Interreg North-West Europe STEPS

European Regional Development Fund

A market analysis by the STEPS project

Energy storage - trends and challenges in a rocketing market

Introduction

This booklet presents the key findings of the STEPS market analysis that aimed to analyse the market trends and challenges in the fast-growing energy storage (e-storage) sector, with a particular focus on battery storage.

245 GWh
batteries installed per year to 2030 [1]

The stationary battery storage market will achieve **$60bn** by 2030 [3]

The total installed cost of Li-Ion battery could fall by an additional **54-61%** by 2030 [2]

The market analysis is built upon a combination of analytical and market engagement activities. In particular, most of the insights presented in this booklet were gathered in dedicated roundtables with e-storage experts, organised in October and November 2021.

Roundtable 1

Market readiness and enabling conditions across NWE and the EU

Peter Eckerle (StoREgio)
Boris Sučić (Jožef Stefan Institute)
Paddy Phelan (3CEA)
Oliver Ingwall King (Johanneberg Science Park)

Roundtable 2

Enhancing Circularity of Battery Energy Storage

Noshin Omar (ABEE Group)
Nigel Dent (Connected Energy)
Radu Achihai (RePack)
Silvia Bodoardo (Politecnico di Torino)
Silvia Fiore (Politecnico di Torino)

Roundtable 3

Front-of-the-Meter Energy Storage

Bobby Smith (Energy Storage Ireland)
Matthew Lumsden (Connected Energy)
Paul Jordan (Energy Systems Catapult)

THE FULL REPORT CAN BE FOUND AT THE FOLLOWING LINK:
https://www.nweurope.eu/projects/project-search/steps-storage-of-energy-power-systems-in-nwe/#tab-6

Sources:

1) https://about.bnef.com/new-energy-outlook/
2) https://www.irena.org/publications/2017/Oct/Electricity-storage-and-renewables-costs-and-markets
3) https://northvolt.com/articles/energy-storage-outlook2030/

Trends and challenges

Trends in Germany

- E-storage systems are booming in private households, in combintion with. PVs. Commercial and industrial applications will follow up next
- E-storage is now recognised by all market players and decision makers as a key element for the energy transition
- Despite the availability of technologies, there is still room for innovation and improvement

Barriers in Germany

- Economic viability is still questionable in most e-storage applications
- The value of flexibility provided by e-storage is not yet reflected in regulations nor in the market remuneration mechanisms
- Regulations in Germany currently do not favour e-storage and is too complex
- Storage will always be a small part of a more complex solution that requires an increasing technical know-how
- Consumer acceptance and awareness is low

Trends in Ireland

- Battery proejcts mainly rely on revenues from Irish DS3 market, but there is the possibility to stack revenues with capacity market and energy arbitrage
- There is a trend moving from short duration to long duration storage for energy balancing
- Li-ion batteries are still the main technology, but Hydrogen is also emerging
- The majority of battery projects are funded through 100% equity mainly due to the regulatory risk associated with the system services and revenues from DS3
- There is the potential to add debt in the funding mix - moving towards longer duration storage, revenues stacking, trading price floor

Barriers in Ireland

- There is uncertainty over the procurement framework of system services
- The playing field is uneven in existing support mechanisms
- Grid connection policy implicitly disadvantage storage → connecting processes can take longer than expected
- Transmission charging regime does not incentivise flexibility
- Current market structure does not fit with e-storage
- There is a lack of policy emphasis on long-duration storage
- Local communities and citizens are against the construction of large renewable energy plant and new electricity infrastructure

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Trends and challenges

Trends in Slovenia

- Large e-storage systems are connected with energy intensive companies and provide local balancing and system services (50% secondary regulation needs)
- New instruments supporting deployment of e-stoarge will be implemented as envisioned
- Energy communities are a key element of the National Energy and Climate Plan, which will steer adoption of storage for increasing self-consumption and facilitating local balancing
- In 2023 the net metering scheme will end. The changes in the tariff system will foster implementation of e-storage systems in households and SMEs

Barriers in Slovenia

- Distributed energy resources are installed mainly at the distribution network level, creating challenges for the DNOs related to congestion and power quality
- Fossil fuels still have an important role in the supply of electricity hindering the deployment of low-carbon resources
- Value chain needs to be fully developed and particular attention should be focused on sustainability and resource efficiency
- Current tariff system and double “taxation” of storage are important barriers that are planned to be modified soon

Trends in Belgium

- Home batteries have been very popular since the beginning of 2021 (from 500 to 12000 systems), as the net metering scheme was ended for PV-owners with a digital meter. Payback times around 8 years are now possible now
- A second trigger for home batteries is expected in July 2022, when distribution tariffs will be modified and based for 80% on the monthly peak demand (kW) instead of energy (kWh)
- The business case improves for behind-the-meter Commercial & Industrial (C&I) battery systems
- The FCR and now also the AFRR markets are increasingly attractive for battery systems
- Capacity Renumeration Scheme (to compensate nuclear phase-out) will open up additional revenue streams for flexibility including storage (especially by 2025)

Barriers in Belgium

- FCR market is already overcrowded, so revenues have decreased a lot
- Double taxation makes it difficult for behind-the-meter systems to deliver FCR or AFRR services
- Uncertainty for future prices on FCR and AFRR markets create risks in investments
- The market for C&I size storage systems is not yet mature; there are still low experience rates by providers with integration and setting up systems
- The ‘hype’ of home batteries is not supported by enough trained installers, resulting in many dysfunctional systems (some expect 10-20%)

Trends in the Netherlands

- Currently, the Dutch energy supply relies on the implementation of natural gas from the northern part of the Netherlands. The Dutch energy market used to rely almost exclusively on this source of energy, however additional sources have been introduced in the mix. For environmental and safety reasons, the Dutch government plans to become independent from this source of energy and has set goals to shut down the gas production completely. This provides opportunities for renewable energy sources as well as innovative energy storage solutions
- Urgent grid congestion issues and upcoming regulatory changes on feeding energy back to the grid are growing demand for energy storage solutions, including home storage
- Smart meters installation is rolled out throughout the country. The increasing number of smart meters could enable consumers to react to real time prices, with or without aggregators, making energy consumption more efficient and opening opportunities for home storage

Barriers in the Netherlands

- Current regulations tend to hamper a rapid and large-scale rollout of e-storage solutions
- Responsibility for permits and requirements for energy storage solutions lies with municipalities, which can lead to incoherent requirements within the Netherlands. Permit complexity in the Netherlands is high. For example, there are no national guidelines for storage permits
- There is a lack of available data on (local) energy systems. This hinders the development of storage business models for local and ancillary service markets. This also causes that end-users and (small) producers to have little information on how to access the energy and ancillary service markets. The mass roll-out of smart meters currently underway should mitigate this to some extent

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Trends in United Kingdom

- Electrification and ncreasing demand need enhanced management and peak reduction > growth of flexibility needs
- UK networks are largely constraints in many regions
- UK flexibility markets are being improved and growing to address the above needs

> current flexibility markets are at national level but are being brought down to regional level to better address local flexibility needs

- In the UK, energy storage projects are led and developed mainly by commercial actors
- Visibility on real time consumption will facilitate monitoring, deployment of e-storage by enabling an better pricing of storage capacity and avoided grid demand

Barriers in United Kingdom

- Lack of knowledge of how the electricity system works and how storage should be used
- Uncertainties related to future pricing and revenue streams challenge the development of a sustainable and profitable business case
- Lack of data sharing and standardisation
- Sale processes can be unrealistic which can undermine the confidence of customers
- For a positive business case you cannot rely on the value of the electrical energy only but there should be other drivers
- Support mechanisms should be more consistent and reliable to support long-term investements

Trends in Sweden

- Swedish cities have very ambitious sustainability target including the transition to 100% electricity. Some areas such as Malmö are affected by heavy network congestion
- E-storage is growing but adoption is still low
- Visibility on real time consumption will facilitate monitoring, deployment of e- storage by enabling an better pricing of storage capacity and avoided grid demand
- In Sweden, regional energy companies are directly involved in the development of e-storage projects

Barriers in Sweden

- Lack of knowledge of how the electricity system works and how storage should be used
- Uncertainties related to future pricing and revenue streams challenge the development of a sustainable and profitable business case
- Lack of data sharing and standardisation
- Sale processes can be unrealistic which can undermine the confidence of customers
- For a positive business case you cannot rely on the value of the electrical energy only but there should be other drivers
- Support mechanisms should be more consistent and reliable to support long-term investements

Regulation and policy

Insights from the roundtable discussion by **Peter Eckerle** (StoREgio), **Boris Sucic** (Jožef Stefan Institute), **Paddy Phelan** (3CEA), **Oliver Ingwall King** (Johanneberg Science Park)

The transition to "net-zero" comes with an increasing penetration of intermittent RES resources and the electrification of transports and heating systems. Flexibility and, consequently, storage are becoming increasingly important to ensure the security of supply and to prevent and address congestion and capacity issues in both the distribution and transmission networks.

However, regulatory uncertainty related to market accessibility, permitting, and revenue stacking for e-storage is still too high in most of EU countries as regulation is still under development.

The following key aspects should be improved to support the successful deployment of e-storage and its financial viability.

REVENUE STREAMS

Reforming energy markets and creating new market mechanisms that properly recognise and remunerate the value of flexibility

Current market mechanisms were designed to operate the traditional centralised energy system and, therefore, do not properly respond to the needs of a more decentralised, renewable-based system.

Regulation should provide the framework for fully unlocking the value of storage and properly translating such flexibility value into a financial reward and incentive. Fair pricing as well as capacity payments need to be implemented in most EU countries to make e-storage business cases attractive for investors and profitable on the long-term. National ancillary services markets should be brought down at the regional level to reflect the local network conditions and source local flexibility, while offering an additional revenue stream for e-storage.

GRID FEES AND TAXES

Defining storage as a specific asset within regulation to apply proper network fees and taxes

In most EU countries e-storage is not yet defined as a new "asset" in the energy market regulation. This means e-storage is sometimes evaluated as "generator", "consumer", or both. Therefore, traditional fees related to both generation and consumption of energy are usually applied to e-storage systems which, in the worse cases, result in double taxation. Regulatory changes are ongoing in most countries to avoid such an issue, but large systems directly connected to the grid (Front-of-the-Meter) are sometimes still subjected to e.g. generation fees when they inject electricity into the grid (e.g. in Slovenia), negatively impacting the business case and the future development of new projects.

MARKET ACCESSIBILITY

Simplifying regulation to favour market accessibility and permitting processes

The e-storage business case is based on the combination of different revenue streams generated by different markets and applications that are characterised by different technical and economic requirements, fee structure, and pricing. Complexity increases exponentially every time that more value streams are stacked, requiring more knowledge, time, and resources from the project developer or e-storage owner. Permitting processes should be streamlined and conditions to access different markets made more transparent and open.

NEW SERVICES

Reflecting regulatory changes into proper services and value offering

Network operators and market players need some time to adapt their services to the new regulations. This discrepancy should be overcome by aligning decision-making processes and ensuring the technical viability of e-storage services.

Innovation potential

COST OF E-STORAGE

Reducing the cost of storage and developing new business models

Although battery storage is already economically attractive in some applications, innovation should support its economic viability more broadly and demonstrate successful business cases. This can be done by:

- **Reducing the cost of storage: investment cost is still an important barrier for many customers**
- **Enhancing revenue streams for reducing the cost of energy**
- **Innovation in business models and services can help tackle the above issues while enabling the development of solutions that are better tailored to the local conditions and encourage the deployment of storage.**

TECHNOLOGY DEVELOPMENT

Developing new technologies to meet current and future flexibility needs of a RES-based energy system

The transition to renewable energies increases the need for flexibility and system services to ensure the security of supply. Li-ion battery storage is currently the main technology adopted for the development of large scale e-storage projects. However, this technology is not able to cover all different flexibility needs in terms of duration of services, response time, ramp up / ramp down time, etc. Further innovation effort should be invested in the advancement and implementation of other technologies that better respond to the various flexibility requirements of the system, such as long-term duration storage or short-term “fast” responses. In many countries such as Ireland, most of short-term flexibility needs are currently still being met with diesel generators. Innovation should drive the development of new technologies that enable a true phase out of fossil fuels while ensuring the provision of the services needed for system stability.

SUSTAINABILITY AND CIRCULARITY

Improving sustainability and circularity of batteries and of the entire value chain

Battery storage systems are key to enabling the energy transition but, as of now, their environmental footprint throughout their lifecycle is still pretty high. There is a very large untapped innovation potential to make the entire battery value chain more sustainable and circular, from the sourcing of materials to the end-of-life treatments. Research should therefore focus on making battery energy storage a truly sustainable solution by e.g. developing new battery technologies, improving circularity of components and materials, upscaling recycling processes.

DIGITALISATION

Increasing level of digitalisation and monitoring while ensuring data protection

Designing and properly operating a battery storage system requires a certain visibility and understanding of the energy flows e.g. in a building or in the network. Current practices for monitoring are sometimes obsolete and the unavailability of data from stakeholders is a major barrier to storage deployment. Without visibility behind-the-meter, it is not possible for DNO to understand demand and allocate a proper value to the services battery storage could offer. Conversely, knowing congestion points and network status helps run storage systems to relieve pressure on the grid and provide the needed flexibility. Innovation should improve current monitoring and digitalisation practices while addressing data protection and privacy issues.

AWARENESS

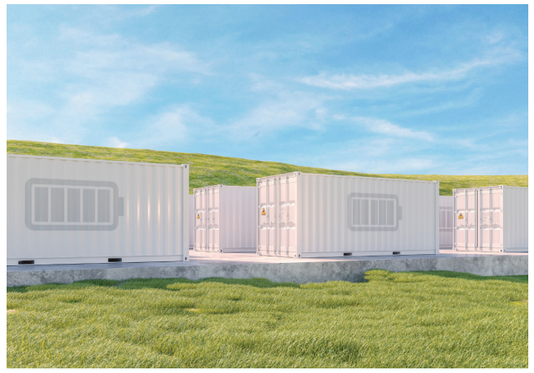
Overall the knowledge and understanding of energy systems as a whole needs to be further promoted in the society to raise awareness of low-carbon technologies and facilitate their wider adoption.

Trends

To become a global leader, Europe should and will develop a fully circular and energy efficient battery storage industry based on renewable energy. European players and R&D initiatives such as Battery 2030+ are working to make European batteries sustainable and to reduce the environmental footprint and energy demand of the entire value chain, in particular:

- **Sourcing materials locally** and increasing the use of recycled materials to cut costs and CO2 emissions
- **Applying eco-design** principles to ensure cells are designed and produced enabling low-cost recycling processes
- Developing **new battery** technologies with low or no content of critical materials that ensure high energy density and power safety
- Creating European capacity for **cells manufacturing**
- Creating European capacity **for recycling**

By using secondary materials, as well as manufacturing and recycling cells locally, the EU can reduce its dependence on extra-EU countries and its carbon footprint due to transportation and the use of unsustainable energy. This will strengthen EU’s position in the battery storage market and its competitive advantage, matching the increasing interest of consumers and industry players in sustainability and the commitment of policy makers to the European Green Deal strategy and UN Sustainability Goals.



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End-of-life solutions

The global Li-ion battery market size will achieve 1040 GWh in 2027*. This is mainly due to the exponentially growing demand for batteries for transportation, whose market share will become larger than 90%. Demand for stationary storage applications will also slightly increase, but in 2027 it will represent only 5% of the worldwide demand for batteries. These trends demonstrate that the volume of end-of-life Electric Vehicle (EV) batteries will keep increasing in the coming years and will require scalable and proven end-of-life solutions.

Repurposing and Recycling solutions and processes will play a crucial role in enhancing the circularity of the battery storage value chain. These two are not exclusive but rather complementary. Repurposing will extend the lifetime of a limited number of systems that can cover the entire demand for stationary applications. More than a third of end-of-life batteries have a remaining capacity higher than 80%, which makes them suitable to be repurposed for stationary applications (ISO 12405-1/2). However, this means that a large volume will still have to be disposed of and should therefore be recycled.

Repurposing: second-life batteries

1. CHALLENGES

Economic competitiveness
High repurposing costs and lack of financial incentives challenge competitiveness of second-life batteries. To become competitive with new batteries on a purely economic level, second-life battery cost should halve. This is challenging due to the high costs related to dismantling and testing of modules, reassembling, and integration. Lack of standardisation of EV battery modules requires tailored solutions that hinder the industrialisation of repurposing processes and increase costs.

Energy performance
Energy performance of second-life batteries is highly dependent on the quality of EVs' end-of-life modules. Effective sourcing of EVs' end-of-life modules and strict requirements on performance and safety are critical factors to mitigate risks. The lack of data on the batteries' first life operation makes it difficult for "repurposers" to assess their actual condition and health as batteries might have suffered invisible damage.

Warranty model
The allocation of liabilities and responsibilities related to second-life batteries' performance or their potential failure is complex due to the change of product "ownership" from their first- to their second-life. As the market and the technology are not yet mature, "repurposers" are currently exploring different warranty models.

2. TRENDS and OPPORTUNITIES

Economic competitiveness
Regulation should reward circularity of second-life battery products by offering financial incentives that enhance their competitiveness and accelerate the market evolution. As materials costs are currently increasing, it is likely that the cost of new batteries costs will not decrease much over the next years. This means that, if repurposing processes are upscaled and industrialised, second-life batteries can become competitive with a favourable regulatory framework.

Energy performance
Making data from the battery's first-life operation available will allow to optimisation of its future operation in its second-life and avoid performance or safety issues. Enhancing transparency on the state of health of end-of-life EV batteries through the adoption of a "battery passport" is a MUST for enabling quick assessment and decisions regarding potential repurposing or recycling and reducing risks for "repurposers".

Warranty model
Risks related to the second-life battery performance should be mitigated with a proper warranty model or by establishing a "battery passport" to improve transparency on the battery's first life. The combination of short-term warranty from OEMs with a longer specialist insurance is a proven model being already used by a number of second-life batteries providers.

Recycling

1. CHALLENGES

Material accessibility
While there are plans to build 27 cell manufacturing plants across the EU, there is still a lack of accessibility to materials and a lack of European material producers that can ensure a reliable coverage of the future demand.

Recycling capacity
The EU has a recycling capacity of about 50.000 tonnes/year mainly concentrated in few countries (Germany, France, the UK, Austria and Belgium), which is far from sufficient to process the current and future increasing volume of end-of-life batteries from the automotive and energy sectors. Nowadays, China is already able to treat 2,4 million tonnes/year and is continuously expanding its capacity.

Economic efficiency
Current recycling processes have costs that correspond to about 10-15% of the battery overall value (about 3,5€/kg). Economic efficiency is currently dependent on the recovery of high value materials such as Nickel, Cobalt and Manganese. Current and future battery generations will use a lower amount of critical materials that will reduce the overall value for recyclers and, therefore, further challenge the financial viability of the recycling processes. Most batteries produced by the word-leading manufacturers are already using LiFePO cathode, which does not have an economic value to sustain the recycling process economically.

Environmental impact
Current recycling processes have a high environmental impact that must be reduced. Technology advancement and new solutions are needed to reduce such an impact.

2. TRENDS and OPPORTUNITIES

Material accessibility
The increasing demand of Li-ion batteries over the coming years will lead to a critical increase in the demand for raw materials, particularly metals (used in cathodes), and this will consequently lead to a higher price. Secondary materials from recycling can play an important role in tackling material accessibility risks and in contributing to the development of a closed sustainable European value chain loop.

Recycling capacity
Developing local capacity for recycling will help reduce such dependency from other countries by producing locally secondary raw materials.

Economic efficiency
Solutions and technology innovation are needed to solve the recycling economic challenge related to the reduction of critical materials in batteries. In particular by 1) reducing the phases of industrial recycling process 2) exploring different recycling perspectives for low-value cathodes (e.g. direct recycling). Short loop recycling processes have a high potential to solve the above mentioned challenge and reduce the energy demand of the recycling process, but these processes need to be further advanced to reach the necessary maturity and scale.

Environmental impact
Use of locally-produced secondary materials will cut emissions coming from the transportation of materials and mining.

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Trends

Front-of-the-meter storage is a key enabler for the transition to renewable energies.

Utility-scale batteries are stationary batteries directly connected to the distribution/transmission network or power generation assets. These are defined as front-of-the-meter (FTM) as the energy they dispatch needs to pass through the households/businesses utility meters before being used. These medium-large scale batteries are mainly used to provide flexibility to the network allowing the penetration of an increasing share of RES.

Trends in Ireland

- Ireland has set a target to achieve 80% renewable energy penetration by 2030.
- Storage is key to providing the flexibility services required for the reliable and efficient operation of a system with high penetration of intermittent RES (up to 75%).
- The battery storage project pipeline comprises 2393 MW, mainly Li-ion batteries, of which 578 MW have get grid offers and 467 MW are under construction and will be operating within the next 6 months. 356 MW are already operational.
- Most of the projects under development are stand-alone systems. Hybrid projects (battery + RES) are increasing but still face some regulatory obstacles that hinder their development.
- The ancillary services market was established by the TSO in 2017 to openly procure system services from market participants. These 12 services (inertia, ramping, voltage control, etc.) are necessary to ensure system stability. This framework will end in April 2024, leading to great uncertainties regarding the next market mechanisms and payments.

Business model and revenue streams in Ireland

- The ancillary services markets (DS3 market) are the main driver for the business case of FTM e-storage projects. Few projects base their business case on energy arbitrage (merchant projects).
- The value is unevenly distributed across system services. The main value for FTM storage comes from fast-acting services such as frequency response → 2/3 of the value accessed by FTM battery comes only from 5% battery state of charge → systems are built for 30 min. duration.
- The TSO have a budget of €235M/year for DS3 services. The remuneration of DS3 services is based on this cap and the number of contracts. With the increasing number of FTM e-storage projects, the market is "overheating" with an increasing number of service providers that could lead to the reduction of tariffs, challenging the battery business case.
- The largest investment barriers are 1) the uncertainty around future DS3 revenues (after 2024) 2) permitting and connections.
- New mechanisms should reward long-duration FTM storage systems.

Trends in the UK

- The FTM storage landscape in the UK is very complex: despite the small number of developers focusing on the development of utility-scale storage systems, there are many connection requests and permitting processes ongoing to secure sites.
- This dynamic picture does not properly reflect all the uncertainties and barriers that hinder the development of FTM storage systems:
- Infrastructure investors do not have much experience with this asset and lack understanding of the business model backing FTM battery storage systems.
- Utilities are still sceptical about the longevity and resilience of the business case.
- Stakeholders (DNOs, aggregators, project developers) have different expectations about the business model and how different revenues can be stacked.
- The revenue model is characterised by a high degree of uncertainty, especially related to merchant risk. However, revenue streams are now becoming clearer and more certain thanks to favourable regulation and changes in the market mechanisms.

Business model and revenue streams in the UK

- In the past second-life batteries were seen as a liability. Over the course of the past 1-2 years this has changed, and their sustainability value is now being recognised as an opportunity.
- Connected Energy (CE) has the ambition to develop an investment-ready business model for utility-scale FTM second-life battery storage systems. This contractual model is designed to allow second-life batteries to be integrated into a system, be used for a certain period of time, and realise their maximum value before being recycled. The batteries are offered on a "service-basis" that will enable the CAPEX:OPEX ratio and the related merchant risk to be reduced.
- If investors or OEMs want to retain the ownership of the battery, CE will treat them as customers and help them with unlocking the full potential of second-life battery storage systems. The same happens if the customer is an infrastructure developer.
- The uncertainties mainly relate to the performance of second-life battery systems compared to new batteries and their ability to provide reliable services to the grid, developers, and investors. CE reduces these uncertainties by monitoring their systems and using the value of data to optimise their performance and maximise their value. The value of data is used to provide performance guarantees and to be transparent about degradation and response time so that a proper comparison with new batteries can be made.
- CE focuses on developing bankable projects with shared risks and rewards so that no actor bears a disproportional amount of risk alone or seeks to extract a disproportional amount of value.

Challenges & opportunities

The main challenges for the development and integration of front-of-meter energy storage projects across the EU are described here.

MARKET STRUCTURE and TARIFFS

The current market framework and tariffs are not designed to fit FTM e-storage systems.

Current electricity tariffs are quite flat and do not yet properly reflect the demand peaks where congestion occurs in the system. This does not incentivise flexibility nor unlock the real value of storage. Greater granularity of tariffs at node level would allow flexibility to be properly rewarded where and when needed in a particular area of the network. Nodal-level pricing incorporating carbon pricing would provide a clear "market signal" that rewards local flexibility provided by e.g. FTM e-storage, while supporting optimal system balancing and reflecting actual local marginal costs.

BUSINESS CASE RESILIENCE

Regulatory uncertainty and a rapidly changing market pose a challenge to the resilience and predictability of the FTM e-storage business case.

European policy makers and regulators are currently working on the development of a new regulatory framework to enable the energy system of the future. Changes in market mechanisms and tariffs can have a major impact on FTM e-storage's business case and its long-term viability and resilience. To mobilise investments in FTM e-storage projects, project developers and investors need to be able to predict revenue streams throughout the lifetime of the project. Currently, the risks associated with market changes are too high and there is a general lack of confidence. New risk-reward models are now emerging to overcome these uncertainties. The development of merchant projects is indeed increasing as some project developers are more willing to accept uncertainties associated with price volatility.

SYSTEM REQUIREMENTS

The development of successful FTM e-storage products and projects require clarity about future system requirements, which is currently lacking.

In most European countries there is lack of clarity from TSOs and regulators about future energy system requirements. These requirements set out the technical specifications that must be met to provide system services and, thus, access their revenue streams. E-storage products and projects should be developed to meet such requirements and capitalise market value, but lack of signals from regulators makes it difficult for product and project developers to respond and optimise the technical characteristics and configuration of their products and projects (e.g. duration, speed of charge – discharge, responding time). Therefore, there is a technology component that represents an additional risk due to the uncertainties in the market place. Changes in service requirements over the course of the project/product lifetime not only affect the value generated, but also create warranty issues that can be hardly be negotiated. For example, current FTM e-storage systems in Ireland are being designed to have a 30-minute duration as the most profitable service is frequency response. In the UK, there has already been a shift towards 1-2 hours duration system.

Making NWE energy storage innovations market-ready

STEPS will strengthen the competitiveness of NWE innovative storage providers by using a user-centric, demand-driven approach to bring products closer to market. STEPS will drive down the time energy storage SMEs typically spend on technology demonstration before reaching market maturity from an average of 5 years to 1-2, while maintaining maximum commercial usability.

STEPS AMBITION

Optimise e-storage products SMEs with support of experts

SMEs receive support from top Universities and knowledge partners in North-West Europe

Connect end-users and solution providers through real-life testing

Demonstrate innovative technologies by implementing them in a real testbed

Strengthen NWE's position as an e-storage hub

Build networks and provide policy recommendations

Accelerate the sustainable energy transition

Shape the energy sector with your innovative storage solutions that are integral to a reliable and sustainable energy system

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