H2IF – Bridging Horizon 2020 to Innovation Fund

D3.1 Horizon2IF Innovation Strategy and Roadmap

Work package 3 – Technical assessments and roadmap to deployment

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Information

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Disclaimer

Abbreviations and acronyms

EV	Electric Vehicles
GHG	Greenhouse Gas
H2	Hydrogen
IF	Innovation Fund
KER	Key Exploitable Results
TRL	Technology Readiness Level
WP	Work Package

Table of Contents

Note : *Parts of the sections marked with a (*) appear in a separate document due to confidentiality*

H2IF is an EU-funded project that has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 101137734.

1. Metodology

Defining a roadmap of actions needed to bring each H2020 project on energy storage up to the Innovation Fund application level of technical and financial maturity requires the establishment of a detailed and efficient innovation strategy. In this section, the methodology used to define this innovation strategy will be presented, starting by the project selection methodology that was done at proposal phase, the organization of the interviews (kick-off meeting with all the consortium, separate technical meetings, involvement of the consultancy companies in the interviews and technical data collection, etc.) and finally, the Innovation Call presentation, as well as the supporting documentation (interview/presentation templates) created to be used in the abovementioned phases.

1.1. Project selection methodology at proposal phase

At proposal preparation phase, DOWEL, CLERENS and ZABALA have defined and implemented together the methodology for project selection, arriving to the final selection of the following promising H2020 projects for Innovation Fund proposal: **HyPSTER** (STORENGY), **HEROES** (BEYONDER) and **MELODY** (ELESTOR) which are fostering innovative hydrogen and energy storage solutions.

Taking into account that the main objective of H2IF is to coordinate the efforts and needed expertise for the preparation of proposals scaling up the H2020 projects to IF proposals, the methodology followed these steps:

1.1.1. Thematic selection

The call for proposal *HORIZON-CL5-2023-D2-01-07: Support for the deployment of R&I results for climate mitigation. Synergies with the ETS Innovation Fund* scope stated that the support of each CSA should respectively focus on the following areas:

- Low-carbon technologies in energy-intensive industries;
- Carbon capture, use and storage (CCUS);
- Renewable energy generation;
- Energy storage & hydrogen.

Based on the respective expertise of DOWEL, ZABALA, CLERENS and the European Association for Storage of Energy (EASE), the common decision was to focus on the **Energy storage & hydrogen** field.

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1.1.2. Broad scale selection

The consultancy companies have worked closely together in this 1st pre-selection phase, using CORDIS database of funding H2020 project and KAILA.

KAILA[1] is a platform that integrates more than 65 European public data sources and offers different functionalities to facilitate the management of innovation in all types of organizations. Kaila was developed by Zabala Innovation and was created as a tool for internal use to facilitate the work of the teams in the search for European projects. Over time, Zabala saw the usefulness of the tool, which in turn, led to its launch on the market, with the aim of optimising the exploitation of data that the company gathers from public information. Kaila was launched as part of Zabala Innovation's digital transformation plan (see ANNEX 1 for more details).

For the first broad pre-selection, the following filters have been applied:

- **Programme**: H2020;
- **Fields**: Heat, storage, hydrogen;
- **Type of action:** RIA and IA (CSA have been discarded at this phase).

Based on these filtering elements, a list of more than 100 project has been collected.

1.1.3. Shorten list

This shortening stage appeared to be the most critical due to the large number of projects to be scanned through this stage and the availability of the three consultancies. The methodological challenge consisted not only in the design of a methodology aiming at providing 'good candidates' for a possible IF submission, and on the definition of the ad hoc criteria, but also to its proper implementation by the three consultancies. This second constraint requested a close synchronization among the consultancies on the mode of application of the analysis to avoid any interpretation bias. Indeed the longlist of 100+ projects issued after the (b) preselection stage was distributed. Hence several filtering exercises were necessary to shorten the list.

The retained criteria were then assessed separately by each consultant for the prelected projects it has in charge, and then shared among them. Brief qualitative statements were requested to determine the potential and then rate the potential and filter out the most relevant, while keeping a back up options for some of them. Indeed, during the analysis, it

[1] Home (kaila.eu)

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was common to hesitate due to low quality of public data on the achievements: lack of precise description, missing information on the status, the TRL or the performance or on the future uses, description using generic terms requiring interpretations.

Energy storage and hydrogen	Regarding the project's topics, energy storage and hydrogen technologies related topics have been taken into account. During the 1st selection, H2IF consortium carefully ensure that all the potential technologies related to battery (Li and beyond), Hydrogen Storage and heat storage would be present in the project list.
GHG emission avoidance	The GHG emission avoidance represents the difference between the emissions that would occur in a reference scenario (without the proposed project) and the emissions resulting from the project activity over a defined period.
Degree of innovation	The degree of innovation assesses how novel and groundbreaking a project's approach or technology is.
Maturity	Maturity is assessed on various levels covering the technical, operational and financial maturity. For each level, different aspects have to be considered, for instance the Technology Readiness Level used in the project.
Scalability	Project's ability to grow, expand, or adapt effectively as demand increases or new opportunities arise.
Cost efficiency	Cost efficiency involves assessing the project's additional costs due to innovative technology adoption and ensuring alignment with emission reduction goals while optimizing financial effectiveness. In IF, applicants can request up to 60% of the relevant costs.

Out of this first large extraction, the projects have been shared among the 3 consultancies for a deeper understanding of the technology and maturity. A second filtering process was conducted based on the public abstract of each H2020 project looking in particular at:

- **Maturity**: TRL level of the technology / End TRL reached by the project (It was critical for some RIA funded projects). Projects with low end TRL were discarded at this step. That is why special preference was given to Innovation Action (IA) projects, since, in theory, they have higher TRLs.
- **Starting and ending dates**: for example projects terminated in 2023 or before were considered as too old, mostly due to the difficulty to connect to partners that are simultaneously result owners and engaged in an exploitation process. In the other

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round, projects that claim to have just started will likely lead to low technical and operational maturity considering all the steps to reach their market.

- **Focus of the project and relevance to the Innovation Fund:** Projects demonstrating clear alignment with the Innovation Fund objectives such as potential GHG emission reductions, energy efficiency, promising key technology for the EU and fostering of European competitiveness.
- **Scalability potential**: when possible, a qualitative description was proposed to project such potential based on the available public data. However, the lack of information on the exploitation intentions of the result owner makes such exercise quite tricky.

Based on this second filtering elements, a list of around 20 projects was kept as most promising.

1.1.4. Final project selection

With this list narrowed down to around 20 projects deemed most promising after the initial filtering, the consortium proceeded with the final selection phase, characterized by a meticulous assessment of each project's potential for technical innovation and alignment with the eligibility criteria, evaluation criteria and overall goal of the Innovation Fund. This phase involved a multi-dimensional evaluation process aimed at identifying projects with the highest likelihood of achieving the technical and financial maturity expected by the Innovation Fund.

One of the delicate aspects of this phase was to identify the key contacts within the pre-selected projects. Within the consortium of the selected projects the entities which were aligned with the two following aspects have been favored:

- **Financial viability**. It is a key aspect for ensure successful application to Innovation Fund as proposals are expected to demonstrate economic viability beyond the duration of the funding period. In addition, the Innovation Fund grant can cover maximum up to 60% of the relevant costs, it is imperative that applicants have the financial capacity to cover the remaining costs and that they build a strong business plan to sustain projects activities in the project lifetime. Regarding the company size, a threshold has been used, stating that no start-ups or SMEs with less than 3 years of existence can be selected. This assumption has been based on the profile of participants of the already funded

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Innovation Fund Projects, using CINEA dashboard[2] , selecting projects within sectors like “Hydrogen”, “Other energy storage” and “Renewable Heating/cooling”, of which only 1.28% of the total participants were SMEs. In addition, taking into account all the participations (not filtering the sectors), 11.06% if the total participants were SMEs.

- **Technology ownership**: Industrial players, technology owners have also been prioritized as ownership on the technology ensures that development, deployment, and commercialisation of the technology are under control.

Finally, the identified relevant entities from this shortlisted projects have been contacted by DOWEL, ZABALA and CLERENS. To facilitate and structure the process in a coherent and similar way, the consortium had collaboratively drafted a questionnaire that was sent to the contacted organizations. This questionnaire had been previously co-constructed by the consortium in a clear and concise way, to facilitate the easy understanding by the project entity and prioritise questions that directly assess the project’s alignment with the Innovation Fund objectives. The questionnaire provided clear questions to ensure correct interpretation and response formatting across the different projects contacted. This aspect has then facilitated the final decision of DOWEL, ZABALA and CLERENS. Here are some of the questions that were included in the questionnaire. The full questionnaire is attached in ANNEX II.

- *Please provide a brief description of the project (project summary). Include the project name if already available.*
- *Describe the background and rationale of the project as well as the primary objectives of the project. Describe the target market on which the project will compete.*
- *What is the project’s principal product? What will be its main application? Will there be any secondary products?*
- *What is the IPR context: in terms of ownership, co ownership and what are the exploitation intentions of the owners?*
- *Is the work towards the project implementation already started (e.g. permits application, shareholders agreements preparation)? Do you have an estimation of the timeline to reach the Entry into Operation?*

[2] Qlik Sense (europa.eu)

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After collecting the 12 completed questionnaires, DOWEL, ZABALA, and CLERENS gathered in a consortium meeting to deliberate and chose the final 3 projects which presented the most promising characteristics for Innovation Fund proposals.

The final 3 selected projects are the following:

Name	Description
HyPSTER	**STORENGY** is currently planning the second phase of the HyPSTER (Hydrogen Pilot Storage for large Ecosystem Replication) project on its natural gas storage site in Etrez. The HyPSTER demonstration project was awarded a 5 M€ grant from the Clean Hydrogen Partnership in 2020 and will end in December 2023, once 100 hydrogen storage cycles have been performed in the EZ53 salt cavern. Storengy's aim through this second phase of the project is to launch the first commercial operations of underground hydrogen storage in France by 2026. To reach that milestone, Storengy will perform the necessary engineering studies, permitting studies and construction works to connect a 1 MW electrolyser to the EZ53 salt cavern. With a 44-ton hydrogen storage capacity, this asset will ensure the security of supply for hydrogen ecosystems in the Auvergne Rhône Alpes region. *Category: Hydrogen Storage*
HEROES	**BEYONDER** is currently seeking the next phase of the outcomes of the HEROES (Hybrid Energy Storage Station) H2020 project that will be finalized August 2024. The project is developing a hybrid fast-charging station for charging multiple cars simultaneously. HEROES project is a research and development project (TRL4-TRL6/7). This project submitted under the IF will be a continuation of the HEROES project using the results and experience from HEROES for development of the hybrid solution to TRL8 together with industrial partners. *Category: Energy Storage*
MELODY	A 4 M€ grant in 2020 was awarded to demonstrate a low-cost, high efficiency redox flow battery system, using the hydrogen and bromine redox couple. The project ends in March 2024, but lead industrial partner **ELESTOR** already started developing the technology to multi-MW scale. The project output is scientifically sound, with 6 publications to date, and the analysis by project partner Fraunhofer ICT validated the recyclability and GHG emissions reduction potential. Since the flow battery uses hydrogen as one of the active materials, it can be connected to a hydrogen pipeline/underground cavern system for improved safety and further reduction of investment costs and footprint. *Category: Energy Storage*

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1.2. Methodology for the interviews

Within the framework of WP3 activities, H2IF consultancy companies have proceeded to the analysis of the HypSTER, HEROS and MELODY selected H2020 projects considering in more details: *(a)* scope, *(b)* technical maturity of the product, *(c)* business model of the project and *(d)* funding needed. This analysis is being conducted with the corresponding projects on one side and with the consultancy companies on the other side. The following methodology have been designed by DOWEL, ZABALA and CLERENS in this first phase where the **objective is to define together the actions needed to bring the projects to the IF application requested level and to understand when the application will be submitted to the Innovation Fund in order to elaborate a roadmap for each project application**.

The three consultancies of the consortium (DOWEL, ZABALA and CLERENS) have agreed on the following structure and organization of the interview:

1.2.1. Template co-creation and interview structuration

In order to facilitate and structure the discussion and to ensure comprehensive coverage of essential points during the interviews, DOWEL, ZABALA and CLERENS collaborated to develop a structured support template. This template served as a guiding document for both interviewers and projects, facilitating the focus of the dialogue and alignment with the evaluation criteria of the Innovation Fund.

This support template was sent to each project one week before the 1st interview. Similarly to the questionnaire that was send to the shortlisted projects, the support for interview template has been structured following the different evaluation criteria of the Innovation Fund, this time going more in depth on the different aspects. The questions from the support document are reflected below in table 1:

INNOVATION
- *Please describe the technology in detail and provide as much data and information as possible.* - *What is the current commercial state of the art?* - *How is the technology project going beyond?*
TECHNICAL MATURITY
- *What is the current TRL of the technology?* - *At which scale have you validated the technology?* - *Are suppliers needed?* - *Can you detail the relationship (binding agreement like terms of supply/ offtake that you have with project technology suppliers and commercial offtakers?*

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OPERATIONAL MATURITY
- *What is the internal timeline of the company concerning the project development?* - *Can you describe the selected site for the implementation of the project?* - *Do you already know which permits will be needed for the project implementation?* - *Have you identified who are the key stakeholders needed to ensure the success of the project implementation?*
FINANCIAL MATURITY
- *Do you have an estimation of the global project costs?* - *What about expected CAPEX?* - *Have you identified sources of revenues?* - *Do you have a preliminary business plan/ financing plan? (% of debt and equity involved in the project or corporate practices)* - *Is there an internal IRR goal?*
GHG EMISSIONS AVOIDANCE
- *How is the solution contributing to avoid GHG emissions?* - *Are you able to estimate Total capacity of energy stored/ supplied per year by the project?*
POTENTIAL FOR REPLICABILITY
- *Have you foreseen other sites where technology could be replicate?* - *Have you foreseen to extend the capacity of the storage site in the long term?*

Table 1 : Questions reflected in the support template for interviews

For each interview, a pair of two consultancy partners was proposed allowing to leverage on complementary expertise and perspectives and enriching the interview process. This collaborative approach ensured that interviews were conducted with a diverse range of considerations, avoiding any points to be left aside. By mixing and matching the consultancy teams along the 3 interviews, it allowed a more dynamic exchanges of ideas and critics. For Storengy and Elestor, is has been decided to conduct the 1st interview in person to allow for a deeper understanding of the projects and allow the consultancy companies to meet with the project responsibles. The decision to conduct the third interview online was driven by practical consideration of geographical constraints and timing. For this last interview, the 3 consultancies companies connected online, ensuring that the evaluation process remained on track.

1.2.2. Individual interviews

For all the three 1st interviews, the following agenda was adopted (3h meeting in total).

5min	Participants arriving
1h	Presentation of the selected projects and the internal strategy + visit of site when relevant

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	Innovation Fund - General presentation - Overview on the key award criteria

1h45	In-depth discussion (All)
	• Innovation
	• Maturity
	  ○ Technical
	  ○ Operational
	  ○ Financial
	• GHG emission avoidance
	• Potential for replicability

5 min	Wrap up and next actions

During the interview process, it was important for the consultancy companies to get insights on the internal strategies of each company regarding the project/technology deployment and future internal objectives. This allowed DOWEL, ZABALA and CLERENS to get an in-**depth picture of the market positioning, growth targets and long-term sustainability strategies** of STORENGY, BEYONDER and ELESTOR.

This methodology ensured that all relevant aspects were systematically addressed, enabling DOWEL, ZABALA, and CLERENS to make the key decisions regarding the identification of the necessary actions required for each project to go towards a successful Innovation Fund proposal. Additionally, it helped the consultancy companies to determinate and advise projects on the optimal timing for Innovation Fund submission ensure that the entities' internal strategies are aligned with the project milestones and Innovation Fund criteria and successful IF project expectations.

Following the initial round of interviews, the consultancies continued to engage further with the projects and deepened their understanding through iterative discussions and bilateral exchanges. One of the project promoters has put forward two distinct projects ideas for potential consideration under the Innovation Fund. It was therefore important to already take into account the specific criteria of the IF and to determine the most suitable project or combination that would address the best the Innovation Fund criteria and goals. This action is still ongoing and will be further developed in the confidential part of the deliverable.

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2. Synthetic outcomes of the interviews*

Due to its confidentiality as on projects related information, this section is further drafted in a separate document. The short summary below for each project promoter is based on public information.

2.1. Storengy

Storengy is a leading natural gas storage company, part of ENGIE Group, which offers global solutions for decarbonized networks in order to support green gas market worldwide. Storengy plays a key role in ensuring the reliability and security of energy supply across various value chains and markets in Europe.

On the principal activities of the company is the management of underground storage facility which are crucial assets in balancing supply and demand fluctuations in the natural gas market. These facilities store important quantities of natural gas during periods of low demand and release it when demand arises, thereby ensuring a steady and reliable supply for consumers and industries.

With the will to the decarbonise Europe and its industries, Storengy aims to contribute to the EU Green Deal objectives and is turning towards more sustainable energy alternatives. In this context, hydrogen has emerged as a key focus for the company, Hydrogen as a important potential as a clean and renewable energy carrier. By leveraging their expertise in underground storage and optimisng their infrastructure for hydrogen, Storengy is willing to play a key role in facilitating the transition towards a more hydrogen based economy. By investing in hydrogen storage technologies and infrastructures, Storengy is positioning itself as a key enabler of the energy transition, driving the development and deployment of clean energy solutions.

In this context, Storengy strategy towards hydrogen is illustrated in an important number of H2 projects in the pipeline and under deployment. For instance, among others, here are some of Storengy hydrogen project under operation:

- **HyPSTER**: In the region of Auvergne Rhône Alpes, Storengy and its partners develop the **first demonstrator of large-scale green hydrogen storage**. This project is going to use a salt cavern of the Storengy storage site in Etrez to connect electrolysis production to industrial and mobility applications. The salt cavern used has a storage capacity of 44 tons of hydrogen, which is the equivalent of 1760 hydrogen bus tanks.

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This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership).

- **SaltHy – Storage Alignment with Load and Transport of Hydrogen**: This is a lighthouse project in northern Germany on an industrial scale, in which green hydrogen regionally produced from wind turbines and photovoltaic systems is set to be stored in underground salt caverns at the Harsefeld gas storage facility. For this purpose, one or two new caverns will be added to the storage facility. And from 2030 onwards, approximately 30 to 100 million standard cubic metres of pure hydrogen will be stored in these caverns.

- **Hydrogen storage project at Manosque**: The Géométhane storage site at Manosque, operated by Storengy, has 9 salt caverns, including 7 natural gas caverns. In addition to the 7 caverns in operation, there are two caverns available that are technically and administratively suitable for storing hydrogen. The Manosque salt caverns represent a strategic asset in this respect since they will enable around 6,000 tonnes of hydrogen to be stored.

Storengy foresees a future where all its storage facilities will be dedicated to renewable gases, such as hydrogen and biomethane. Although currently storing only a small portion of biogas, approx. 5%, Storengy aims to fully transition towards renewable gases by 2050. The company commitment aligns with EU global efforts toward decarbonization, energy independence, and guarantee a secure and stable energy supply.

2.2. Elestor

Elestor envisions a future powered by clean and sustainable energy, where large-scale, long-duration, and affordable energy storage systems become the cornerstone of a new energy infrastructure. These bi-directional power plants will replace traditional coal, gas, and oil-fired plants, harnessing the power of renewable energy sources like solar and wind.

The benefits of renewables, coupled with efficient energy storage, extend far beyond simply providing affordable electricity to homes, businesses, and transportation. This future energy system fosters cleaner air in urban centers, promotes stable global temperatures that mitigate the impact of natural disasters, and ignites economic prosperity through the

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creation of green jobs within the energy sector and its associated industries. This transition marks a crucial point where environmental well-being, human needs, and business profitability converge.

Elestor's mission is to drive down the cost of electricity storage to its absolute minimum, paving the way for a clean energy revolution. This journey requires collaboration with diverse stakeholders – from fellow renewable energy players and committed investors to local, national, and international policymakers.

The foundation of this new energy system rests on three pillars:

- Renewable Energy Generation: Harnessing the power of the sun and wind to generate clean electricity.
- Large-Scale Energy Storage: Building long-duration, low-cost storage systems to ensure a reliable energy supply even during periods of low sun and wind.
- Smart Infrastructure: Developing sophisticated micro-grids, electricity grids, and hydrogen pipeline networks to efficiently distribute clean electricity where and when it's needed.

Elestor is dedicated to playing a pivotal role in building this new energy landscape, one that prioritizes the health of our planet, empowers people, and fuels sustainable economic growth.

2.3. Beyonder

Beyonder is a pioneering technology company located in Norway. Beyonder activities focus on research and development of advanced battery cell technologies and targets industries that demand high power solutions.

At Beyonder, one of the core activities is on the creationg of high-power and more sustainable energy storage systems. With its high qualified and strong expertised research and development activities, Beyonder is working on the lastest advancement of battery technology aiming to deliver viable solutions that would meet the need of various industrial sectors from automotive to industrial.

As part of its commitment to advancing sustainable energy solutions, Beyonder is actively involved in the HEROES projects which will be completed in August this year. The project aims to revolutionise electric vehicle charging infrastructure by introducing a hybrid fast-charging station capable of accommodating multiple vehicles in the same time. The project

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proposes a solution to some of the barriers for the wide adoptions of Electric vehicles (EV), in particular to the lack of a well distributed infrastructure for fast and widespread charging. As EV are expected to play a key role towards a decarbonised transport system and thus contribute to meet EU's ambitious goal to reduce GHG emissions, it is crucial to counter the current barrier for their deployment.

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3. Roadmaps towards the application to the Innovation Fund*

For the same reason of confidentiality, the content of the roadmaps will not be shared via this public deliverable.

The roadmaps towards the application to the Innovation Fund will be an important tool for H2IF project, allowing a simplified visualisation of the timeline, crucial deadlines and activities to come. The roadmap towards applications are included in the non-public deliverable and, as illustrated in Figure 1 below, the roadmap will provide information on actions already identified that projects will need to implement, a recommended timing for IF application based on the gap between current situation and IF expectations, and the related justifications for this decision.

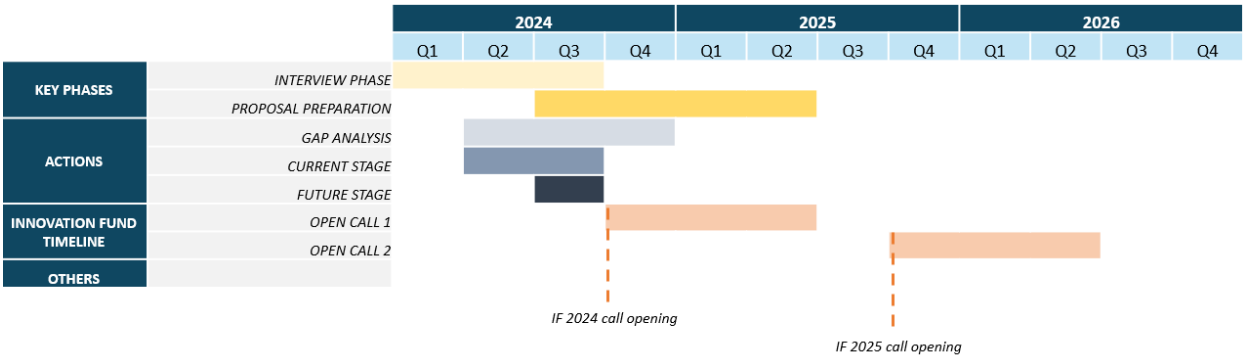

Figure 1: Example of a detailed project roadmap
(timeline for IF calls stays provisional until official publication)

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4. Conclusions

4.1. First return on experience on the methodology implementation and common ground of the methodologies used in other sister projects.

In late April, a cluster event gathering the beneficiaires of the 5 Coordination and Support Actions (CSA) funded under the same topic was organized by CINEA and the DGs responsibles of the topic (DG CLIMA and DG RTD). During the 2-days workshop, a specific session focused on the methodology process for the selection of promising H2020 funded project which could be submitted under the Innovation Fund Programme. It was clear that the CSA aimed at the same key objective, although specifically for the different sectors in which they are involved, of bringing promising H2020-funded projects to good and hopefully successful Innovation Fund applications, and followed the same road of activities for what concern the methodology of the project selection process.

The session underscored the following observation: Despite the differences due to sector-specific aspects, a **common ground with similar steps** have been followed by all. It is quite clear that while these shared methodologies provide a solid framework and a strong knowledge basis for future project selection, specific refinement and filtering are necessary to reflect the specificities of each sectors. For what concerns the common grounds, all CSAs are applying more or less the same criteria in their filtering methodology (overall fit with IF, project promoter profile, innovation, GHG emission avoidance potential, TRL and maturity). On the other hand, one key notable specificity is reflected in the number of H2020 funded projects in each sector. For instance, for what concerns renewable energy projects, there are a tremendous amount of them, whereas, for CCUS related projects, as technologies and policy supports are quite new, there are less funded projects.

As a first return of experience of H2IF selection methodology which was done during the proposal preparation phase, it became apparent that the process of filtering projects was time-consuming and demanding for DOWEL, ZABALA and CLERENS. Moreover, the level of feedback received during the questionnaire phase was lower than expected. Upon closer discussion with the other CSAs, it was commonly shared that this barrier could also come from a lack of knowledge and understanding of the Innovation Fund programme among project promoters. To counter this challenge, the majority of the CSAs have spread the word

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within their own network and have also worked closely with European Association to identify the most promising project, project promoter and to ease the contact with them, highlighting the crucial role of European associaitions.

Another blocking point during the filtering and project selection process related to the fact that public information (abstract mainly) was insufficient to feed the project qualification and selection process. In response to this challenge, one of the CSAs proactively explored additional information sources going beyond than CORDIS, and deep dived into public deliverables and publications that could be found in the projects websites for instance. While this required an additional time investment, it also allowed the consortium to access deeper insights on the technology aspects, possibly including maturity or market readiness level, etc, which are all important criteria for the Innovation Fund.

Finally, it's worth adding that while there are **many H2020 projects** and a strong potential for scaling up innovative technologies for climate neutrality (referring to the report mapping the EU demonstration projects in energy intensive industries published by DG RTD in May 2023[3]), **only a reduced number are well-aligned with the IF criteria**. One significant challenge is that H2020 proejcts often produce multiple Key Exploitable Results (KER), but the IF focues on selecting projects based on one significant KER that meets specific criteria. This lack of explicit alignment between projects and KERs can potentially create a barrier to a correct selection.

At project stage, when starting the interview phase, one of the first hurdles encountered was that the initial level of understanding by industrial partners of the IF objectives and requirements was limited. In addition, we have faced some challenges to get information on strategical aspects of the companies such as preliminary business model associated to the project, alignment between project and overall firm's strategy, financial solidity of the company - which directly impacts the feasibility of an IF application.

Finally, we faced difficulties in synchroning the schedule of the IF calls with the timeline constraints of the companies. The timing of the IF calls and the H2IF timeframe being distributed over two years of calls, was not necessary aligned with the companies' operational and strategic timelines. Careful coordination is needed to ensure that efforts will be appropriately distributed over the duration of the calls.

[3] Scaling up innovative technologies for climate neutrality - Publications Office of the EU (europa.eu)

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4.2. Preliminary recommendations for replication of the proposed selection and qualification process

Based on H2IF and other CSAs' experiences shared during the cluster event, H2IF consortium is willing to provide some thoughts and preliminary recommendations for replicating the proposed selection and qualification process for furtur uses.

- **Require Public summary of Final exploitation plan**: It could be beneficial to make it mandatory for some projects (mainly Innovation Actions) to publish a public summary of their final exploitation plan, on platforms like CORDIS for instance. Alternatively, when not possible, the TRL achieved at the end of the project should be clear as it gives valuable information about the project's positioning towards deployment, and potential for comercialisation.
- **Tranparency of the Technology Ownership**: It could be interesting to consider the implementation of measures to ensure transparency on the IP, rights and ownerships of the innovative technologies developed in funded projects. This could facilitate collaboration and knowledge sharing among stakeholders and project partners.
- **Include in the call text of relevant topics (mainly Innovation Action) mandatory activities about continuity:** This will encourage projects to ensure that there are specific tasks/subtasks dedicated to support the continuity of the project results beyond the grant period. This could be explicitly mentioned in the call (as it is already for few topics), with references to Innovation Fund programme or other relevant EU funding opportunities (LIFE, CEF…) to raise awareness about the need for a longer-term impacts.

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Annex I – Kaila

As mentioned, KAILA is a **platform that integrates more than 65 European public data sources** and offers different functionalities to facilitate the management of innovation in all types of organisations.

In addition to the identification of opportunities and partners, **Kaila enables the analysis of innovation trends and helps users perform competitive and technological surveillance.** It provides users access to 170,000 innovators, 100,000 projects and 14,000 funding opportunities. The platform's various functionalities and a powerful graphical interface for data visualisation have become a springboard for boosting innovation processes in all types of organisations.

Kaila has two modules that complement each other perfectly:
[i] The first, "**Analytics**," is a search engine that integrates more than 65 European Open Data sources and embeds them in a single environment.
[ii] The second module was launched in November 2021: **Kaila Wise**. This is a recommendation engine that expands the user's knowledge and offers suggestions based on a sophisticated algorithm. This "smart" engine helps the user discover new funding opportunities, projects and innovators, based on their specific interests.

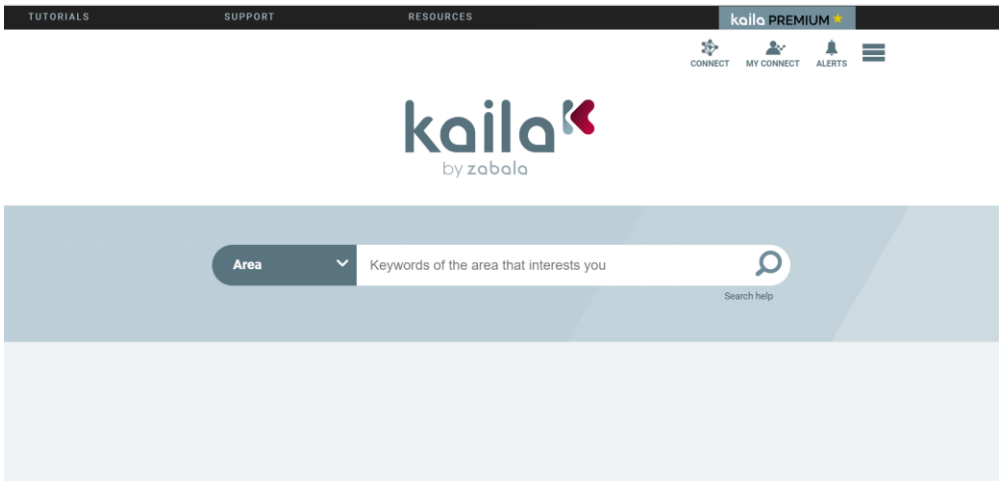

Figure 2: KAILA Welcome page

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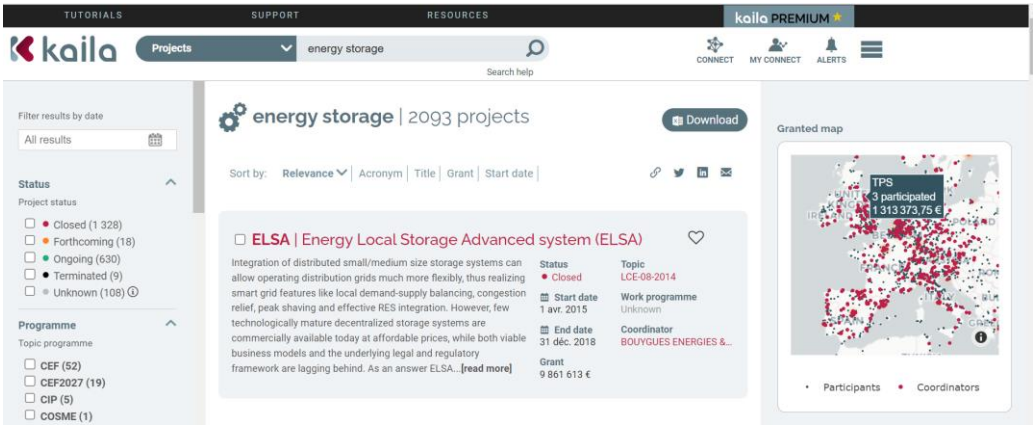

Figure 3 : Filtering result per key words: "energy storage"

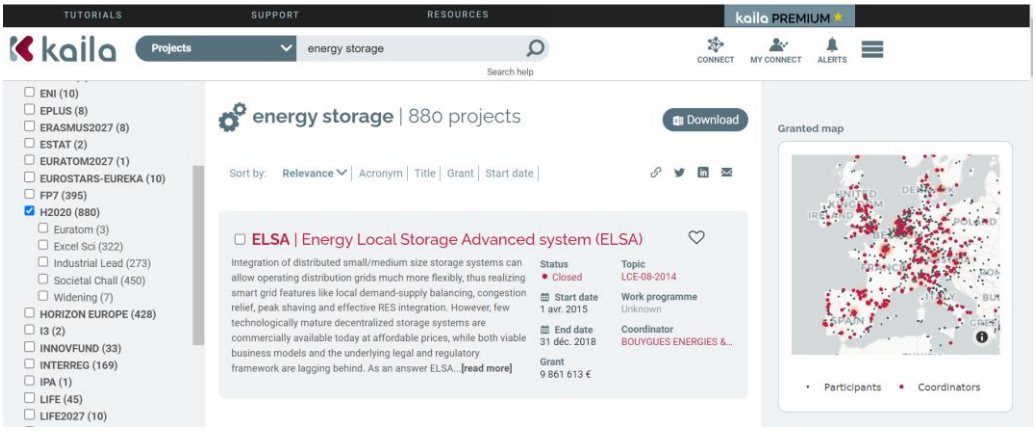

Figure 4 : Filtering results per programme: H2020

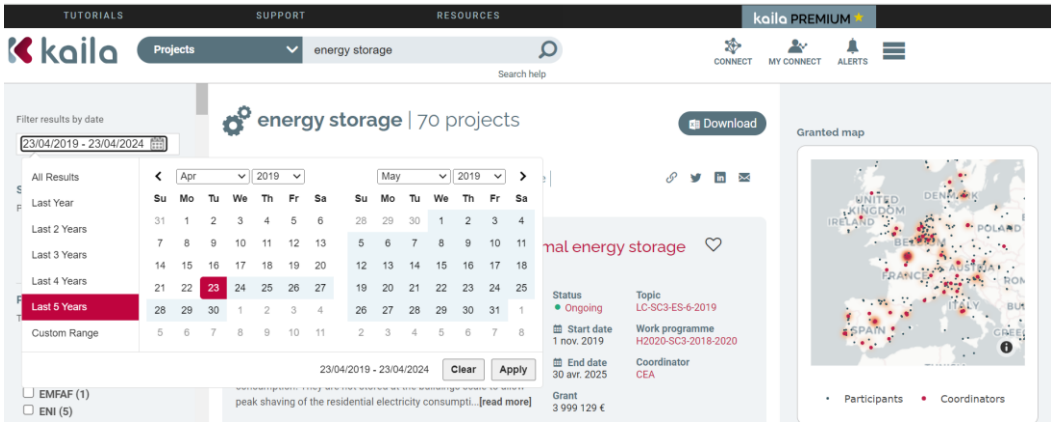

Figure 5 : Filtering results per date: In the last 5 years

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Annex II - Questionnaire

EU Innovation Fund – Eligibility and readiness assessment

Questions on concept and innovation

This form will provide an initial assessment of the proposal eligibility in compliance with the EU Innovation Fund. Please include higher-level detail as much as possible for the following questions:

Project overview	
Please provide a brief description of the project (project summary). Include the project name if already available.	
Describe the background and rationale of the project as well as the primary objectives of the project. Describe the target market on which the project will compete.	
What will be the project location? *Please note that only actions implemented on the territory of one (or more) of the EU Member States, Norway or Iceland are eligible for funding under this call (overseas countries and territories not included). Currently, as per the agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community and specifically Annex 4 thereof, projects located in the UK are not eligible, except projects located in Northern Ireland on the condition that the project concerns the generation, transmission, distribution or supply of electricity.*	
Have any of the participants already benefitted in the past from funding for the technology considered from other EU programmes (Horizon 2020, Horizon Europe, LIFE, etc.) or state aid support?	
GHG Emissions Avoidance potential	
Please allocate your project in one of the categories provided *(highlight relevant answer)*	
What is the project's principal product? What will be its main application? Will there be any secondary products?	
Degree of Innovation	

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How does this innovation compare to the state of the art? Indicate which of the parameters below are met by the project innovation and justify the answer choice(s). • It differs from that normally offered by vendors/technology suppliers • It is not currently offered by multiple vendors or as a standard product or service Its expected outcomes are innovative or distinctive compared to existing solutions • It is further advanced from previously conducted demonstrations • System integration: combination of existing technologies not integrated today • Existing technical solutions are applied to a new sector or usage field	
Are there some elements of the project technological innovation that can be considered very strong or breakthrough (likely to be present in completely new technologies or processes or new products/services that substitute existing products)? Please elaborate.	
Project maturity	
What will be the main project's technology? Please provide a brief overview of the system level information that will enable the applicant to implement the innovation.	
What is the current state of development of the project? Can you provide an estimation of the TRL[1] level before and after the project implementation?	
What will be the project's total budget? How do you plan to finance the technology implementation (e.g. equity, debt, additional national/EU funding)?	
Will the project be implemented by a single applicant or by a consortium? If relevant, have all the consortium members being already identified?	
Is the work towards the project implementation already started (e.g. permits application, shareholders agreements preparation)? Do you have an estimation of the timeline to reach the Entry into Operation[2]?	
Project Scalability potential	
Is there any perspective to scale up the technology at the site level?	

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Is there any perspective to scale up the technology in different locations? If yes, which locations have been identified and what would be the main challenges foreseen?	
Will the technology be patented and/or are there licences needed for the project implementation?	

Who is operating, Freedom to operate

Owner of the technology

[1]Technology readiness levels (TRL):

- **TRL 1** – basic principles observed
- **TRL 2** – technology concept formulated
- **TRL 3** – experimental proof of concept
- **TRL 4** – technology validated in lab
- **TRL 5** – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- **TRL 6** – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- **TRL 7** – system prototype demonstration in operational environment
- **TRL 8** – system complete and qualified
- **TRL 9** – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

[2]Entry Into Operation: the moment in the project development cycle where all elements and systems required for operation of the project have been tested and activities resulting in effective avoidance of greenhouse gas emissions have commenced

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