

Strategic Roadmap for System Integration of Battery-based Energy Hubs

HORIZON 1

2027

HORIZON 2

2030

HORIZON 3

2032

Building trust & consensus

In this phase, workgroups of energy hub stakeholders collaboratively **define the requirements** for battery integration by sharing knowledge, aligning expectations, and **building trust** among DSOs, EMS/BMS providers, and businesses. Group-TO contracts are common and subsidies kickstart adoption.



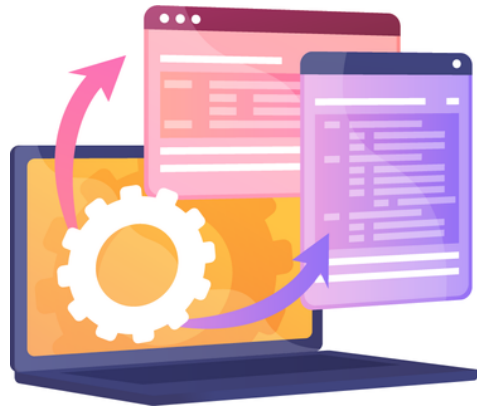
Proving the concept

Pilot projects are launched to **test new flexible types of group contracts** in combination with battery storage within EHs. Participants **refine** operational, legal, and technical capabilities, supported by advanced data management, certification of service providers, and emerging AI-based energy management.



System integration

In this phase, clear rules and **standardized** contracts are institutionalized, enabling broader adoption of battery-based EHs. Digital twins and real-time steering facilitate **system-wide coordination**, while flexible tariff structures strengthen the business case and grid reliability.



FUTURE VISION

Connecting through Battery Storage in Energy Hubs



By 2032, battery-integrated energy hubs on Dutch business parks will be established as a **proven, standardized, and scalable** solution to grid congestion. These hubs will form the backbone of a **resilient energy infrastructure**, supporting decentralized networks and energy nodes that enable local energy conversion and optimization. Ultimately, they will contribute to a **sustainable, future-proof energy system** that supports the transition toward net-zero emissions.



Target group

● Business terrains that experience long-term heavy congestion: The pioneers

● Business terrains that have evaluated EHs a viable option on the long-term

● Business terrains that want to become sustainable, more self-sufficient or switch to other energy carriers

Value drivers

Grid connection through EH

Grid reliability

Sustainability

Cost savings & additional revenue EH



Technology

Improve data measuring and management

Advanced data insight and management

Dynamic data modelling



Organization

Define standards for collaboration forms, knowledge sharing

Standardize EH organization development



Regulation

Standardization group-TO contract

Development flexible group-contracts

Standardization flexible group contracts



Finance

Kickstarting investment & reliance subsidies

Managing risk and sharing costs

Securing sustainable returns

Detailed Roadmap for system integration of Battery-based Energy Hubs

