
elestor
electricity storage at an unrivalled cost level

Launching a storage technology

- For stationary industrial applications
- Power range 100 kW - … MW
- Based on:
  - Flow battery technology
  - Active materials: Hydrogen & Bromine
- Boosting the energy transition
- Patented worldwide

ELESTOR'S MISSION:

Targeting the lowest possible storage costs per MWh

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Targeting the lowest storage costs per MWh

Levelised Cost of Storage (LCoS) =

$$\frac{\textbf{Total costs during the system's lifetime (€)}\ \text{(Investment + Maintenance)}}{\textbf{Total delivered energy during the system's lifetime (MWh)}\ \text{(Lifetime (cycles), Capacity (MWh), Roundtrip Efficiency (%))}}$$

Storage costs, also known as Levelised Cost of Storage or LCoS, define what it really costs to store 1 MWh of electrical energy.

- Says what it really costs to store 1 MWh of energy
- Enables objective comparison of different storage technologies
- Determines storage business case viability

FACT:

The LCoS is decisive for the impact of storage on the energy transition

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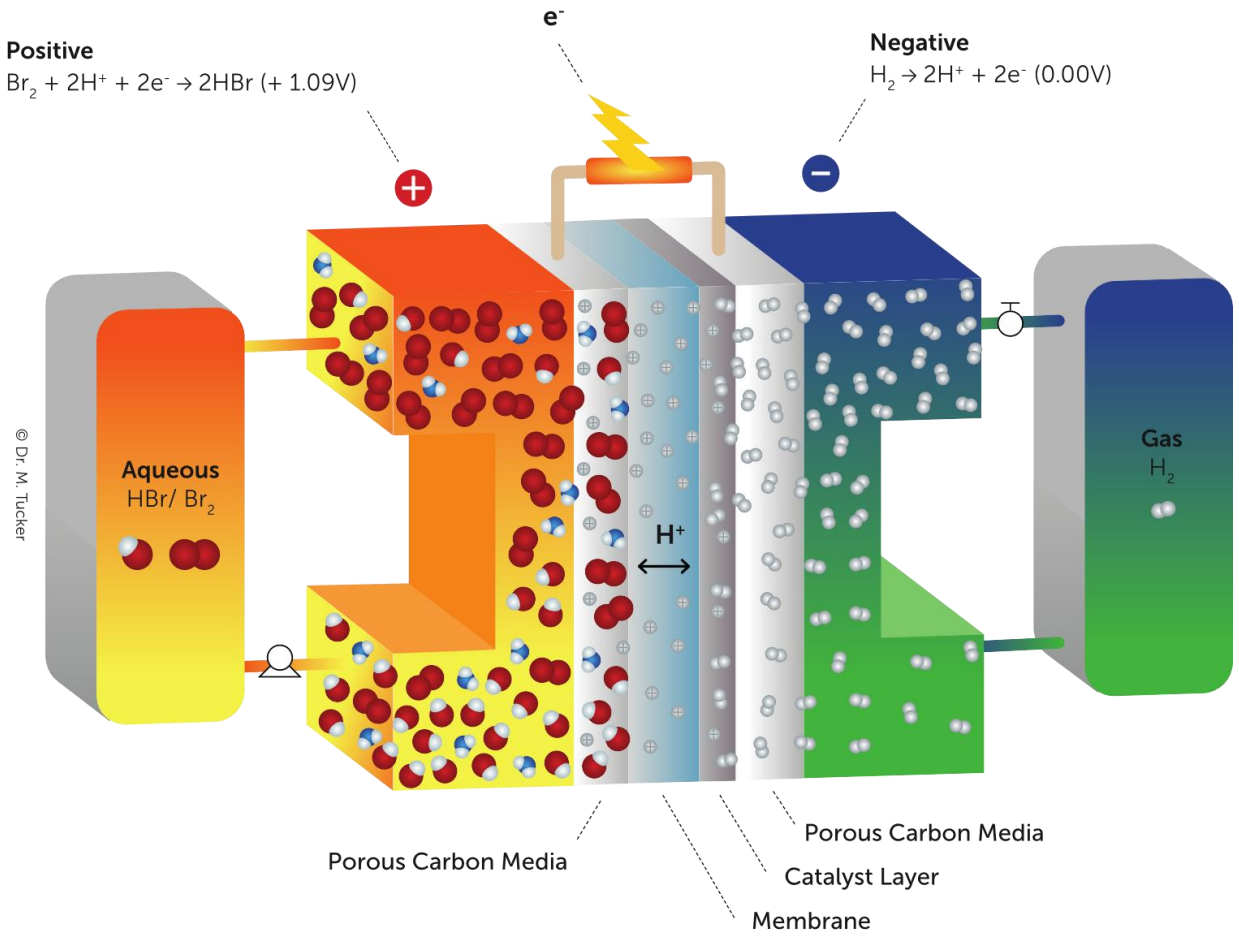
Elestor technology: Combined Electrolyser and Fuel Cell



discharge: fuel cell

$H_2 + Br_2 \rightleftharpoons 2HBr + \text{Electrical energy}$

charge: electrolyser

Power and Capacity are not coupled

- Membrane surface area → Power [MW]
- Active material volumes → Capacity [MWh]

Virtually every thinkable combination is possible

100% reversible chemical reaction

- Chemicals are used, not consumed
- No refill during lifetime necessary
- Negligible loss of capacity during lifetime

FACT:

Reduces the LCoS to
< € 50 / MWh

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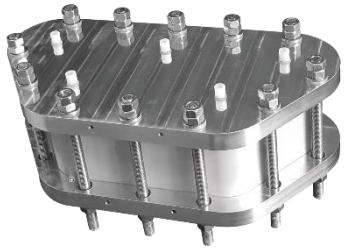
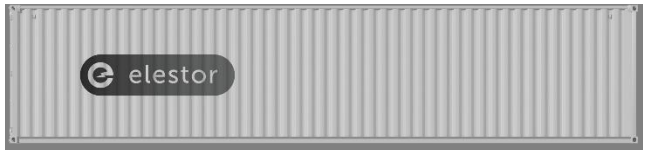
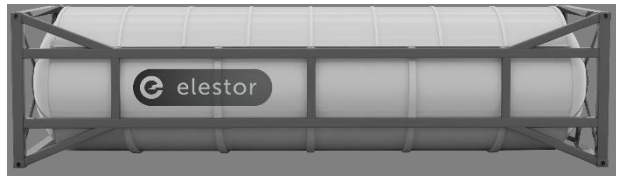
From R&D to Product



2015 2016 2017 2018 2019 2020





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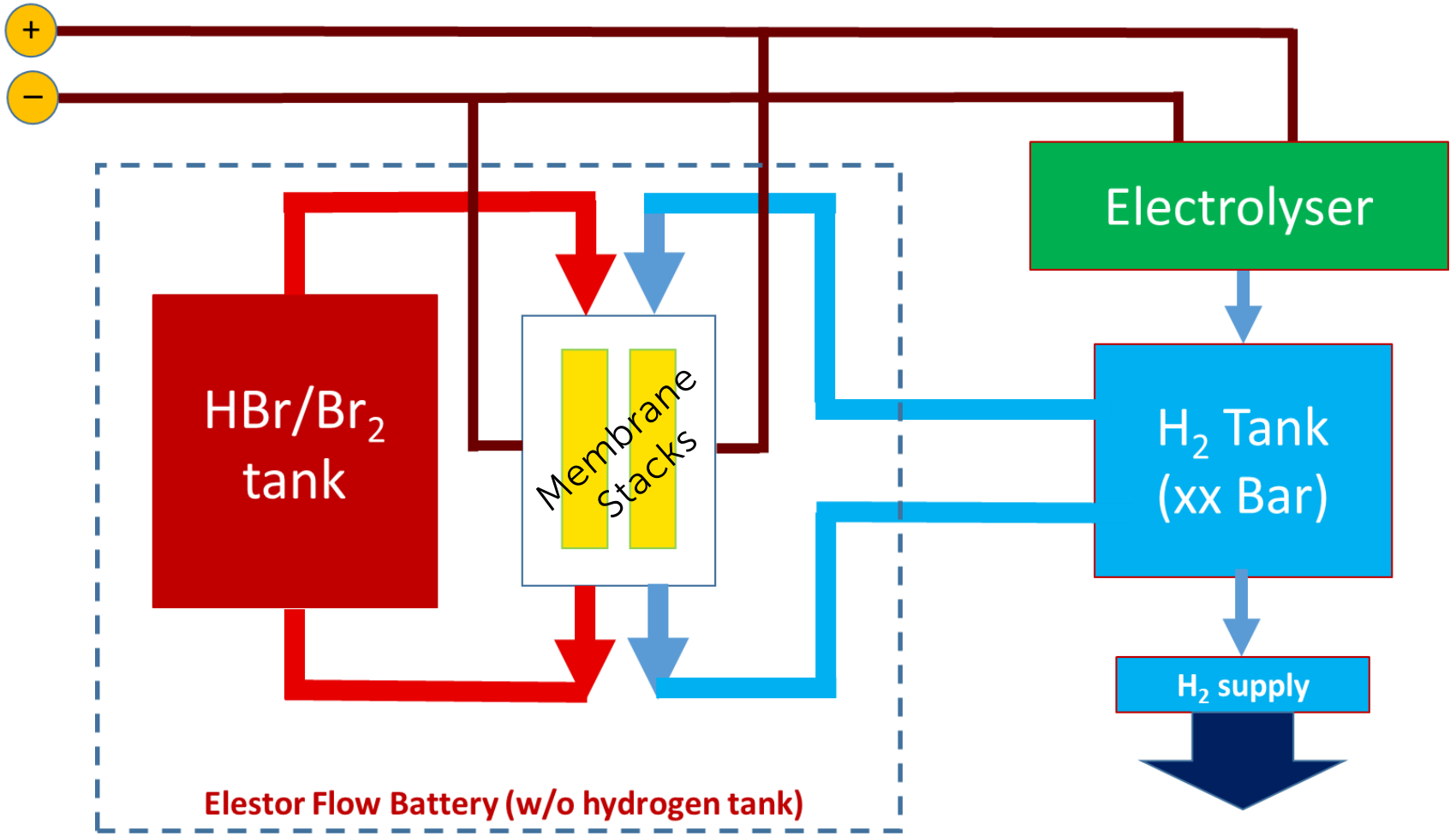
Elestor's battery forms a unique link with hydrogen production



- ✓Integrates electricity storage & hydrogen production
- ✓Optimizes electrolyser utilization
- ✓Reduces capex of the HBr flow battery
- ✓Reduces storage costs per kWh (LCoS) *further*

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About Elestor

Team

The Elestor team: Scientists & Engineers

- International team (25 FTEs) of Scientists & Engineers, combined with broad Business Development experience
- 1 PhD candidate graduated on Nov 13, 2020, at Technical University Eindhoven, department of Membrane Materials and Processes (MMP), lead by Prof.Dr. Kitty Nijmeijer.
- A second PhD candidate to promote in 2022.
- 8 different nationalities
- Member of the European 'FlowCamp' consortium, led by Fraunhofer Institute, Germany
- Deep tech know-how on: Catalysts, Electrodes, Membranes, Electrolytes, Cell stacks, Control & power electronics, System architecture, Compliancy
- > 100,000 R&D hours since June 2014

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Elestor's eco system

Research partners

Investors

Financial partners

Industrial partners

Key suppliers

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Elestor has won several prestigious awards

2015 **Challenge Cup for Best Pitch** InnoEnergy Benelux

2016 **Jan Terlouw Ambition Award 2016** Kiemt Congress
Audience Award 2016 Kiemt Congress
Sustainable Energy Startup Award SWECO

2017 **Best Technical Development within Energy Storage** IDTechEx Europe
(juried by Fraunhofer Institute, Technical University Berlin, Toyota Motors Europe)

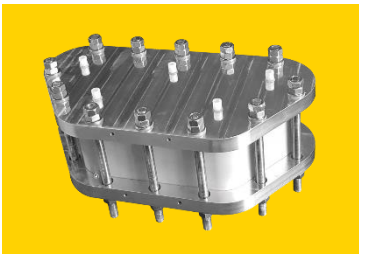
2019 **Pearl of the Region** The Economic Board

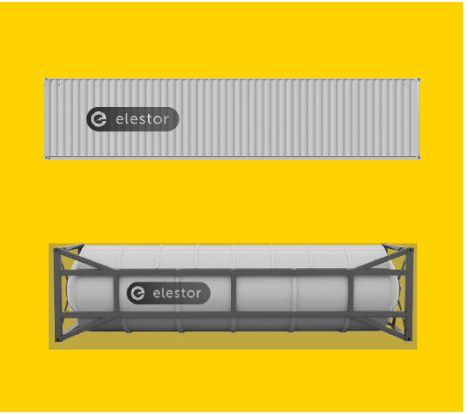
2020 **Best Poster Award** German Society for Membrane Technology

2021 **Innovation 2020 Audience Award** Chamber of Commerce

Roadmap and perspective

2019-20/21	Deploy 4 pre-production storage systems on larger scale (up to 500 kW / 2.500 kWh) - In-house production of stacks - Outsource system assembly
2021-22	Commercial launch (2 projects confirmed) - Automated stack production - Max outsource system assembly
2022-24	Construct and operate pilot plant for large scale automated stack production
2024	Construction of the first ‘Giga-factory’ equivalent for stack production





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“**We will make electricity so cheap**
that only the rich will burn candles”

Thomas A. Edison