i-STENTORE

innovative Energy Storage TEchnologies TOwards increased Renewables integration and Efficient Operation

D6.4

COMMUNICATION, DISSEMINATION, EXPLOITATION AND MARKET EXPLORATION, STANDARDISATION AND COMMUNITY BUILDING (1ST PROGRESS REPORT AND PLAN)

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Author(s)	Ana Luísa Alves (F6S), Maria Fonseca Monteiro (F6S), Katharina Wehrmeister (FhG), Nikolaos Bilidis (ED)
Abstract	This Report provides a detailed overview of communication, dissemination, exploitation, and market exploration activities undertaken in the project's initial 18 months. It documents achieved results, updates plans, and outlines standardisation efforts, contributing to a European technological value chain for storage. Additionally, it highlights market exploration and community building initiatives, along with clustering activities with other EC projects. Serving as a roadmap for future project activities, it guides strategic direction and ensures progress towards project objectives and impact.
Keywords	# Communication, #Dissemination, #Exploitation, #Results #Standardisation, #Community building, #Clustering activities

CONTRIBUTORS

NAME	ORGANIZATION
Ana Luisa Alves	F6S
Ioannis Mandourarakis	ED
Katharina Wehrmeister	FhG
Maria Fonseca Monteiro	F6S
Nikolaos Bilidis	ED

PEER REVIEWERS

NAME	ORGANIZATION
Nikos Bilidis	ED

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TABLE OF ABBREVIATIONS AND ACRONYMS

Abbreviation/acronym	Open form
D	Deliverable
D&C	Dissemination and Communication
EC	European Commission
ESCO	Energy Service Company
ESS	Energy Storage Systems
EU	European Union
HESS	Hybrid Energy Storage Systems
iDGM	i-STENTORE Data Governance Middleware
IDSA	Smart Grid Data Models
ISA	Standards Advisory
KPIs	Key Performance Indicators
M	Month
O&M	Operations and maintenance
OEM	Original Equipment Manufacturers
OEO	Open Energy Ontology
OM	Ontology of Units of Measure
RES	Renewable Energy Sources
SDOs	Standards Developing Organizations
T	Task
WG	Working Group
WP	Work Package

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EXECUTIVE SUMMARY

Deliverable D6.4 – Communication, Dissemination, Exploitation and Market Exploration, Standardisation and Community Building, represents a critical assessment of the i-STENTORE project's activities over its initial 18-month period. The document summarises comprehensive efforts in communication, dissemination, exploitation, market exploration, standardisation, and community building.

Throughout this first phase, i-STENTORE successfully initiated robust communication campaigns across various platforms to engage stakeholders and enhance project visibility. The project maintained momentum through workshops organisations and presentations at international conferences, ensuring ongoing dissemination of its innovative energy storage solutions. Active participation in standardisation activities further solidified the project's influence on industry standards, fostering a conducive environment for technological advancements. Lessons learned emphasized the importance of agile project management and tailored communication strategies in effectively engaging stakeholders and navigating dynamic market conditions. Reflecting on the standardisation challenges faced, i-STENTORE has prioritized adherence to grant agreement standards while adapting to evolving project needs. Extensions to existing standards in communication and data sharing have been developed to better align with project goals, positioning i-STENTORE to contribute meaningfully to future standardisation bodies' efforts.

Looking ahead, i-STENTORE is positioned to build upon its foundational achievements. The project will refine exploitation strategies, intensify market exploration efforts, and strengthen collaborations with industry partners. By advancing innovative energy storage solutions aligned with EU energy and climate goals, i-STENTORE remains committed to shaping the future of the European energy landscape through collaborative and impactful initiatives.

This deliverable not only reflects the accomplishments and challenges of the initial phase but also outlines a clear trajectory for future activities, ensuring i-STENTORE's continued contribution to the advancement of sustainable energy technologies.

As the Project progresses WP6 tasks will be continuously monitored and reported particularly under deliverables D6.5, *Communication, dissemination, exploitation and market exploration, standardisation and community building* (final report) in M36, and D6.6 *Commercialisation roadmap* in M36.

1. INTRODUCTION

Developed under Work Package (WP) 6 *Dissemination, exploitation, standardisation and impact outreach*, this document, Deliverable D6.4 – Communication, Dissemination, Exploitation and Market Exploration, Standardisation and Community Building (1st Progress Report and Plan), aims to provide a comprehensive overview of the activities undertaken in the first 18 months of the i-STENTORE project. It details the dissemination, communication, and exploitation efforts, highlights the results achieved, and presents an updated version of the respective plans. Furthermore, it outlines the standardisation initiatives and documents the progress towards establishing a European technological value chain for storage. The report also includes the clustering activities with other projects and initiatives of the European Commission (EC).

This document will be refined as the Project progresses within WP6 tasks, particularly under deliverables D6.5, *Communication, dissemination, exploitation and market exploration, standardisation and community building* (final report) in M36, and D6.6 *Commercialisation roadmap* in M36.

1.1 OVERVIEW OF THE i-STENTORE PROJECT

i-STENTORE (innovative energy Storage TEchNologies TOwards increased Renewables integration and Efficient operation) is a cutting-edge research and innovation project funded by the European Union (EU). The project focuses on advancing energy storage technologies to support the transition to a sustainable energy system in Europe. By developing innovative storage solutions, i-STENTORE aims to enhance energy efficiency, integrate renewable energy sources, and contribute to the EU's energy and climate goals. The project brings together a consortium of leading academic institutions, industry partners, and research organizations to drive technological advancements and foster collaboration across the energy storage value chain.

The i-STENTORE project will investigate the integration and combination of various storage solutions. It will feature innovative storage systems, focusing on their collaborative optimization with integrated assets, with the ultimate goals being reliability, power quality, cost efficiency, and maximizing the lifespan of these assets.

The Project team will introduce a comprehensive framework to demonstrate both standalone and hybrid storage solutions. This framework will emphasize the versatile use of storage, not just as an energy reserve but also as a proactive component of the grid, capable of delivering services and contributing to the grid's resilience, stability, and efficient functioning. The proposed framework will assess the suitability of flexible storage solutions across multiple applications, including mobility, agriculture, industry, domestic use, heating, and others. It will also consider various timeframes, generating hypothetical scenarios to determine the most effective storage solutions for each specific application, thereby advocating for the use of targeted Hybrid Energy Storage Systems (HESS).

To accomplish this and ensure smooth integration in a technology-neutral and interoperable manner, i-STENTORE will develop a reference architecture aimed at an open and adaptable storage-enabled European energy system. This system will enhance storage-induced flexibility and support the increased incorporation of renewable energy sources (RES).

i-STENTORE is also committed to pioneering new business models to create compelling and profitable business cases for storage. It aims to identify novel revenue streams for storage operators and position storage systems as key enablers in the energy transition.

This strategy will focus on developing and validating the improved connectivity of multiple systems at various levels of the energy value chain. It will include both front-of-the-meter and behind-the-meter solutions, aiming to empower new market players and strategically redefine the role of storage in the energy sector.

Following closely the activities of the Project WP6 is therefore crucial to ensure that the Project's results will be used effectively, offering benefits to stakeholders, the market, and society at large. A strategic plan provides a clear direction for the Project's future, ensuring its long-term success and impact.

1.2 SCOPE OF COMMUNICATION, DISSEMINATION, EXPLOITATION, MARKET EXPLORATION, STANDARDISATION, AND COMMUNITY BUILDING

The scope of this deliverable encompasses various strategic areas integral to the success of the i-STENTORE project. Communication involves strategies and activities designed to raise awareness about the project among a broad spectrum of stakeholders, including the general public, industry professionals, and policymakers. This is achieved through the use of diverse communication channels and tools that effectively disseminate information about the project's objectives, progress, and outcomes.

Dissemination focuses on sharing the project's results and findings with the wider scientific and technical community. This includes the publication of research papers, presentations at conferences, and active participation in workshops and seminars. The goal is to ensure that the knowledge generated by i-STENTORE reaches a broad audience, facilitating further research and innovation.

Exploitation activities are dedicated to translating the project's research and innovations into practical applications and marketable products. This involves identifying potential commercial opportunities, protecting intellectual property, and developing business strategies to deploy the technology in real-world settings. By doing so, the project aims to maximize the impact of its innovations.

Market exploration entails analysing market trends, needs, and opportunities related to energy storage technologies. It includes engaging with industry stakeholders to understand market dynamics and identify potential pathways for the commercialisation of project outcomes. This strategic analysis ensures that the project's innovations are aligned with market demands and have a clear route to market adoption.

Standardisation efforts are crucial for facilitating the adoption and integration of new energy storage technologies. i-STENTORE contributes to the development of standards and regulations by collaborating with standardisation bodies and participating in relevant working groups. These activities ensure that the project's innovations are compatible with existing frameworks and can be seamlessly integrated into the energy infrastructure.

Community building is aimed at fostering a collaborative network of stakeholders within the energy storage ecosystem. This involves forming partnerships with other projects, initiatives, and organizations to create a cohesive and supportive community. By building strong connections with other players in the field, i-STENTORE enhances its capacity for innovation and impact.

Together, these areas of focus form a comprehensive approach to advancing the objectives of the i-STENTORE project, ensuring that its innovations are effectively communicated, disseminated, and brought to market, while also contributing to the broader energy storage community and regulatory landscape.

1.3 OBJECTIVES OF THE PROGRESS REPORT AND PLAN

The primary objectives of this progress report and plan are multifaceted, aiming to provide a thorough documentation of the activities and achievements of the i-STENTORE project. Firstly, it seeks to report the results achieved in the areas of communication, dissemination, and exploitation during the first 18 months of the project. This includes detailing the outcomes and impacts of these activities, showcasing the progress made towards the project's goals.

Additionally, the report aims to provide an updated version of the communication, dissemination, exploitation, and market exploration plans. This update is based on the progress made so far and the lessons learned during the initial phase of the project, ensuring that the plans remain relevant and effective in guiding future activities.

A significant focus of the report is to outline the standardisation activities undertaken by the project. This involves detailing the contributions made towards the development of standards and regulations that facilitate the adoption and integration of new energy storage technologies. The report highlights how these efforts are helping to build a European technological value chain for energy storage.

Finally, the report documents the community building efforts, particularly the clustering activities with other EC projects and initiatives. It describes the steps taken to foster a robust and collaborative community within the energy storage sector, emphasizing the importance of these partnerships in enhancing the project's impact.

In summary, this deliverable serves as a critical milestone in the i-STENTORE project, providing a comprehensive overview of the progress made and setting the stage for future activities aimed at achieving the project's ambitious goals.

2 COMMUNICATION STRATEGIES AND ACTIVITIES

Communication strategy is a crucial part of i-STENTORE, ensuring transparency and its relevance to the right target audiences and at the right time. Activities have been taking place throughout the project's implementation and considering key moments and achievements, such as:

- Project kick-off;
- Use case/Demos updates;
- Living Lab activities and results;
- Proof of Concept (definition of the evaluation framework);
- First version of all technologies - Full Functional implementation;
- Sustainability and business impact assessment;
- Synchronisation with other projects and initiatives.

The expected outcomes are also an excellent basis for the communication strategy, as they make it possible to demonstrate the real impact of the work carried out by i-STENTORE. This strategy is essential for simplifying communication that can, sometimes, become very technical and difficult for the general public to decipher.

- **Scientific outcomes**: the demonstrators of the i-STENTORE project provide practical evidence of how ESSs can generate new value streams in unconventional applications.
- **Economic/technological outcomes**: the implementation of molten glass energy storage is a technological innovation that enables demand response in the industrial plant, with two immediate economic impacts.
- **Societal outcomes**: in general, the new functionalities and applications of the ESSs deployed in the i-STENTORE project will allow increasing the share of RES in energy systems, since all such ESSs aim to improve the performance of the electricity grid in the face of potential contingencies and stressful operating conditions.

In addition to these pillars in i-STENTORE's communication strategy, other measures will be taken to boost its reach, such as creating varied content adapted to different media, taking part in events, etc.

2.1 TARGET AUDIENCE IDENTIFICATION

Several audiences have been identified as the most relevant for i-STENTORE, and they have been the main target of the communication activities of i-STENTORE:

- Transmission and Distribution System Operators;
- OEM, Manufacturers, O&M providers;
- Energy Service Providers;

- Energy Retailers & Suppliers, ESCOs;
- Chemical companies;
- Vertical application owners (e.g. automotive, agriculture, smart cities/ municipalities, etc.);
- Energy Customers;
- Regulators.

These target audiences represent the most interested parties in what i-STENTORE is aiming to achieve, but also the general public becomes a crucial element to take into consideration, since the project is expected to have an ample impact that can affect more than the target audiences mentioned (societal impact). Also updates in the field, sector, scientific community, etc. can justify adding necessary audiences during the development of the project.

2.2 COMMUNICATION CHANNELS SELECTION

After identifying target audiences, it is important to know how to reach them, and for that, several communication channels have been chosen and used:

- **Visual Identity:** A logo was created for the project, and all visual materials have been designed to be aligned with the specific elements of the logo.
- **Alignment with the EC's visibility guidelines:** All communication materials are aligned with the EC's visibility guidelines, with the funding logo and disclaimer visible.
- **Website:** i-STENTORE's website was created to increase the project's online presence and is regularly updated with content related to the project.
- **Social media channels:** social media has become a crucial channel of communication, allowing to share all types of updates on the project and to create an online community, not only with i-STENTORE followers, but also reaching the followers of related projects and entities.
- **Events:** events have been a great opportunity to showcase the relevance and achievements of i-STENTORE. Whether in person or online, several events have been attended, such as conferences, talks, workshops, exhibitions, etc.
- **Media articles and press releases:** when relevant, the project produces articles and press releases for publications and other targeted media channels at key project milestones.
- **Newsletters:** periodic newsletters are being developed, with varied content related to the project, such as news, developments, event attendance and several other updates.
- **Marketing materials:** several materials have been produced for i-STENTORE, such as pins, lanyards, stickers, a roll-up, business cards, brochures, posters, etc.

2.3 COMMUNICATION PLAN DEVELOPMENT FOR MONTHS 1-18

TAKING INTO ACCOUNT THE STRATEGY, THE KEY MESSAGES AND CHANNELS, THE FOLLOWING

Table 1 gives the overview of the KPIs achieved so far and the goal for M36, as per grant agreement.

TABLE 1: OVERVIEW OF i-STENTORE COMMUNICATION ACHIEVED KPIs.

Description	**KPIS achieved by M18**	**contractual KPIS**
Website	1 website 10 blog posts	1 website
Social media: LinkedIn Twitter	2 social media channels 511 followers +217 posts mentioning the project	2 social media channels +500 posts mentioning the project
Brochure	2 brochure	4 brochures
Posters	6 poster 1 roll-up	5 posters
Institutional Presentation	1 presentation 1 video 1 business card	1 presentation
Trial videos	1 trial video	4 trial videos
Infographics	1 infographic	10 infographics
Banner	5 banners	2 banners
Other marketing materials	Production of pins, lanyards, stickers, inclusion on a booth design…	According to necessity
Final published report	0 reports	1 report
Articles	0 articles	5 articles
Newsletters	1 newsletter	5 newsletters
Press releases	1	2 press releases
Talks in Workshops		On invite
Innovation Events		1 event

Market uptake launch event	0	1 event

ACCORDING TO

Table 1: Overview of i-STENTORE Communication achieved KPIs. it is possible to detect some of the strengths of the communication actions so far and some that need boosting.

- Strengths: established and strong online presence; the marketing materials produced are fulfilling their objective of publicising the project; presence at events has been recurrent and could become even more so.
- To boost: media coverage needs to be intensified, creating close relationships with relevant outlets for i-STENTORE; the creation of videos and materials that reflect the results of the demos need to be produced .

Overall it can be said that the project is having a good reach and making its mark. The following images show some of the actions mentioned on the table:

BROCHURES

FIGURE 1: GENERAL BROCHURE OF THE PROJECT

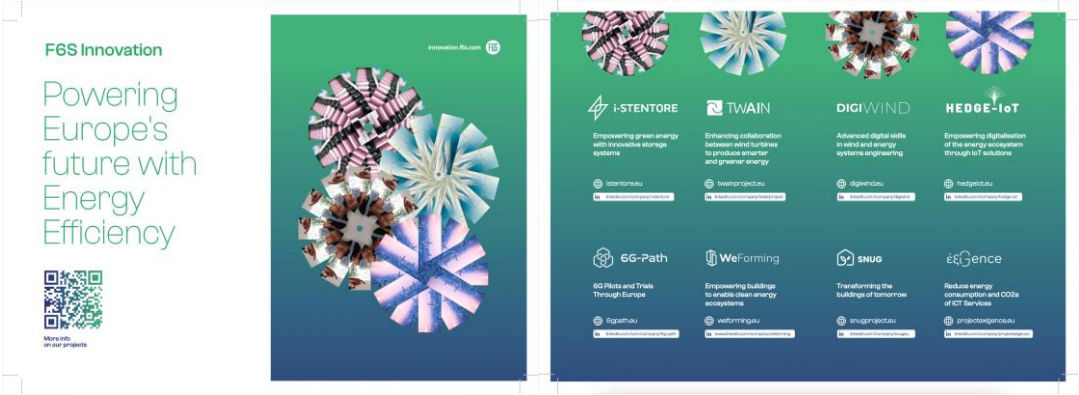

FIGURE 2: F6S BROCHURE WITH I-STENTORE

POSTERS

FIGURE 3: GENERAL POSTER OF THE PROJECT

FIGURE 4: POSTER FOR WORKSHOP - POWERING THE FUTURE: EXPLORING THE ROLE OF INNOVATIVE HYBRID ENERGY STORAGE SYSTEMS IN GREEN ENERGY EMPOWERMENT

FIGURE 5: POSTER OF THE 1ST ENERGY TALK

FIGURE 6: POSTER OF THE 2ND ENERGY TALK

FIGURE 7: POSTER FOR THE LISBON ENERGY SUMMIT

FIGURE 8: POSTER FOR THE LISBON ENERGY SUMMIT DEDICATED TO I-STENTORE

ROLL-UP

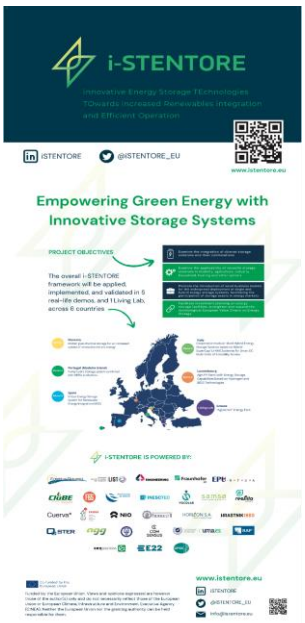

FIGURE 9: ROLL-UP OF I-STENTORE

INSTITUTIONAL PRESENTATION

FIGURE 10: SCREENSHOTS OF THE PROJECT GENERAL PRESENTATION

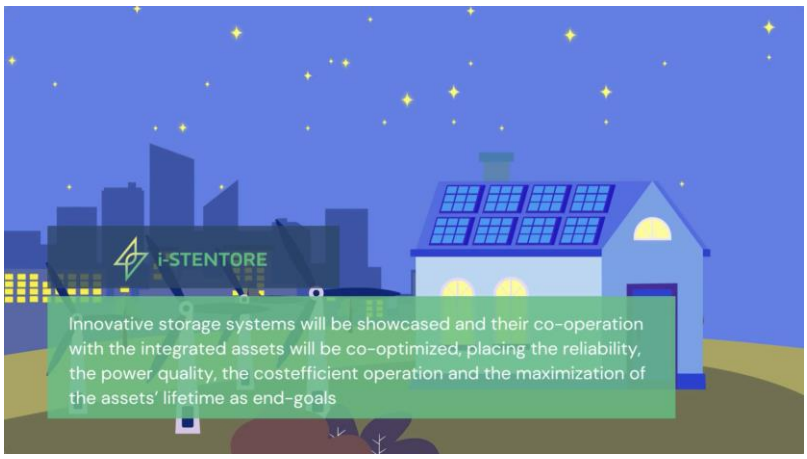

FIGURE 11: SCREENSHOT OF THE GENERAL VIDEO OF THE PROJECT

FIGURE 12: BUSINESS CARD OF THE PROJECT

INFOGRAPHIC

FIGURE 13: INFOGRAPHIC OF THE DEMOS

BANNERS

FIGURE 14: GENERAL BANNER FOR LINKEDIN

FIGURE 15: GENERAL BANNER FOR X (FORMER TWITTER)

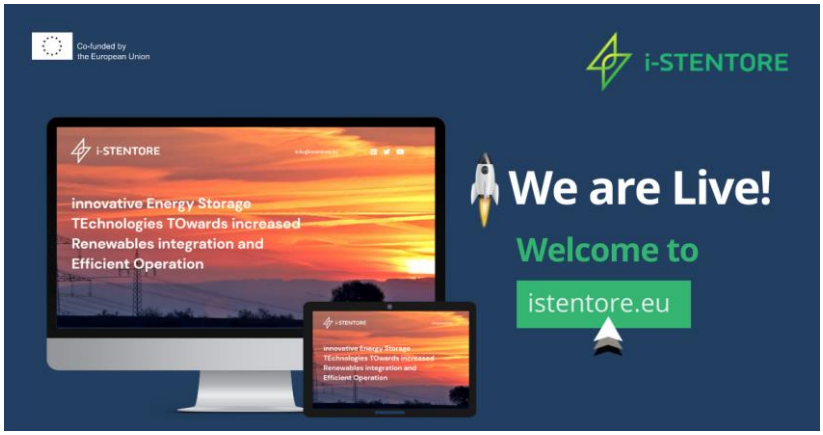

FIGURE 16: BANNER ANNOUNCING THE WEBSITE

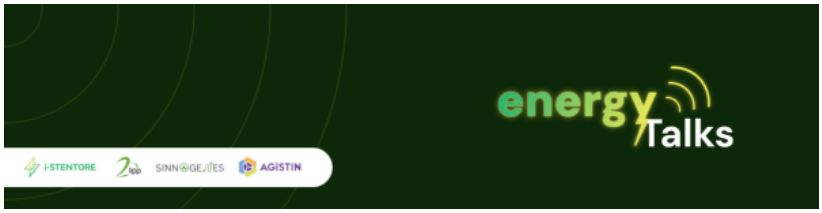

FIGURE 17: BANNER FOR THE ENERGY TALKS

FIGURE 18: BANNER FOR THE LISBON ENERGY SUMMIT

2.4 KEY MESSAGES AND BRANDING

The key messages that have guided the communication strategy are the following:

- Innovative technologies will lead to optimise processes and outputs in the sector;
- Valuable information and access to data, studies and analysis (technical and economic);
- Regulations and new models related to the energy value chain;
- Efficiency, security, resilience and sustainability of the electric supply;
- More competitive services for suppliers and for customers;
- EU synergies;
- A great step forward on behalf of Green Economy.

These messages fulfil the project's main objective of transparency, as well as maintaining its relevance in the sector and the market. They are adaptable to reality and to updates, since the energy sector is constantly changing and new developments emerge frequently. Communication needs to have the ability to adapt to this dynamic environment, combined with the ability to understand whether these messages are being well received.

2.5 ENGAGEMENT STRATEGIES

Involving target audiences in the progress of the project is essential to ensure that they remain active at all stages. It also allows target audiences to feel that they are an integral part of i-STENTORE.

To this end, in addition to targeted and engaging communication on social networks and diverse content on the website, i-STENTORE has developed targeted events. Of particular note are the Energy Talks, which have served as a more targeted and specific means of communication that takes into account the needs of the project's stakeholders, developing current topics in a conversational way and inviting stakeholders to give their input.

Regarding these Energy Talks, some numbers about engagement can already be analysed:

TABLE 2: ENERGY TALKS ENGAGEMENT RESULTS.

ENERGY TALK	THEME	REGISTERED	ATTENDED
8th May, 2024	Unlocking the potential of innovative energy storage solutions	32	23 (Zoom) 47 (LinkedIn live)
29th May, 2024	Innovative Storage Integration: Bridging The Gap Between Industrial Needs And Grid Codes	52	46

26th June, 2024	Advancing Energy Resilience: The Critical Role of Battery Storage in Modern Grids	76	52

3 DISSEMINATION PLAN AND ACTIVITIES

Dissemination is closely related to communication strategy, being key to help promote exploitation activities. In addition to ensuring that the key stakeholders for the project's exploitation and market uptake are early engaged and actively participating in the various phases of the project implementation, the dissemination activities are expected to guarantee that the advancements of the project are widely diffused to the intended targeted audiences with appropriate mechanisms in a timely manner.

3.1 DISSEMINATION OBJECTIVES

The overall goals of the dissemination strategy are to not only inform the audience about the purpose of the i-STENTORE project but also to measure the extent to which the intended audience has understood the project's messages. This approach seeks to accomplish goals related to reputation and awareness because it requires an audience evaluation.

Through a strong and consistent strategy based on accurate and reliable content and tools that allow an effective dissemination, the following goals have been the focus to reach a large audience and keep them involved in the Project's actions and results.

TABLE 3: DISSEMINATION OBJECTIVES

O1	Generate and disseminate content suitable for different target groups (content strategy and strategic disclosure).
O2	Monitor and analyse strategies and their results in order to adapt whenever necessary and obtain the best results of awareness and engagement.
O3	Develop and implement cross actions within different target groups in order to obtain valuable knowledge exchange.
O4	Listen to stakeholders and target audiences on a regular basis in order to continuously improve the global project's activities.
O5	Communicate and work with partners on a regular basis in order to provide guidance and collect inputs regarding dissemination activities.

O6	Keep improving the initial KPIs and adapt these indicators if necessary.

3.2 DISSEMINATION CHANNELS UTILISED

The dissemination channels serve as a means to achieve the right audiences and to let them know how the project can directly affect them. Table 4 shows the progress made so far on the previously defined dissemination KPIs by the grant agreement.

TABLE 4: OVERVIEW OF i-STENTORE DISSEMINATION ACHIEVED KPIs.

Description	**KPIs achieved in M18**	**Contractual KPIs**
Exhibition stands in industry innovation fairs	3 exhibition stands: • INNOGRID 2023 • ENLIT 2023 • Lisbon Energy Summit 2024	6 exhibition stands
Publication in highly ranked international journals and magazines	0 publications	11 publications
Contributions in international peer-reviewed conferences	1 contribution: • Article submission at IEEE 15th International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2024)	11 contributions
Thematic Workshops Organisation	4 workshops: • Workshop - Powering the Future: Exploring the Role of Innovative Hybrid Energy Storage Systems in Green Energy Empowerment • 3 Energy Talks	4 workshops
Cluster of European projects and other initiatives	12 connections: • Active part of the BRIDGE Initiatives and Working Groups • Collaboration with projects under the same funding call: AGISTIN,	21 connections

	SINNOGENES, 2LIPP • Cooperation with other projects related to energy efficiency: Twain; SNUG; Hedge-IoT; EXIGENCE; WeForming; 6G-PATH; DigiWind; INFERNO.	
Targeted Meetings with policy makers		7 meetings

Looking into the activities described, next are presented some of their images.

EXHIBITION STANDS IN INDUSTRY INNOVATION FAIRS

FIGURE 19: i-STENTORE AT INNOGRID 2023

FIGURE 20: i-STENTORE AT ENLIT 2023

FIGURE 21 i-STENTORE AT LISBON ENERGY SUMMIT 2024

THEMATIC WORKSHOPS ORGANISATION

FIGURE 22: WORKSHOP – POWERING THE FUTURE: EXPLORING THE ROLE OF INNOVATIVE HYBRID ENERGY STORAGE SYSTEMS IN GREEN ENERGY EMPOWERMENT

FIGURE 23: ENERGY TALK #1

FIGURE 24: ENERGY TALK #2

3.3 DISSEMINATION EVENTS AND ACTIVITIES CONDUCTED

TABLE 5: OVERVIEW OF DISSEMINATION EVENTS AND ACTIVITIES CONDUCTED.

Name of the event	Start date	End date	Country	Number of attendees
InnoGrid 2023	09/06/2023	14/06/2023	Belgium	
16th International Seminar on Furnace Design Operation & Process Simulation	20/06/2023	22/06/2023	Czech Republic	200 glass experts from 20 countries
EUSEW Workshop in Madrid	22/06/2023	22/06/2023	Spain	
Powering the Future: Exploring the Role of Innovative Hybrid Energy Storage Systems in Green Energy Empowerment	22/06/2023	22/06/2023	Spain	
87th Thessaloniki International Fair	09/09/2023	17/09/2023	Greece	123k
Enlit Europe 2023	27/11/2023	30/11/2023	France	
EnergyTalk #1	08/05/2024	08/05/2024	Online	23 (Zoom) 47 (LinkedIn)
Webinar "Perspectives on Grid Connection Networks for Energy Storage"	23/05/2024	23/05/2024	Online	46
EnergyTalk #2	29/05/2024	29/05/2024	Online	46
Lisbon Energy Summit and Exhibition	27/05/2024	29/05/2024	Portugal	more than 2000
IEEE 15th International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2024)	23/06/2024	26/06/2024	Luxembourg	
EnergyTalk #3	26/06/2024	26/06/2024	Online	
22th International Conference on Renewable Energies and Power Quality (ICREPQ'24)	26/06/2024	28/06/2024	Spain	

3.4 MONITORING AND EVALUATION OF DISSEMINATION EFFORTS

To assess whether the designed strategy is producing the desired outcomes, monitoring activities are essential. Throughout the last 18 months, monitoring has been crucial to measure and adjust the actions that are not impactful as desired. In this manner, it is guaranteed that the dissemination activities have a positive outcome and maximum impact.

The following procedures have been taking place:

- Google Analytics is being used to evaluate the website statistics and analyse the website traffic, specifically the number of page views. This measure teaches about the audience behaviour of consuming i-STENTORE information and allows to improve the content created.

- Social media statistics to learn about the types of posts and contents that generate more reach and engagement, as well as the platforms that are more effective for each target audience.
- Number of contacts on the F6S platform to measure the result of the dissemination strategy and efforts oriented for key stakeholders.
- Event participation and reach of the events.

The reporting of activities and registrations are the responsibility of all partners and have been ongoing during the Project lifetime. The reporting activities consist of the registration and analysis of all communication and dissemination activities, in order to quantify the impact produced by them. F6S is monitoring the reporting through a process established with the consortium that includes a shared spreadsheet to collect information of the D&C activities carried out by all partners.

4 EXPLOITATION AND MARKET EXPLORATION STRATEGIES AND ACTIONS

This section details the ongoing exploitation and market exploration activities that have been pursued since the project's inception and will continue throughout its duration. Tasks 6.2, 6.3, and 6.4 within the i-STENTORE project are strategically aligned to maximize the exploitation, market diffusion, and international cooperation of its innovative energy storage technologies. Task 6.2 focuses on meticulous planning of exploitation strategies and intellectual property management, crucial for navigating legal complexities and ensuring sustainable commercialization paths. Task 6.3 complements this by developing comprehensive business models that not only incentivize stakeholder engagement but also facilitate the adoption of i-STENTORE solutions through innovative financing mechanisms and strategic market entry strategies. Task 6.4 expands these efforts by fostering robust European technological value chains and international partnerships, leveraging stakeholder feedback and strategic events to amplify the project's impact across global energy markets. These tasks collectively aim to advance the i-STENTORE project's goals of innovation management, market diffusion, and international collaboration, ensuring the project's impact reaches beyond its duration.

4.1 OBJECTIVES AND INITIAL EFFORTS

The initial objectives for the exploitation and market exploration tasks were centred around identifying commercial applications for i-STENTORE's innovative grid-integrated energy storage technologies and understanding market dynamics. Despite defining a comprehensive exploitation plan and setting a clear path for market exploration, significant progress was limited during the first 18 months. The primary goal was to lay a solid foundation

for future activities, including intellectual property management, developing a strategic exploitation plan, and initiating collaboration with potential industry partners.

4.2 EXPLOITATION PLAN DEVELOPMENT AND EXECUTION

A detailed *initial business and exploitation plan* presented in D6.3 in M10 was created to outline the necessary steps for bringing the project's technologies to market. This plan included timelines, resource allocations, and specific milestones. However, the execution faced delays due to various challenges, including the complexity of aligning research outputs with industry needs. Despite these delays, the foundational elements of the plan remain strong, providing a clear roadmap for future exploitation activities.

This exploitation plan provides a structured approach to ensure that i-STENTORE's innovations are effectively introduced, adopted, and utilized in the market. Regular monitoring and evaluation of the KPIs will ensure that the project stays on track and achieves its desired impact. The table will be updated per project needs.

TABLE 6: EXPLOITATION ACTION PLAN: GOALS VS ACTION STEPS

EXPLOITATION ACTION PLAN *Objective: To maximize the impact and utilization of i-STENTORE's innovative storage solutions and integrated assets in the energy sector.*	
1. Goal: Technological Adoption and Integration	
KPIs:	1. Number of energy platforms and systems integrating i-STENTORE's storage solutions within the first year post-project. 2. Percentage increase in energy storage efficiency using i-STENTORE solutions compared to traditional methods.
Action Steps:	a. Engage with energy platform providers for integration discussions. b. Offer pilot testing for early adopters to showcase the efficiency and reliability of i-STENTORE solutions.
2. Goal: Market Penetration and Brand Recognition	
KPIs:	1. Percentage increase in inquiries and interest from potential clients and partners within six months post-project. 2. Number of mentions and features in industry publications and media.
Action Steps:	a. Launch a targeted marketing campaign highlighting the unique selling points of i-STENTORE. b. Attend industry conferences, webinars, and workshops to present i-STENTORE solutions.
3. Goal: Stakeholder Engagement and Collaboration	
KPIs:	1. Number of collaborations and partnerships formed with key stakeholders in the energy sector within the first year. 2. Feedback score from stakeholder engagement sessions and workshops.
Action Steps:	a. Organize stakeholder engagement sessions to gather feedback and understand market needs. b. Establish a stakeholder advisory board for continuous collaboration and feedback.
4. Goal: Commercialization and Revenue Generation	
KPIs:	1. Percentage increase in sales and revenue within the first year post-project. 2. Number of new contracts signed with energy providers and platform operators.

Action Steps:	a. Develop a competitive pricing strategy for i-STENTORE solutions. b. Engage with sales and distribution channels to expand market reach.
5. Goal: Continuous Innovation and Improvement	
KPIs:	1. Number of new features or improvements added to i-STENTORE solutions based on market feedback. 2. Feedback score from clients on the added features or improvements.
Action Steps:	a. Establish a dedicated R&D team to focus on continuous innovation. b. Regularly gather feedback from clients and users for improvement.
6. Goal: Environmental Impact and Sustainability	
KPIs:	1. Percentage reduction in energy wastage using i-STENTORE solutions. 2. Number of recognitions or awards received for sustainability and environmental impact.
Action Steps:	a. Highlight the environmental benefits of using i-STENTORE in all communication materials. b. Collaborate with environmental agencies and organizations to showcase i-STENTORE's contribution to sustainability.
7. Goal: Training and Knowledge Dissemination	
KPIs:	1. Number of training sessions conducted for clients and partners. 2. Feedback score from training participants
Action Steps:	a. Develop a comprehensive training program for i-STENTORE solutions. b. Offer webinars and online courses for wider reach.

5 STANDARDISATION ACTIVITIES

Task 6.5 aims to contribute to relevant Standardisation Bodies (SDOs) at the intersection of ICT and Smart Energy grids. These are split into three areas: Energy Storage, Smart Grids, and Open API. In the following, we first discern the connection between individual i-STENTORE tasks and each of the standardisation areas. Subsequently, this mapping is used to monitor the standardisation activities within the project for each area.

5.1 STANDARDIZATION AREAS AND RELEVANCE WITHIN THE PROJECT

The following sections put together how each of the Standardization Areas relate to the i-STENTORE project work, and which specific tasks and duties therefore need to be considered for contributing to them.

5.1.1 Energy Storage

The area of Energy Storage encompasses standards on technology advancement, deployment, field testing and validation, application-oriented evaluation, and more. Within i-STENTORE, the following tasks have been identified to be responsible for these developments:

- Task 3.1 Energy storage technologies advancement to fit the i-STENTORE concept;

- Task 3.2 Extension of demo specific proprietary digital platforms and tools for monitoring and controlling energy storage optimising performance;
- Task 3.3 Implementation of a Virtual Power Plant tool for energy storage system;
- Task 3.5 Implementation of flexibility services based on storage technologies;
- Task 5.4 Technological assessment of the demonstrated technologies and financial/ economic analysis towards consumer acceptance and market uptake.

5.1.2 Smart Grids

i-STENTORE standardisation regarding Smart Grids focuses on the development and promotion of a Reference Architecture supporting multi-party data exchange and full interoperability with the main existing Smart Grid standards. This is most obviously relevant for Task 2.6, but stretches through multiple WPs of the project:

- Task 2.5 Functional specifications for standardised data access and integration;
- Task 2.6 Reference Architecture tailored to an open and modular European energy system for optimised storage technologies use leading to increased flexibility;
- Task 3.4 Implementation of data governance middleware and interfaces with existing infrastructure and systems;
- Task 3.5 Implementation of flexibility services based on storage technologies;
- Task 3.7 i-STENTORE digital platform development and integration.

5.1.3 OpenAPI

Regarding OpenAPIs, i-STENTORE standardisation is specifically focused on contributing to NGSI-LD, and Context Information Management API defined by ETSI ISG. This makes the following Tasks especially relevant:

- Task 2.5 Functional specifications for standardised data access and integration;
- Task 2.6 Reference Architecture tailored to an open and modular European energy system for optimised storage technologies use leading to increased flexibility;
- Task 3.4 Implementation of data governance middleware and interfaces with existing infrastructure and systems.

5.2 STATE OF STANDARDISATION IN i-STENTORE PROJECT WORK

The following section will report on standardisation activities in the ongoing project development. This specifically focuses on the way that existing standards were adhered to and used in the first development stages of the i-STENTORE project. While this includes extensions of existing standardised aspects, contributions to the standards themselves by the i-STENTORE project will be the subject of D6.5.

Additionally, due to the unclear nature of the full set of pilots at the time of submission, standardisation actions regarding the area of Energy Storage are on hold for the time being. As a standardised approach to e.g. systems planning and performance assessment would need to cover all demonstrators equally, clear information on this can only be given when the current challenges in pilot definition have been solved.

5.2.1 Smart Grids

Task 3.4 implements the i-STENTORE Data Governance Middleware (iDGM), which forms a connecting layer between the underlying Energy Storage System and other interconnected assets and the i-STENTORE intelligent business layer.

One crucial aspect of this middleware is semantic interoperability, which is pursued through the use of and adherence to European standards and guidelines, as well as established related architectures such as IEGSA and FIWARE, and the prominent Smart Grid Data Models (IDSA). This includes the family of IEC CIM standards and ontologies.

Specifically, i-STENTORE has developed its own ontology iOntology based on standard ontologies and vocabularies available for the smart grid domain. The Interoperability Standards Advisory (ISA) has given an explicit process for developing semantic agreements. ISA promotes the establishment of common approaches and solutions to enable electronic collaboration and to contribute to the implementation of community policies and activities. The process for developing semantic agreements covers stakeholders, the specification process, methodology and implementation.

iOntology was developed in WebProtégé using OWL 2 Web Ontology Language, which is a standard for representing and reasoning with ontologies. The ISA process was adjusted according to its capabilities as well as the requirements of i-STENTORE Use Cases. The existing standard ontologies SAREF, SAREF4ENER, Open Energy Ontology (OEO) and Ontology of Units of Measure (OM) were incorporated and extended accordingly. Specifics on this can be found in D3.4, 1st technology release.

5.2.2 OpenAPI

In creating the i-STENTORE Reference Architecture, T2.6 has described the iConnector, to be developed based on the OneNet Connector, which is in turn compliant with the IDSA Connector specifications. In fact, while there are architectural alternatives to the development of the iConnector, priority is given to IDSA compliance in any case.

The FIWARE Context Broker will provide the FIWARE NGSI APIs and an associated information model (entity, attribute, metadata) as the primary interface for data sharing among i-STENTORE Participants. Data Providers will use these APIs to publish or expose their data, while Data Consumers will retrieve or subscribe to data notifications.

Regarding further details on standardised data sharing, the current state of T2.5 at time of submission can be found in D2.3, to be submitted concurrently with this deliverable.

For Identity and Access Management, the work in T3.4 decided on using Keycloak, which is an OAuth2, OpenID Connect and SAML compliant server. The focus in this area is therefore on benefitting from already standardised tools, rather than extending standards themselves.

5.3 IMPACT OF STANDARDISATION ACTIVITIES ON THE PROJECT PROGRESS

In summary, the ongoing work in the project is giving clear priority to adhering to standards defined by the Grant Agreement, and considering them in running developments.

On the one hand, there is some delay regarding standardisation in pure Energy Storage areas, due to changes in the demonstrators' setup and corresponding delays. On the other hand, standardisation is furthest along in areas relating to communication and data sharing, where standards have been implemented and in some cases extended to fit the project's goals. These extensions can be considered for contributing to the corresponding standardisation bodies in the upcoming project phases.

6 COMMUNITY BUILDING

This section focuses on the synergies and clustering activities that the project has been pursuing since its initiation. This is an ongoing action that will span the whole project duration. Through this activity the project aims to create an extensive network, acting as a collaborative ecosystem for knowledge exchange, co-creation and community building, with the aim to strengthen the European Value Chains on energy storage, renewables and digital interoperability.

Building an ecosystem of relevant projects and European initiatives is crucial for the success of the project. It fosters additional dissemination streams, facilitating the outreach to wider audiences. The project will be able to contribute with its exploitable results and generated knowledge to relevant activities of other projects and initiatives. At the same time this continuous fermentation will allow i-STENTORE to gain insights to what other projects are building and benefit from different perspectives on the same or similar topics. This creates a positive feedback loop which can more efficiently promote scientific, technological, societal and financial advancements brought by the project.

6.1 IDENTIFICATION OF RELEVANT COMMUNITIES

During the first months of the project the efforts of this workstream focused on the identification of relevant projects and initiatives in Europe that the project could target once it would enter its implementation phase. This activity led to the establishment of 2 main pillars in terms of community building:

1. Sister projects of i-STENTORE. These are the projects that answered to the same call as i-STENTORE did and were successfully funded;

2. The BRIDGE Initiative;

6.1.1 SISTER PROJECTS OF i-STENTORE

The EC has funded four projects under the same call, namely: HORIZON-CL5-2022-D3-01-11 - "Demonstration of innovative forms of storage and their successful operation and integration into innovative energy systems and grid architectures". This provides an excellent opportunity for collaboration and clustering, given the big number of projects and considering the number of partners that are involved in each one, and the expertise and value that they can add towards the main objectives of the call. Each project takes a different approach in tackling similar goals, which creates valuable space for different innovative ideas to be developed and to be brought forward towards commercialization. Knowledge exchange can prove vital in order to combine the different approaches and create a holistic framework for the advancement of energy storage and renewables and their successful, profitable and efficient integration into the European Power Systems. Table 7 below presents the Sister projects of i-STENTORE.

TABLE 7: THE SISTER PROJECTS OF i-STENTORE.

Acronym	Project Name	Short Description
AGISTIN	Advanced Grid Interfaces for innovative STorage INtegration	AGISTIN will enable industrial grid users to rapidly deploy renewables through advanced integration of innovative energy storage technologies at the interface with the grid. Rapid decarbonisation of industry through electrification, the growth of renewables, and the need for grid stability present a unique opportunity for new forms of storage and integration schemes to emerge. The main objectives in the project are to develop new forms of energy storage that meet grid needs for short-duration flexibility and stability, reduce the impact of new, large demand on the grid, and reduce costs for large grid users through innovative storage integration. This project will exceed the state of the art for aqueous batteries, use of irrigation systems as energy storage, grid interface designs and provision of advanced grid services from large load users. Two demonstrations and three test activities centred around renewable hydrogen electrolysis, irrigation pumping, and fast EV charging are used to demonstrate advanced concepts for energy storage, grid integration and grid users.
SINNOGENES	STORAGE INNOVATIONS FOR GREEN ENERGY SYSTEMS	SINNOGENES project aims to develop the Storage INNOvations (SINNO) energy toolkit, a complete framework of methodologies, tools and technologies that will enable the grid integration of innovative storage solutions beyond the state-of-the art, while demonstrating sustainability, technical performance, lifetime, non-dependency on location geographical particularities and cost. It will develop

		successful energy storage business cases and systems and deploy them in innovative and 'green' energy systems at different scales and timeframes. SINNOGENES will target the effective integration of innovative energy storage systems and value chains at the interface of renewable energies and specific demand sectors, while ensuring the compatibility of systems and standards of distributed energy storage for participation in flexibility markets. Six pilot projects will take place in Portugal, Spain, Germany, Greece and Switzerland while a detailed scalability and replicability analysis will prove the wide impact of SINNOGENES project innovations at pan European level.
2LIPP	2nd Life for Power Plants	The 2LIPP project will partially retrofit the Bornholm CHP plant with a scalable hybrid energy storage system consisting of three low-cost, storage technologies (novel molten hydroxide salt storage, lithium battery which is based on reused car batteries, and a flywheel, based on non-rare metals and with unprecedented lifetime), which all improve state-of-the art in their own way – also within sustainability. The technologies will be operated through an innovative management system (EMS) to charge and dispatch the hybrid storage system in the best way possible. The 2LIPP demonstration will serve as a proof-of-concept for a disruptive approach to transitioning traditional power and combined heat and power plants away from fossil fuels, while maintaining a secure supply of energy and stability of the electrical grid. The 2LIPP concept greatly reduces the costs of energy storage by reusing existing facilities at power plant sites. Also, the innovative combined operation of several technologies through the EMS allows for deployment of storage technologies in their relative 'sweet-spots' leading to optimal efficiencies and improves lifetimes.

6.1.2 THE BRIDGE INITIATIVE

The BRIDGE Initiative is a program supported by the EC aimed at fostering collaboration and knowledge exchange among projects funded under the Horizon 2020 and Horizon Europe frameworks in the energy sector. This initiative includes projects focusing on smart grid, energy storage, islands, and digitalization to advance the transition towards a low-carbon energy system in Europe.

Key objectives and aspects of the BRIDGE Initiative include:

- Facilitating cooperation: BRIDGE acts as a collaborative platform where projects can share experiences, best practices, and lessons learned, helping to avoid duplication of efforts and fostering synergy;

- Knowledge sharing: it aims to disseminate the results and findings of various projects to a broader audience, including policymakers, industry stakeholders, and the general public;
- Addressing cross-cutting issues: the initiative focuses on common challenges faced by energy projects, such as regulatory barriers, consumer engagement, data management, and the integration of new technologies;
- Supporting policy development: by providing insights and recommendations based on project outcomes, BRIDGE helps inform and shape European energy policies and regulations;
- Promoting innovation: it encourages the adoption of innovative solutions and technologies in the energy sector, contributing to the European Green Deal's goals of achieving climate neutrality by 2050.

Overall, the BRIDGE Initiative plays a crucial role in uniting diverse projects and stakeholders in the European energy landscape, driving forward the collective goal of a sustainable and resilient energy system.

BRIDGE operates along four main Working Groups (WGs):

- **Data Management**: this WG focuses on the handling, sharing, and protection of data within energy projects. It addresses issues related to data interoperability, data privacy, and cybersecurity to ensure that data can be effectively and securely used to enhance energy systems.
- **Regulations**: the Regulations WG examines the regulatory frameworks that impact the deployment of smart grids, energy storage, and renewable energy solutions. It aims to identify regulatory barriers and propose solutions to facilitate the integration of innovative energy technologies within the European market.
- **Customer and citizens Engagement**: This group explores strategies to involve consumers in the energy transition. It looks at ways to increase consumer awareness, participation, and trust in new energy services and technologies, ensuring that end-users are active participants in the shift towards a more sustainable energy system.
- **Business Models**: the Business Models WG investigates new and sustainable business models that can support the large-scale adoption of smart energy solutions. It focuses on identifying viable economic frameworks that can drive investment and innovation in the energy sector.

The cross-fertilization activities undertaken by BRIDGE, bringing together numerous different projects on the relevant fields described, provides an excellent opportunity for i-STENTORE to promote its activities and to not only contribute with its expertise and results to the community, but also benefit from the knowledge generated by other projects. BRIDGE can serve also as an efficient means of dissemination due to its vast network.

6.2 COMMUNITY BUILDING ACTIVITIES EXECUTED

Within the first 18 months of the project a plethora of clustering activities towards community building took place, that were either organized by the project, or where the project

participated. These activities targeted both pillars that were identified in the previous sections.

6.2.1 Activities with sister projects

During the second year of the project a close connection was established between the sister projects. i-STENTORE along with the sister projects identified potential opportunities for synergies and common activities in order to bring forward to wide audiences the activities of the projects and to highlight both common approaches and unique features that set the projects apart. The Coordinators and Communication Managers of the four projects are in close contact since February 2024 and a monthly recurrent meeting was established to allow alignment for future activities. A series of webinars, called "Energy Talks" in the form of "Web-Cafes" was proposed. This series will consist of eight webinars, each focused on a different topic. An archive of eight common topics that are relevant for all projects was proposed and each Web-cafe deals with each one respectively. Each Web-cafe is hosted by a different sister project, by taking turns, thus by the end of this workstream, each project will have organized two webinars. At the time of writing, three webinars have already taken place:

- The first Energy Talk, organized by i-STENTORE served mostly as an introduction, where all projects were briefly presented followed by a panel discussion on "Unlocking the potential of innovative energy storage solutions";
- The second one, organised by AGISTIN, revolved around "Innovative Storage integration: Bridging the gap between industrial needs and grid codes";
- The 3rd Energy Talk organised by SINNOGENES focused on "Battery storage technologies that can be utilized to ensure seamless power grid operation".

6.2.2 Activities with BRIDGE

i-STENTORE has been active in all four WGs of the BRIDGE initiative. Many partners of i-STENTORE have been long-lasting members of BRIDGE and have exploited their contacts to introduce i-STENTORE in the various activities of BRIDGE. Partners of the project, according to their expertise, have been assigned to the four WGs and are closely following the activities.

i-STENTORE has participated in several surveys conducted by the various BRIDGE WGs and has been represented by project partners in virtual and physical meetings of BRIDGE, both at WG level, but also in the annual BRIDGE General Assemblies. More specifically within the Data Management WG of BRIDGE, i-STENTORE is a contributor to the BRIDGE Data Exchange Reference Architecture (DERA). The BRIDGE Data Exchange Reference Architecture is a framework developed under the BRIDGE Initiative to facilitate the efficient and secure exchange of data among various stakeholders in the energy sector. This architecture aims to address the complexities and challenges associated with data interoperability, privacy, and security within the context of smart grids, energy storage, and other innovative energy solutions.

6.3 Future plans for enhancing community engagement

i-STENTORE will continue working towards expanding its network and its ecosystem. During the second reporting period, more results are expected to materialize, which will give the projects more opportunities to share concrete achievements and innovative solutions. Community building will become even more essential during the second half of the project and the relevant activities will be multiplied.

i-STENTORE will continue working closely with sister projects and identify more opportunities for coalitions and collaborative work. The project will strengthen its presence at the BRIDGE initiative and contribute actively in all four WGs and their respective Task Forces. Community building activities will be expanded by including more pillars, such as liaisons with standardization committees.

7 PROGRESS REPORT

7.1 SUMMARY OF ACHIEVEMENTS DURING THE FIRST 18 MONTHS

During the initial 18 months of the i-STENTORE project, significant steps were made across various domains, although some areas faced challenges that prompted strategic adjustments. The project successfully launched multiple communication campaigns, utilizing social media, newsletters, and press releases to engage a diverse audience and raise awareness about the project. Despite the lack of published research papers, dissemination efforts continued through presentations at international conferences, which helped maintain visibility for i-STENTORE's innovative energy storage solutions. Standardisation efforts included active participation in relevant working groups and collaboration with standardisation bodies, contributing to the development of industry standards. Additionally, community building activities fostered robust partnerships with other EC projects and initiatives, strengthening the collaborative network within the energy storage ecosystem.

7.2 CHALLENGES ENCOUNTERED AND MITIGATION STRATEGIES

The project encountered several challenges, particularly in the areas of dissemination and exploitation. The absence of published research papers was a significant issue, addressed by establishing a task force in M13 led by Fraunhofer to ensure systematic tracking and facilitation of publication activities. This task force aims to streamline the publication process and improve output in subsequent phases. Rapid technological advancements required continuous updates to research methodologies and project plans, mitigated by agile project management practices that allowed for flexibility and quick adaptation to new developments. Engaging diverse stakeholders with varying interests and priorities was another challenge,

addressed by developing tailored communication strategies and organizing targeted workshops and seminars.

7.3 LESSONS LEARNED FROM COMMUNICATION, DISSEMINATION, EXPLOITATION, MARKET EXPLORATION, STANDARDISATION, AND COMMUNITY BUILDING ACTIVITIES

Several valuable lessons emerged from the project's activities. A multi-channel communication strategy effectively reached a broad audience and enhanced stakeholder engagement. The absence of published research papers highlighted the need for a more structured approach to dissemination, leading to the establishment of the Fraunhofer-led task force. In terms of exploitation, the groundwork laid in intellectual property management and market analysis provided crucial insights for future efforts, even if direct progress was limited. Standardisation activities underscored the importance of active participation in working groups and collaboration with standardisation bodies to influence industry standards. Community building efforts highlighted the value of strong partnerships with other projects and initiatives, enhancing the project's overall impact and collaborative potential.

The limited progress in direct exploitation and market exploration activities during the first 18 months has provided valuable lessons. Understanding the challenges faced has allowed for a re-evaluation and strengthening of the exploitation and market exploration strategy. Moving forward, the project will focus on building stronger industry relationships, enhancing market readiness, and leveraging the solid groundwork laid in the initial phase. The team remains optimistic and committed to translating the project's innovations into marketable solutions in the upcoming phases.

7.4 ADJUSTMENTS TO THE PLAN FOR SUBSEQUENT PHASES

Based on the experiences and lessons learned during the first 18 months, several adjustments have been made to the project's plan for subsequent phases. Communication strategies will be refined to enhance stakeholder engagement, with an increased focus on interactive and digital platforms. Dissemination efforts will be intensified through the task force led by Fraunhofer, which will ensure systematic tracking and facilitation of publication activities. Exploitation activities will be reenergized with a focus on market research and industry partnerships to facilitate the commercialization of project innovations. Standardisation efforts will intensify with a more strategic approach to influencing industry standards. Community building activities will continue to strengthen partnerships with other projects and initiatives, fostering a more cohesive and supportive energy storage ecosystem.

7.5 FUTURE OUTLOOK FOR THE I-STENTORE PROJECT

Looking ahead, the i-STENTORE project is well-positioned to build on the successes of its initial phase and address the challenges encountered. The project's innovative energy

storage solutions have the potential to significantly contribute to the EU's energy and climate objectives. Future efforts will focus on advancing research and development, enhancing stakeholder engagement, and facilitating the commercialization and standardization of project innovations. With the solid groundwork laid in the initial phase and the establishment of the Fraunhofer-led task force to improve publication output, the project is prepared to accelerate its dissemination and exploitation activities and achieve significant milestones in the upcoming phases. The project will continue to foster strong partnerships within the energy storage community, ensuring a collaborative approach to addressing the sector's challenges and opportunities. With a clear roadmap and a dedicated team, i-STENTORE is poised to make a lasting impact on the European energy landscape.

8 CONCLUSIONS

The i-STENTORE project has made substantial progresses in its first 18 months, marking a critical period of exploration and development in advancing energy storage technologies. This progress report highlights both achievements and challenges encountered across communication, dissemination, exploitation, market exploration, standardisation, and community building efforts.

Throughout this initial phase, the project successfully engaged diverse stakeholders through comprehensive communication strategies, leveraging various channels to raise awareness and foster collaboration. Dissemination activities, including presentations at international forums, maintained visibility and positioned i-STENTORE at the forefront of innovative energy solutions. However, challenges such as the delayed publication of research papers prompted strategic adjustments, exemplified by the establishment of a dedicated task force to streamline future dissemination efforts.

Standardisation efforts proved pivotal in shaping the project's technological framework, emphasizing interoperability and integration within European energy systems. Active participation in standardisation bodies underscored i-STENTORE's commitment to influencing industry standards, ensuring compatibility and scalability of its innovations.

Community building emerged as a key element of the project's success, establishing robust partnerships with other European Commission initiatives and projects. These collaborations not only enriched the project's ecosystem but also amplified its potential for impactful innovation in energy storage technologies.

Despite encountering challenges in direct exploitation and market exploration, the project gleaned invaluable insights that inform refined strategies moving forward. Adjustments include intensified market research and strengthened industry partnerships, aimed at accelerating the market uptake of i-STENTORE's technological breakthroughs.

Looking ahead, the i-STENTORE project is poised to build upon its foundational achievements, guided by a strengthened roadmap and enhanced by lessons learned. With a steadfast commitment to advancing sustainable energy solutions, the project remains dedicated to contributing to the EU's energy and climate objectives. By fostering innovation, collaboration, and strategic partnerships, i-STENTORE is well-positioned to shape the future of energy storage in Europe and beyond.

In conclusion, the progress made during these initial 18 months lays a solid groundwork for future success. As the project continues to evolve, it will continue to innovate, collaborate, and drive towards a sustainable energy future, ensuring lasting benefits for stakeholders, industries, and society as a whole.

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