

NaSTOR residential energy system storage prototype

Publieke samenvatting / Public summary

Aanleiding

Energy Storage – key enabler for the transition to renewable sources Low-cost stationary storage is essential for a large-scale transition to renewable energy from variable sources including solar photovoltaic and wind energy. The sheer scale of our ever-growing energy infrastructure and the stringent economic and technical requirements pertaining to stationary storage for the application of renewable integration conspire to create an urgent need for breakthrough innovation. Stationary storage solutions will need to be based on earth-abundant materials so that costs can be drastically lowered and production can continue to scale as renewable generation becomes commonplace. Batteries for renewable integration based on a highly competitive technology can contribute substantially to the economy and know how position of the Netherlands, to its industry due to the large, global market with export opportunities, and to the stability and flexibility of its electricity grid infrastructure.

Doelstelling

This project aims to deliver a 24-cell prototype NaSTOR storage system for residential energy storage with the outlook of 100 EUR/kWh costs in volume production. Such a breakthrough cost level would bring down costs of storage electricity down to a few cents per kilowatt-hour of stored electricity, resulting in payback times for households (with solar PV systems) of 5 years in EU countries, like Germany based on today's electricity and feed-in

Projectinformatie / Project information

Projectnummer / Project number
TEUE116130

Subsidiebedrag / Grant amount
€ 799.150,00

Algemene informatie / General information

Penvoerder / Secretariat
Exergy Business Development and Consultancy

Publicaties en materialen / Publications and attachments

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Eindrapport TEUE116130

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tariffs. In the Netherlands similar payback times may be realized when the current net-metering regulation for solar energy will be eliminated. A low-cost battery technology will be essential for a large-scale transition towards renewable energy sources because it can match variable renewable generation with demand load on higher levels, e.g. on local community and on utility level, as well. With distributed grid storage capacity, peaks and fluctuations on the grid can be shaved and leveled out, and investments in grid loading capacity may be deferred. Therefore, the NaSTOR development can provide a strong contribution to the Urban Energy program objectives.

Korte omschrijving

Main activities 1 R&D to scale up battery cells from 1-10 Ah to ~100 Ah cell capacity 2 R&D, design, engineering and fabrication of 24-cell prototype home battery; 3 Development of battery management and control system; 4 Evaluation and testing of the prototype battery in combination with rooftop solar in a residential setting; 5 Techno-economic analysis, incl. applicability for residential storage, reliability (aiming to be both full-proof and fool-proof); 6 Evaluation of performance and of its compliance with product standards for storage products (industry standards for grid storage applications are under development); 7 Development and engineering of first series production and assembly line

Resultaat

Key project results 1 Proof-of-technology of up-scaled cell devices: performance stability upon deep cycling, high round-trip efficiency at nominal power 2 Know how base for low temperature sodium sulfur based battery technology 3 Experience with the NaSTOR prototype battery in a residential energy storage setting 4 Design, engineering and costs analysis for first series battery production

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