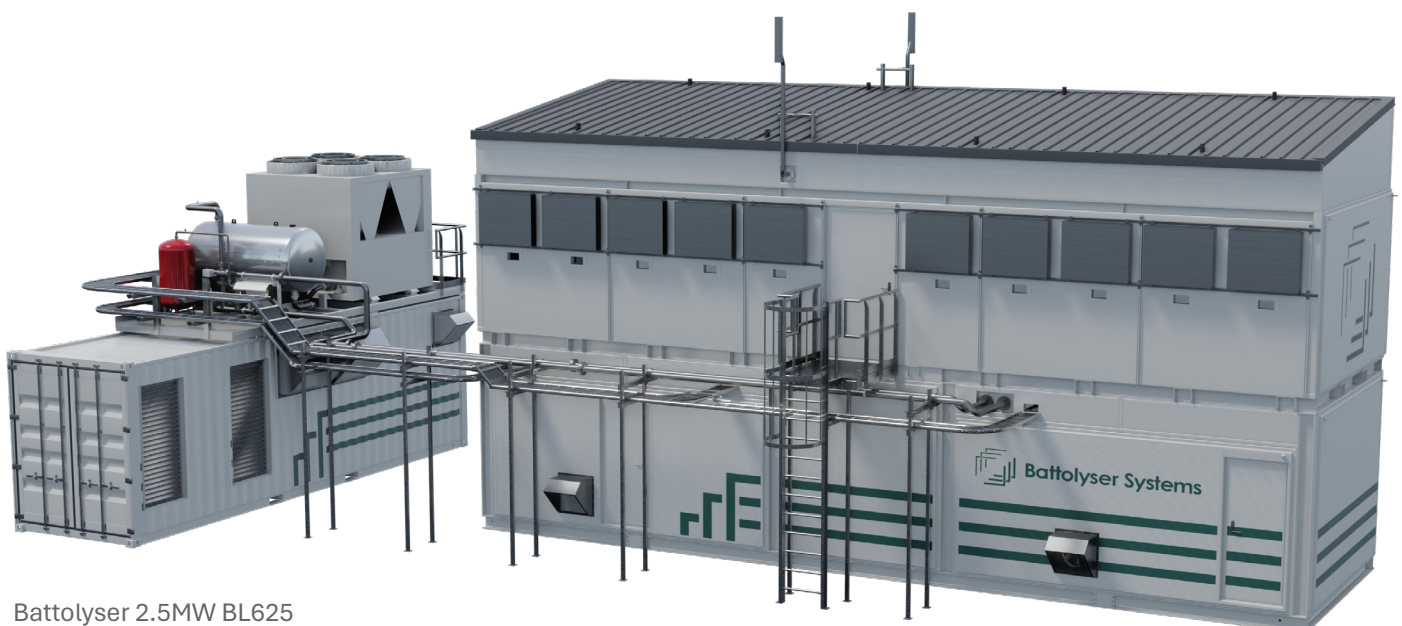
Flexible and base load hydrogen offtake applications

Battolyser® is fully flexible and can thus produce hydrogen when power prices are low. If there are no minimum off take requirements this results in the lowest levelized cost of hydrogen (LCOH).

Flexible green hydrogen production at low cost can be combined with existing grey H2 streams or injected into pipeline or storage systems to supply a baseload of hydrogen to the industrial off-takers.



Scan the QR code to download product specifications.



Battolyser 2.5MW BL625



Based on expected green hydrogen demand Battolyser Systems aims to serve the following market segments:



RENEWABLE ENERGY

A revenue upgrade and congestion solver. As a solution to grid congestion and curtailment challenges, Battolyser® enhances the economic viability and operational stability of renewable energy projects. It converts the surplus of renewable electricity into valuable green hydrogen, allowing the expansion of renewable energy sources even in constrained grid environments.



METHANOL

Making small scale green methanol in industrial clusters possible. The production of green methanol requires CO₂ and green hydrogen as feedstock. Green methanol projects will develop in industrial clusters where concentrated CO₂ is available and where Battolyser® can supply low cost green hydrogen on site by trading in power markets.



LOW CARBON FUELS

Making transportation fuels compliant with increasingly stringent regulations. Transportation fuels production requires hydrogen in the refining process. Using green hydrogen instead of fossil-based hydrogen reduces the carbon intensity of the fuel to meet regulatory requirements. Battolyser® can produce the lowest cost 100% green hydrogen compliant with Renewable Energy Directive (RED II).



DECENTRAL ENERGY HUBS

Solving decentral energy challenges. In decentral energy hubs with hydrogen demand from mobility, industry and agriculture, Battolyser® enables integration of local renewable energy sources with congested grids and local production of hydrogen.



AMMONIA

Making off-grid green ammonia affordable at scale. Green ammonia will be produced in areas where renewable energy is cheap and abundant. These large-scale projects will be operated largely off-grid where Battolyser® has the unique value to eliminate the need for additional battery backup power and allow direct connection with renewable energy sources.



STEEL

Reducing the carbon intensity of steel production. Conventional coal-based blast furnace steel production will gradually be replaced by Direct Reduced Iron (DRI) production requiring large quantities of green hydrogen. Battolyser® can deliver green hydrogen as required by the DRI production process, or to deliver lower cost intermittent green hydrogen that is combined with natural gas to lower the carbon intensity of the produced steel.

Regulation compliancy

Looking ahead, Battolyser Systems is set for fast growth in an expanding market. The regulations in Europe and USA mandate a strong demand for green hydrogen towards 2030. Currently the green hydrogen market faces some headwinds, due to higher interest rates and lagging regulations that cover the cost premium. We expect that the market demand will solidify: strict regulations will be combined with government support in the next years in order to unlock large scale green hydrogen projects.

Battolyser Systems is prepared for success through being future proof to all relevant hydrogen regulations in Europe and the USA. We enable 100% green hydrogen production, local manufacturing of net-zero technologies and support greater strategic autonomy.

Renewable Energy Directive (RED II)

Europe's ambition is to produce 10 million tonnes and import 10 million tonnes of green hydrogen in the EU by 2030. The EU's strict requirements for hydrogen products to qualify as "renewable" and its support for renewable hydrogen over natural gas-derived hydrogen are expected to shape the global market and have repercussions for emissions standards and trade.

Battolyser® is compliant with all EU hydrogen regulation matching the strict criteria to be qualified as renewable defined by RED II.

This directive provides valuable credits for hydrogen produced from additional, local, and time-correlated renewable sources. Battolyser® can be directly connected to renewable assets, instantly switch to power that would have been curtailed otherwise, and comply with additionality and hourly temporal correlation criteria.

The significant energy import volume of the EU will also cause a major push for RED2 compliant green hydrogen production and derivatives like ammonia in favourable regions for renewable energies like the Middle East, North Africa, and Saudi Arabia.

Net Zero Industry Act

The EU Net Zero Industry Act (NZIA) will ensure manufacturing of net-zero technologies in Europe at scale. It targets that at least 40% of the EU hydrogen consumed is produced with European electrolyser technologies.

European and National incentives such as local-content like requirements embedded in public funding will further support this.

Critical Raw Materials Act (CRM)

The Critical Raw Materials Act aims to reduce strategic raw material dependencies on countries outside Europe. Battolyser Systems is at pole position to support this. Unlike conventional PEM/SOEC electrolysers, Battolyser® does not require any Critical Raw Materials. It only requires globally abundant iron and low-grade nickel, offering low-risk supply chains.

European technology

The European market will act as a stepping stone to the US/MENA and Australia. Many of these markets provide initial production for export to Europe and as such will need European compliant technologies.

REPowerEU

“ The European Commission ambition is to produce 10 million and import 10 million tonnes of renewable hydrogen in the EU by 2030. ”



Why choose us?

BATTOLYSER®

If you are developing a green hydrogen portfolio, you need a technology that provides the lowest levelized cost of hydrogen, is capable of following any renewable load curve, and is scalable without supply chain constraints. Only a Battolyser® can offer the lowest cost and 100% green hydrogen.

Invest in technologies that can meet the scale of the energy transition all the way to net zero. Battolyser® is now available to support achieving this goal.

LOWEST HYDROGEN COST

Battolyser® can achieve the lowest power cost, thanks to its high efficiency and ability to arbitrage between selling power and producing hydrogen.

100% GREEN HYDROGEN

Battolyser® has the unique capacity to produce 100% green hydrogen, instantly following local intermittent renewable energy sources. It is the solution to move towards a net zero energy system.

SCALABLE SUPPLY CHAIN

Battolyser® is a EU compliant electrolyser technology with no dependence on critical raw materials, based on secure supply chains and 'made in Europe'.

AVAILABLE MODULES

Battolyser® is available in modules of 2.5MW, 5MW and 25MW.

Module	2.5MW	5MW	25MW
Availability date	Delivery Q1 2025	Delivery Q2 2025	Delivery Q3 2026
Stack type	BL625	BL625	BL1000
Number of stacks	4	8	25
Electrolysis capacity	2.5MW	5MW	25MW
Energy storage capacity	0.8MWh	1.6MWh	6.25MWh