Scalable Flow Battery Technology Enabling Multi-Day Renewable Energy Storage

Summary

Profile type
Technology offer

Company's country
Netherlands

POD reference
TONL20250905008

Profile status
PUBLISHED

Type of partnership
Commercial agreement with technical assistance

Research and development cooperation agreement

Targeted countries
• World

Contact Person
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Term of validity
5 Sep 2025

5 Sep 2026

Last update
5 Sep 2025

General Information

Short summary

A Dutch company designs hydrogen-iron flow batteries for long-duration (8–150 h) energy storage. Modular and scalable, the technology enables utilities and renewable developers to integrate variable renewables. they seek R&D, commercial, supplier, and EU consortium partners for testing, deployment, and optimization of grid-scale, resilient, and cost-effective storage systems.

Full description

A Dutch company has developed a patented and scalable redox flow battery technology designed to deliver long-duration, grid-scale electricity storage. The system is based on hydrogen-iron chemistry and is able to provide between 8 and 150 hours of storage. Its modular design decouples power and energy components, enabling straightforward scalability by adjusting electrolyte volumes.

The technology has been proven through pilot projects since 2016 and is now moving into commercial deployment. A three megawatt-hour installation is already in operation, and development is underway for a 250 megawatt-hour utility-scale system. These milestones are supported by strategic collaborations with global energy and infrastructure players, including multinational tank storage company and international energy company, and by significant growth funding from other partners.

Their flow battery is particularly relevant to energy suppliers and grid operators that need to integrate large shares of renewable electricity and manage long-duration imbalances, such as multi-day shortfalls in wind and solar generation. The technology is also well suited for transmission and distribution system operators requiring flexibility at network level, independent power producers and renewable project developers, and regional authorities focused on energy resilience.

The company is seeking partnerships across several dimensions. Utilities and project developers are invited to act as demonstration hosts and commercial adopters, integrating these systems into renewable projects and grid infrastructure. Research institutes, OEMs and technical partners are encouraged to collaborate in R&D activities, supporting testing, certification and system optimization.

Finally, they are looking to join European consortia in funded demonstration and innovation projects related to hydrogen integration, renewable storage and grid stability.

Through these cooperation models, they aim to accelerate the commercial roll-out of its long-duration energy storage systems and provide utilities and grid operators with practical, scalable tools to achieve a reliable and affordable energy transition.

Advantages and innovations

- Exceptional cost-efficiency: Utilizes abundant, low-cost materials like hydrogen, iron-sulfate. Achieves storage cost reductions of 2–3x compared to Li-ion or vanadium RFBs.

- Durability & Lifespan: Systems deliver up to 10,000 cycles and a service life of ~25 years, reducing total cost of ownership.

- Safety & Regulatory Compatibility: Non-toxic, non-volatile iron electrolyte; compliant with EU Battery Regulation and safety standards; public-sector, regulatory testing support ensures fast permitting.

- Real-world validation: Completed pilots since 2016; commercial-scale deployment initiated (3 MWh for multinational tank storage company), with expansion to 250 MWh planned. This is in partnership with this multinational tank storage company and international energy company, backed by €30 M funding.

Technical specification or expertise sought

The Dutch large battery expert is seeking partners that can contribute to the further development, demonstration and commercial roll-out of its long-duration flow battery technology. The expected roles are as follows:

Utilities, grid operators and project developers are expected to act as demonstration hosts and commercial adopters, integrating their systems into renewable energy projects and grid infrastructure.

Research institutes, OEMs and technical partners are expected to support R&D collaboration, testing, certification and optimization of system performance.

Component suppliers and subcontractors are expected to deliver specialized parts such as valves, pumps, power electronics, safety systems and hydrogen infrastructure elements that will be integrated into the company's flow battery systems.

EU consortium partners are expected to collaborate in funded projects, contributing expertise in hydrogen integration, renewable storage, large-scale system deployment and regulatory frameworks.

By fulfilling these roles, partners will directly contribute to accelerating the market readiness of long-duration energy storage and enable practical solutions for a resilient and affordable energy transition.

Stage of development

Available for demonstration

Sustainable Development goals

- **Goal 7: Affordable and Clean Energy**
- **Goal 11: Sustainable Cities and Communities**
- **Goal 13: Climate Action**

IPR Status

IPR granted

IPR Notes

Elestor has a global patent portfolio covering multiple facets of the system and continuously

IPR Notes

invests in expanding IP protection.

Partner Sought

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Type and size of the partner

- **Other**
- **SME 50 - 249**
- **Big company**

Dissemination

Technology keywords

- **04007001 - Energy management**
- **04001003 - Storage of electricity, batteries**

Market keywords

- **06003008 - Other alternative energy**
- **06008 - Energy Storage**

Targeted countries

- **World**

Sector groups involved

Media

Images

New Flow Battery for multinational Tank storage company

Yellow Inside

Videos

Elestor Munich Promo