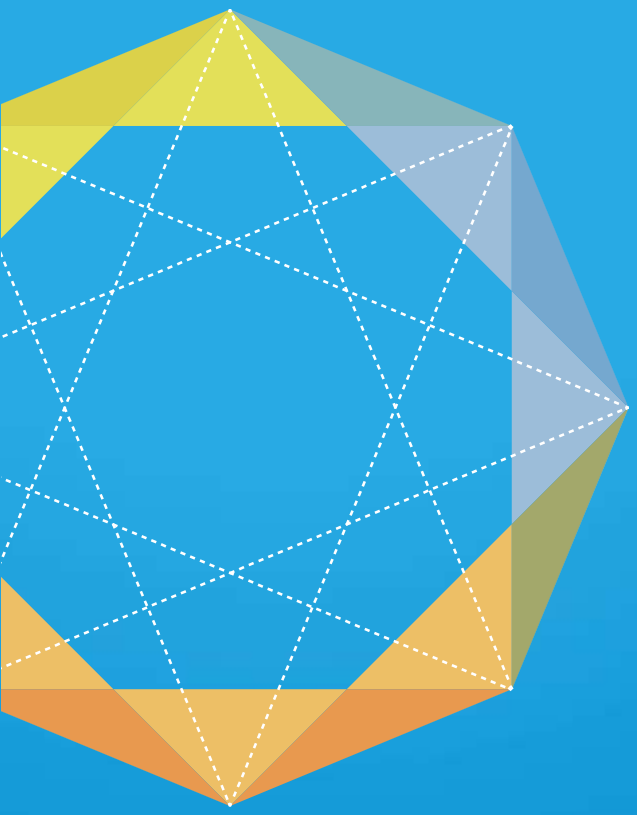
European Commission

17th ETIP SNET Regional Workshop

Key Recommendations & Conclusions



ETIP SNET

European Technology and Innovation Platform

Smart Networks for Energy Transition

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1. Introduction

The 17th Regional Workshop invited owners/mangers of national or regional funding programs in the Western Region to present and discuss their national energy and innovation programs. The Workshop's goal was to shed light to actual challenges and key topics of sustainable energy system in Europe.

The Workshop was organised on 22th of March, in the Vaasa Energy Week in Vaasa, Finland allowing for the participation and attendance of a wider range of stakeholders and actors in the energy field.

This session aimed to bring together owners and managers of national and regional funding and development programs with the European Commission and ETIP SNET representatives from research and industry. This exchange fostered direct exchanges between the EU and the regional/national representatives for a common understanding of national and EC programs proposed in the ETIP SNET Implementation Plan (IP) and Roadmap (RM). The moderated discussion was based on the High-Level Use Cases (HLUC) and Project Priority Concepts (PPCs) defined within ETIP SNET IP. Many topics of our future energy system in Europe were covered. Representatives of national and regional funding and support programmes met in order that European Commission and representatives of European Associations in (ETIP SNET) learn from each other, streamline their approaches and create synergies.

The following structure was designed to bring a more coordinated exchange between member state level and EU level state level with respects to the research areas of the ETIP SNET Working Groups and the BRIDGE initiative, as well as with a view to contributing to the ETIP SNET Implementation Plans and Road Map.

The first part of the workshop included an introduction to the overall structure of ETIP SNET and BRIDGE and an overview of the ETIP SNET Roadmap for 2022-2031. The platform's vision for 2050 and the two main concepts – High-level Use Cases (HLUC) and Priority Project Cases (PPC) were shared with the attendees. After a more in-depth analysis of HLUC, from HLUC 1 to HLUC8, national/regional representatives (including Business Finland, Swedish Energy Agency) were invited to elaborate on funding priorities for national/regional projects in Northern Region.

Panel Session: National/Regional reps of the workshop saw the discussion around Western funding program representatives particularly Business Finland, City of Vaasa for a municipal perspective, Tartu Regional Energy Agency and Sweden's Energy Agency. Speakers elaborated on the project details, main concept, achievements and progress, as well as barriers and perceived challenges. Additionally, funding programme scopes in comparison to the different HLUC were highlighted.

Projects Panel Session 1 consisted of presentations from invited speakers regarding BRIDGE projects with respect to all HLUC. The speakers were asked to provide a 3-minute pitch about their respective project, which was then followed by feedback and discussions from the moderator. The session involved presentations of projects OneNet and Re-Empowered.

Finnish Research with Impact Session consisted of presentations from invited speakers from Finnish representatives of Finnish companies. The speakers were asked to provide a 3-minute pitch about their respective company and what role they play in the innovation pipeline, which was then followed by feedback and discussions from the panel. The session involved panellists from ABB, Wartsila, Clic Innovation and Enerim.

National and Transational RDI for Nordic and Baltic regions consisted of presentation from Lise Nielsen regarding the Nordic Council of Ministers and how this entity synergises with national funding programs and cooperates internationally.

Projects Panel Session 2 consisted of presentations from invited speakers regarding national and transnational projects with respect to all HLUC. The speakers were asked to provide a 3-minute pitch about their respective project, which was then followed by feedback and discussions from the moderator. The session involved presentations of projects FlexSUS, NewSETS, DEVISE, Hellesylt Hydrogen HUB, E-REGIO

More information concerning these projects and structure of the sessions can be found in the proceedings.

2 Structure of this Document

The document is made up of the key comments made in each session and whenever possible by the presenters of each project that had a mapping of the project's focus onto the ETIP SNET's 9 HLUC. These recommendations are then incorporated into the conclusions drawn by Rainer Bacher, a representative of the ETIP SNET CORE Team.

3. Recommendations & Conclusions

3.1 Representative Roundtable

Panel Session: National/regional representatives Emphases and concerns of national funding programmes Recommendations for further development of Implementation Plans and Roadmaps

50 shades of EU – from participant to influencer, Reijo Munther, Business Finland

The priority on European sovereignty in strategic technologies and value chains has been highlighted, with a goal of reforming EU markets.

It has been noted that EU provides tools which are fully in line with national strategy. In particular, EU offers a frame and funding for collaboration, innovation and investments in strategic areas, such as European collaborative RDI in Horizon Europe and its industrial partnerships, Pilots and first deployment of green technologies in Innovation Fund, etc.

Maria Backman, City of Vaasa, Strategy

The importance of the partnerships developed within the project has also been highlighted, while indicating the importance of being in a group in a larger perspective.
The tight connection between the universities, companies, and city government in Finland has been highlighted, while indicating the engagement and cooperation with citizens as well as all stakeholders. It has also been noted that sustainable development goals have been linked to the city strategy.

Ulo Kask: Tartu Regional Energy Agency

Ulo Kask presented the trends and goals of the Estonian energy sector.
Regarding research and Innovation, it has been noted that hydrogen is taken into account in the industry and transport, while offshore wind parks should also be considered, in addition to the evaluation of plans related to biomass. Horizon provides a number of opportunities for European collaboration in these fields, so it could be worth considering this collaboration in the future.

Fredrik Lundström – Swedish Energy Agency

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The following challenges are identified: 1) electrification, considering the doubling of the electricity demand in 20 years, 2) expand renewable and nuclear production to meet this demand and 3) energy security and resilience not only in the energy supply but also in all the value chains, considering an industrial perspective. The importance of industrial decarbonization has been highlighted putting a lot of emphasis on green hydrogen production. Regarding research and Innovation funding, it has been noted that it mainly occurs in a local basis. However, collaboration in an international level is important and is achieved with partnerships, like the clean energy transition partnership.

Project Panel Session -1

Kalle Kukk – OneNet project

Kalle Kukk presented the OneNet project which focuses on tackling the flexibility market issue, while also examining issues related to data management.
The relevance of the project to each HLUC is depicted in the next figure:

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
OneNet (funded by Horizon 2020)	●	●●●	●●●	●●	●●●	●	●	●	●●	

●●● extremely relevant
●● highly relevant
● relevant to some degree
n/a – don't know

Figure 1 OneNet mapped onto each HLUC

The project mostly relates to HLUC-2 since it defines the products which can be commonly procured and optimized centrally for different needs and different buyers. Additionally, in relation to HLUC-3, the project develops a market design, looking at it from the consumer centric product definition perspective. The project defines the harmonized products processes, like the pre-qualification, settlement or activation and also the common tools, like the flexibility register. Related to HLUC-5, the project aims to create an integrated platform that will enable the participation of consumers to the flexibility market.
It has also been noted that it is important to evaluate synergies among national (e.g. congestion management) markets with European (balancing) markets. Moreover, it is important to identify how to let demand side flexibility enter the supply side of the day-ahead and intraday wholesale markets. In order to engage small end customers, it is important to understand their needs and behavior to provide them with solutions that are tailored to their preferences. Surveys can be a useful tool to gather information and insights from customers. Additionally, making the energy market more seamless and user-friendly (e.g. through plug-and-play apps) can help to attract more customers and make it easier for them to participate in the market.

Maria Valliou, RE-EMPOWERED

Maria Valliou introduced the RE-EMPOWERED project, which is a Horizon 2020 project that aims to develop and demonstrate solutions for energy transition in Europe and India.
Overall, the project aims to demonstrate the benefits of using microgrids to improve energy efficiency and increase renewable energy penetration in local and wider systems.

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
RE-EMPOWERED funded by EC (CINEA) (European partners) and Indian DST (Indian partners)	●●			●●●	●●●	●				

Figure 2 Empowered mapped onto each HLUC

Research with impact – the Finnish way.

Petri Hovila, Programme Manager at ABB

Petri Hovila presented the ABB Green Electrification 2035 project which aims to optimize the system-level energy efficiency and reliability. The project combines an ecosystem of partner projects and ABB R&D work. The project consists of the development of two main platforms, namely the power conversion platform and the commercialization and global scaling platform. The platforms are more open and connectable compared to the past, allowing the creation of an ecosystem over these platforms. ABB Business Finland reserved €50 million for this ecosystem project, and there are different application examples that customers and research partners can utilize. The project has involved over 60 companies, research partners, and customers. There are over 80 national new applications and over 50 European-like horizon Europe applications submitted during the project. There are also two new ecosystems where ABB has been a key player, namely the H2 Cluster Finland and the vPAC Alliance. The developed systems are complex and need further research and faster implementation of the research results into the real platforms. One of the challenges the team has encountered is implementing large-scale pilots and demonstrations. The team has tried to match potential new pilot demo sites with the involvement of an innovation project.

The relevance of the project to each HLUC is depicted in the next figure:

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
ABB Green Electrification 2035 (Business Finland)	●●	●	●●	●●●		●●	●●●			

Figure 3 ABB Green Electrification mapped onto each HLUC

Kenneth Widell, Programme Manager at Wärtsilä Smart Technology Hub

Kenneth Widell's presentation focused on the importance of funding and strategic alignment for private companies. He emphasizes that companies must have stability in their strategic planning and focus on strategic alignment to be successful. It has been noted that funding mechanisms for projects can take years to be approved, and companies must be patient and stick to their strategy. Kenneth emphasized the importance of openness, transparency, and expectation management within the consortium to ensure a win-win outcome for all parties. He suggested that companies should try to influence the calls to get ahead of the competition and identify common interests. Kenneth recommended that companies identify their place in the value chain and be aware of competitors in the consortium. He mentioned that it is important to raise flags with partners immediately when something occurs.

Pia Salokoski, clic innovation, Senior Advisor for RDI in Finland and Clean Energy Transition Partnership

Pia Salokoski, introduced her organization, Clic Innovation, which is a cluster organization owned by 46 large international companies, universities, and research organizations. The organization aims to increase the impact of RDI projects by preparing, coordinating, and managing them, and by solving systemic challenges. To achieve these goals, Clic mixes industry from different sectors, universities, and other stakeholders to create an ecosystem of ongoing, continuous discussion.

Clic manages an ecosystem called Green Electrification Ecosystem, which brings together different companies, SMEs, startups, large companies, research organizations, and public organizations. Additionally, the organization has a toolbox consisting of four different phases: exploring the ecosystem, building the projects in the ecosystem, accelerating those projects to be more business-oriented, and maximizing the impact of the projects' findings.
Clic emphasizes the importance of impact maximisation efforts, which is a topic that needs to be emphasized in EU projects. Therefore, Clic expresses the need for a joint, common discussion framework between different stakeholders. For example, researchers from different countries can provide interesting insights, and companies can bring valuable knowledge to researchers. Communication between researchers and companies is essential, especially for SMEs, which cannot wait years to get the right results for their development.

Jan Segerstam, Enerim Oy, expert for transforming technologies

Jan Segerstam mentioned the importance of strategic alignment. He emphasized the significance of readiness, which means preparing for any unexpected event and understanding the impact it could have. To achieve actual impact, the right people need to be involved, a plan needs to be in place, and execution should be prompt. Segerstam believes that this is the Finnish way of collaborating and creating new things in the energy sector.
Segerstam introduced his company called Enerim, which provides services and software for the energy sector. Segerstam discussed the important changes happening in the energy sector, driven by renewable production, which is expected to be larger than it is today. He commented on how all different industries need to work together to find out what works best where. He mentioned that there is a big change happening and that ways should be found to build Readiness and make things happen in a good way. Segerstam also emphasized the importance of collaboration with the industry and the customers to innovate in the energy sector.

Panel Discussion

Revisiting Technical Readiness Level (TRL) vs Market Readiness Level (MRL)

Ludwig Karg opened the discussion by mentioning the importance of readiness levels, specifically TRLs, in funding programs. He then raised the question of whether MRLs are discussed in the ETP network. Jan Segerstam agreed and suggested that the focus should be on achieving market readiness to create impact. He also suggested revisiting the scale, as the TRL scale has a history and background that might not be suitable for measuring market readiness.

Kenneth Widell emphasized the importance of involving end-users and stakeholders early in the development process. He mentioned that the entire value chain should be involved, as it is not enough to have a product or a solution that can be used or burned in engines.
The panelists then discussed the possibility of combining national and European projects and stakeholders for joint impact. Jan Segerstam mentioned that national efforts might have limitations that do not allow working on certain levels. However, combining efforts in the European Union can be used to change the game across Europe, which can then be followed by national efforts.
The discussion concluded with the agreement that involving end-users and stakeholders early in the development process is crucial for achieving market readiness and creating impact. The panelists also agreed on the importance of revisiting the readiness scale and combining national and European efforts for joint impact.

National and transnational RDI for the Nordic and Baltics regions

Lise Nielson, Senior Adviser of Nordic Energy Research (NER)

Lise Nielsom introduced Nordic Energy Research which is funded by the Nordic countries and allocates funding for energy research projects through a common pool and national funding instruments. The cooperation within the NER has existed for more than 40 years and covers the Nordics and Scotland. To be eligible for funding, at least three Nordic countries have to participate in a proposal. Nordic Energy Research has active programs such as the Joint Nordic Hydrogen Programme, Nordic Grand Solutions, Nordic Maritime Transport and Energy Research Programme, Nordic-Baltic PhD network and researcher mobility, Nordic Energy Challenge, NordGrid, Nordic Energy Equality Network Discussion.
Following the presentation, the discussion focused on the importance of including diverse perspectives and considering the needs of people while implementing renewable energy. It also highlighted the need for educating the existing workforce to handle renewable energy technologies. The discussion emphasized the connection between sustainable development and energy transition.

Projects Panel Session 2: Transnational, National, Local projects

Juhani Riikonen, Flexens

Juhani Riikonen, presented the Project NewSets, which focuses on energy storage and sector coupling, emphasizing on thermal energy storage and underground pumped hydro storage.
The discussion focused on the concept of "cannibalization" in the energy storage market. The participants discussed the reasons behind this phenomenon, which is essentially the competition between different types of energy storage, leading to a decrease in earnings for the original storage system. They talked about how the introduction of a new storage system affects the earnings of the existing one, and how this phenomenon is case-specific and can depend on factors such as the amount of storage and market conditions. They also discussed how the capital cost of storage can influence the decision to implement storage systems, and the potential impact on the growth of renewable energy if storage is not implemented.
The relevance of the project to each HLUC is depicted in the next figure:

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
NewSETS (ERA-Net SET Joint Call 2019 MICall19)	●●●		●●	●●●						

Figure 4 Flexens mapped onto HLUC

Rajnish K Calay, UiT Norway's Arctic University

Rajnish K Calay presented the project called "Different Energy Vector Integration for Storage of Energy" (DEVISE) which is a project coordinated by the Indian Institute of Technology in Roorkee, with partners from India, Norway, Italy, and Sweden. The objective of the project is to create a comprehensive storage system that can efficiently and rationally utilize all forms of energy. The project aims to integrate different energy vectors for ease of storage and facilitate the conversion from one form to another. This will be achieved by creating a heterogeneous storage facility for diverse forms of energy and facilitating their conversion from one form to another to optimally cater to different loads. Currently, energy from various renewable sources is primarily converted into electrical energy for ease of transportability, but the predominant electrical storage prevents the efficient and rational end-use of other forms of energy, especially heat. A holistic approach is needed to integrate and transform different forms of energy for rational

end-use and storage of all forms of renewable energy, enabling optimal interchange. The project is mainly relevant to HLUC1, HLUC8 and HLUC9. The presentation concluded by highlighting that the project's findings, so far, indicate that thermal storage and hydrogen storage are viable options for industrial processes.
The relevance of the project to each HLUC is depicted in the next figure:

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
DEVISE (MI Call 19...)	●●							●●	●●●	

Figure 5 DEVISE mapped onto each HLUC

Heidi Tuiskula, Norwegian Hydrogen

Heidi Tuiskula from Norwegian Hydrogen presented their work in three major business segments related to hydrogen: on-site production, industrial applications, and refueling. Their project, the Hellesylt Hydrogen Hub, aims to leverage the abundant renewable energy in the Hellesylt location and address transportation challenges through hydrogen-based mobility solutions. The project also intends to explore sector coupling.

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
Hellesylt Hydrogen HUB (Research Council of Norway/Innovation Norway)	●●		●●	●●	●			●●●	●	

Figure 6 HHH mapped onto HLUC

The discussion focused on the potential of hydrogen as storage and its transportation. Heidi Tuiskula pointed out the practicality of producing hydrogen where it's needed, which reduces the logistical complexities. Hydrogen's potential is also emphasized as a local storage medium. However, for larger scale production, the use of pipelines or vessels for transportation needs to be considered. The key areas of focus for Norwegian Hydrogen's application of hydrogen solutions were identified as maritime solutions and heavy transport. The discussion concluded with the acknowledgement that, while there are unresolved issues in the field, there is an urgent need for implementing available solutions as some areas already require hydrogen-based solutions.

Iliana Ilieva, Smart Innovation Norway

Iliana Ilieva presented the work conducted by Smart Innovation Norway; a research organization established in 2003 based in the Southeast corner of Norway.
The project concentrated on three high-level use cases: local markets, digital technologies to facilitate consumer participation in these markets, and the provision of flexibility services. It further investigated additional topics related to peak shaving, surplus storage, shortage, and peer-to-peer trading. In Norway, the project utilized local production of photovoltaic energy and local storage, combined with local demand, to establish a local market. This was facilitated by multi-energy trading algorithms that could locally optimize bids and ask for flexibility and energy. The Swedish pilot focused on vehicle-to-grid and vehicle-to-building energy, aiming to provide balancing services to the market.

The relevance of the project to each HLUC is depicted in the next figure:

project / program	HLUC 1 Local market platform for flexibility trading	HLUC 2 Community storage	HLUC 3 Distributed PV generation	HLUC 4 V2G	HLUC 5 V2B	HLUC 6 Battery control room	HLUC 7 E-mobility services
E-REGIO (ERA-Net Smart Gris Plus)	●●●	●●●	●●	●●●	●●	●●	●●

Figure 7 ERegio mapped onto each HLUC

The discussion focused on the topic of local versus global marketplaces. The necessity of local marketplaces for

trading local products was questioned, suggesting the possibility of trading local products on global marketplaces. Ilieva responded by stating the benefit of having isolated cases for trading, particularly when connectivity to the central market is not feasible.

Claire Bergaentzlé, DTU Denmark

Claire Bergaentzlé presented the Flexibility for Smart Urban Systems project (Flexus). The goal of the project is to support city representatives, planners, and energy planners in their efforts to drive sustainability. Three models are developed to help municipalities understand how to expand district heating and individual heating resources and technologies. The project revealed some important findings and discrepancies, including a gap in the cost of investing in a decarbonized heating system and the misallocation of subsidies due to discrepancies in heat estimates.
The relevance of the project to each HLUC is depicted in the next figure:

project / program	HLUC 1	HLUC 2	HLUC 3	HLUC 4	HLUC 5	HLUC 6	HLUC 7	HLUC 8	HLUC 9	other
FlexSUS (ERA-Net RegSys)	●●●		●	●●				●	●●●	

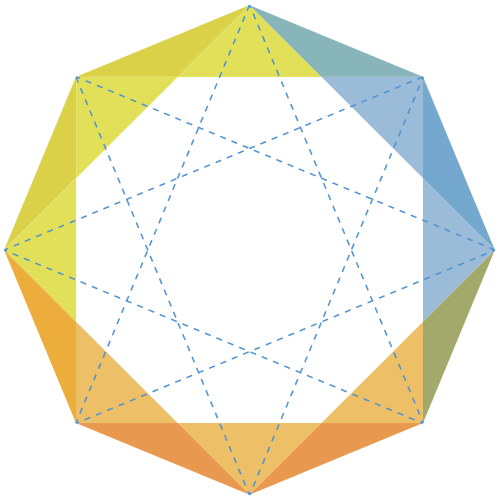
Figure 8 Flexsus mapped onto each HLUC

The discussion focused on the topic of volumetric tariffs against low-income citizens. Claire Bergaentzlé clarified that while volumetric tariffs can protect low-income consumers, it may also hinder investment into electric cars and heat pumps.

CONCLUSIONS

Rainer Bacher presented the concluding remarks of the workshop. He mentioned the importance of the collaboration between ETIP-SNET and BRIDGE. During the workshops, ETIP-SNET's Roadmap and Implementation Plan have been presented, focusing on the High-Level Use Cases. Summarizing the workshop, Rainer highlighted the importance of such events to broadening the knowledge and understanding the energy sector, both its technical and sociopolitical.

He commented on the term "business R&D" that was mentioned during the sessions and highlighted the difference between what the projects are doing and what the industry is heading. He also underscored the importance of balancing national and regional projects. Developing and using common platforms is useful since it increases the interaction between the projects. The projects and the research results should increase the interactions between scientists, policy makers and business entities, since there is an increasing need to integrate the business side to the projects. From a more technical aspect, he highlighted the important research question of decentralized against centralized solutions, the strategic reflections of cannibalization of storage, the role of disruptive, non-conformist solutions and the increasing research interest on green hydrogen.



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