Summary of the final report

Regulatory experimentation for renewable energy in Ostrobothnia

8.4.2026

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

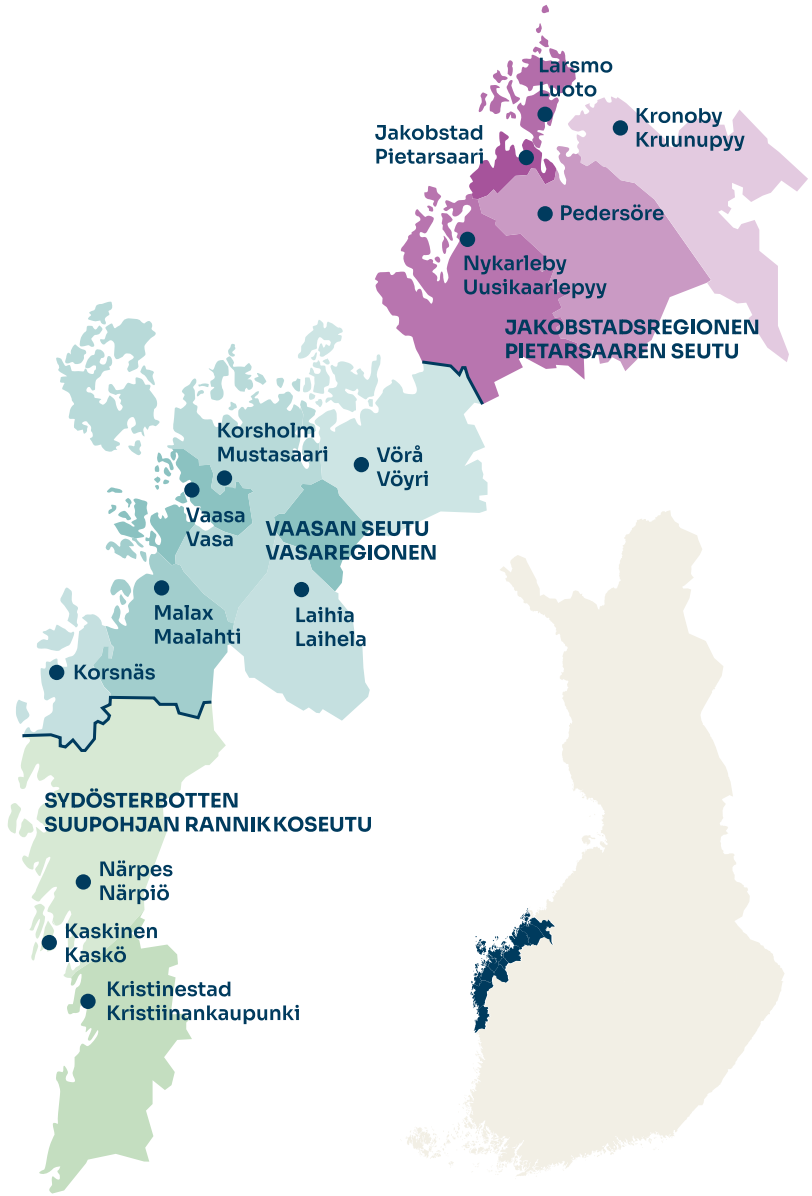
Content

1. Study background, objectives and methodology
2. Context and rationale for regulatory experimentation in Ostrobothnia
3. Regulatory sandbox for renewable energy in Ostrobothnia
    A. Regulatory policy platform
    B. Market accelerator
    C. Regional regulatory experimentation zone
4. Proposed schedule and next steps

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

1. Study background, objectives and methodology

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO



Study background and objectives

- The Regional Council of Ostrobothnia is implementing a development project "**Regulatory Experimentation and Innovation-Friendly Regulation in the Energy Sector**", which is part of the European Parliament's Preparatory Action Innovation for Place-Based Transformation initiative.
- Ostrobothnia has been selected as the local focus area for an experiment aimed at reducing the use of fossil fuels.
- The local experiment focuses on regulatory experimentation and regulatory sandboxes.
- To support the project, the Regional Council of Ostrobothnia commissioned a study to co-develop a concept for a regulatory experiment serving Ostrobothnia's regional energy ecosystem.
- The aims of the study were to a) define pilot areas, key objectives, required regulatory exemptions, b) clarify the roles, responsibilities and tasks of regional stakeholders, and c) secure stakeholder and partner interest and commitment to the experimentation.
- The study, conducted by Forefront Ltd, started in September 2025 and was completed in March 2026.

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Study process and methodology

The process – based on a participatory process and broad consultations with regional and national stakeholders and regulatory experts – included the following methodology:

- **Document analysis.** The documents included existing reports, studies and other available documentation regarding a) Ostrobothnia energy sector ecosystem, b) energy sector regulations and bottlenecks (particularly around green hydrogen), c) regulatory experimentation and sandboxes, and d) relevant EU and national level regulations and regulation-related documentation.
- **Interviews.** Several discussions and interviews included contribution from regional and national stakeholders as well as experts of energy sector regulation. Altogether, 18 interviews were conducted, involving a total of 24 participants.
- **Workshops.** Two workshops organised (October 2025 and February 2026) supported collection of the regional insights as well as validation of the concept of regional experimentation zone. Both workshops were attended by approximately 25 participants.

Key organisations involved in the process

- Gasgrid
- Westenergy
- Fingrid
- Hitachi Energy
- Wärtsilä
- Danfoss
- ABB
- EPV Energy
- Liquid Wind
- Etha Consulting
- Vaasan sähkö/EnergySampo
- Business Kristiinankaupunki
- Merinova
- Åbo Akademi
- Novia
- VASEK
- University of Vaasa
- University of Helsinki
- The Ministry of Economic Affairs and Employment – innovation department & energy department
- Energy Authority
- Finnish Energy (TBC)
- Business Finland
- Sitra
- Hanken
- European Commission, JRC

2. Context and rationale for regulatory experimentation in Ostrobothnia

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Ostrobothnia energy cosystem provides a strong foundation for a successful regulatory experiment

- Ostrobothnia has an exceptionally strong energy technology ecosystem, and an emerging green hydrogen ecosystem.
  - The region hosts the largest energy technology hub in the Nordic countries, bringing together a dense network of industrial companies and technology developers, SMEs, and research institutions
- Currently there are several significant ongoing or planned investments in renewable energy and green industries including green hydrogen in Ostrobothnia region.
  - In recent years, the total (planned and realised) volume for hydrogen investments in Ostrobothnia has been four billion euros and the investments for carbon capture and processing 138 million euros. (Source: EK. Data Dashboard)
- Renewable energy and green hydrogen also strongly emphasised in national policies.

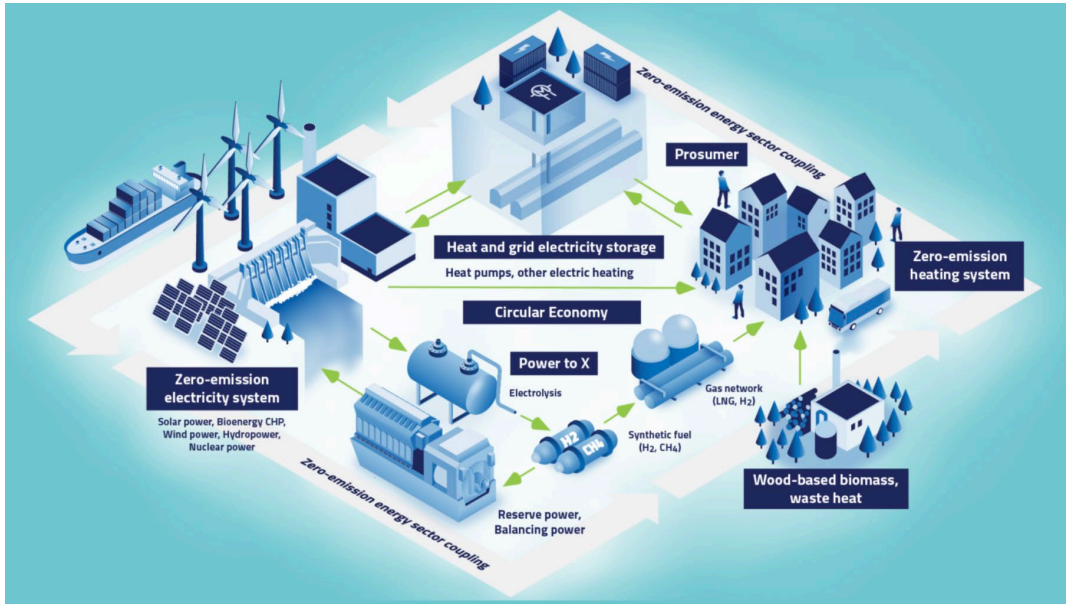


ABB Danfoss Hitachi Energy VAASAN SÄHKÖ VEO VNT MANAGEMENT WÄRTSILÄ

Pictures: EnergySampo

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Regulatory bottlenecks are hampering the ecosystem competitiveness

- Both **EU and national level regulations** are currently hampering the development the energy ecosystem in Ostrobothnia
  - Particularly for green hydrogen, an important bottleneck is related to the interpretation of CO2 sources as part of the EU Emission Trading System (ETS) and EU regulation for Renewable Fuels of Non-Biological Origin (RFNBO).
- Another related key bottleneck is the **lack of viable business models and market incentives** (including taxes & electricity pricing).
  - Green hydrogen technologies are currently more advanced than business models, and investments will not proceed without clear business cases and incentives.

Picture: University of Vaasa

Increasing need for regulatory flexibility and experimentation

- Currently there is a **strong need and encouragement for regulatory flexibility and experimentation** at the EU level.
  - *Draghi Report on the Future of European Competitiveness*, the *EU Startup and Scale-up Initiative*, the *European Innovation Act*, *AI Act* and the *Net-Zero Industry Act all highlight the importance of regulatory flexibility and sandboxes.*
- Commission has been preparing common rules for the establishment and operation of AI sandboxes through an **implementing act** (in process at the time of writing).
  - Similar process is ongoing/planned for the Net Zero Act, and it is estimated to taking place in the spring 2026.

- **The Finnish energy market is tightly regulated, and there have been increasing calls for regulatory experimentation and the introduction of regulatory sandboxes in the energy sector in Finland**.
  - Recently the issue has also been raised at parliamentary level in the Economic Affairs Committee
- The current Electricity Market Act (588/2013) allows the construction of **closed electricity networks** and **flexible tariffs** (under specific conditions)…
- …but **does not include regulatory experimentation clauses** which would be necessary for any broader experimentation.
  - Inserting such clauses would require a **significant regulatory reform (and political mandate).**
  - In some countries (e.g. Germany and Netherlands) legislation has been refined to include experimentation clauses.

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Opportunities (and limitations) for regulatory experimentation

- Regulatory experiments (especially sandboxes) are best suited for initiatives and topics, where
  - there is a need to better understand the impacts of regulations on markets and new innovations,
  - and to explore how regulations could be improved to support the development of new innovations or business models.
- In contrast, they can be unnecessarily complex and less suited for cases, where the regulatory bottlenecks and potential solutions are already known.
- The challenges related to ETS and RFNBO are examples of the latter and the challenges are also based on strong and complex EU regulations.
  - These challenges are not best addressed through (regional) experimentation, but instead through regulatory changes/interpretations on EC/national level.
- Experimentation should therefore focus on business models and market incentives, modelling pricing and incentive structures across the green hydrogen value chains.
  - Setting up this kind of regional experimentation is currently not yet possible in the Finnish regulatory context.

3. Regulatory sandbox for renewable energy in Ostrobothnia

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Recommended approach for the regulatory sandbox

Build foundations for a 'green hydrogen experimentation zone' *in Ostrobothnia with the following* ***first steps:***

1. ***Establish a regulatory policy platform*** *to provide insights and lessons for national and EU-level energy sector regulatory reforms and experimentation, and a platform for dialogue between energy sector companies and regulators.*
2. ***Launch a collaborative RDI initiative*** *('market acceleration') for developing and modelling business models and supporting the market uptake of innovations, for example related to green hydrogen.*

It is recommended that while the concept as such should not be limited to specific energy sector technologies or topics, the initial thematic focus of the concept would be on the ***green hydrogen and its derivatives****, given its strategic importance for the regional energy ecosystem.*

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Overall goal and purpose of the concept

The overall goal of the concept is to ***strengthen regional, national and EU-level competitiveness*** *by creating a regulatory environment that* ***enables experimentation, supports regulatory learning, and reduces uncertainty for investments*** *in emerging renewable energy technologies and business models.*

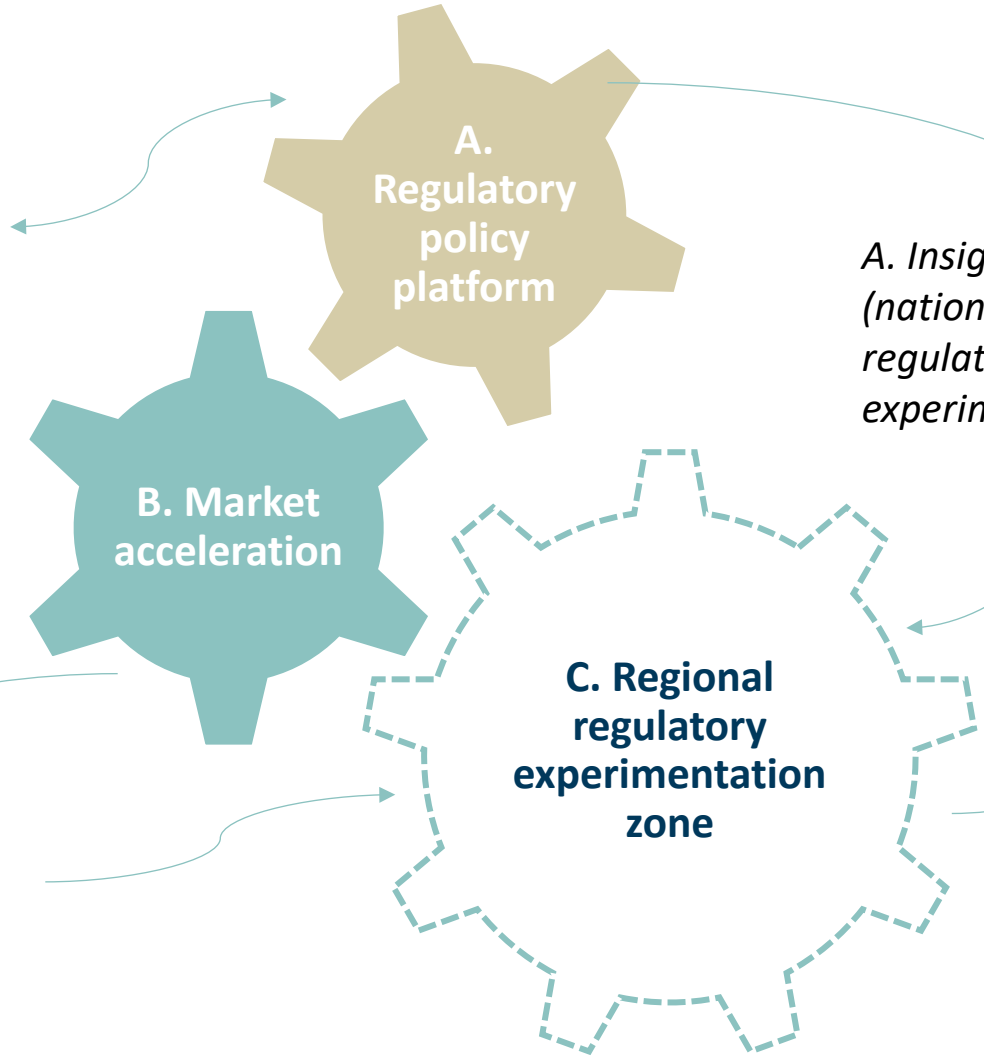
By providing a structured framework for regulatory experimentation, the concept would allow ***companies and regulators to jointly test new solutions, generate evidence on how regulation works in practice, and inform the development of more adaptive and innovation-friendly regulatory approaches****.*

In this way, the initiative would support both the deployment of clean energy solutions and ***position Ostrobothnia and Finland at the forefront of the clean industrial transition***

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Concept overview: Regulatory sandbox for renewable energy in Ostrobothnia

A. Foresight on regulatory needs and anticipation of bottlenecks based on concrete business cases. Regulatory outlook and guidance for start-ups and businesses.



A. Insights and lessons for (national and EC) regulatory reforms and experimentation.

B. Developing and modelling sustainable business models and market dynamics.

C. Experimenting new business solutions and models under real operating conditions and market mechanisms.

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

A. Regulatory policy platform

Key objectives and deliverables

- *Providing foresight on regulatory needs and anticipation of bottlenecks for renewable energy (e.g. green hydrogen) business models to support national and EC regulatory reforms.*
- *Providing recommendations and insights for policy reforms and potential regulatory experiments, as well as guidance and updates on planned and ongoing regulatory reforms.*
- *Building foundations for module C by providing concrete and visual examples, models, and frameworks,*
- *Facilitating structured dialogue between regulators, businesses, and research organisations*

Added value for key stakeholders

- *For public authorities and regulators : evidence-based understanding of how regulatory frameworks influence innovation, investment decisions, and market formation*
- *For companies: increased regulatory clarity and predictability, better anticipation of bottlenecks and aligning investments with evolving regulatory requirements.*
- *For research and higher education institutions: to contribute to and study regulatory development processes, strengthening their role as knowledge partners in national pilot initiatives.*
- *For regional development actors: improved coordination and cooperation between policy, business, and research communities, as well as more transparent and predictable regulatory processes at regional level*

Implementation and roles of key actors

- *Initially organised as an informal project- or network-based collaboration, building on existing actors and networks. The Regional Council of Ostrobothnia taking the leading role in organising the next steps.*
- *After the initial phase, opportunities for a more institutionalised model could be explored.*
- *Other key actors are energy sector and clean tech companies (providing insights on regulatory needs and bottlenecks), national authorities and regulators (e.g. the Energy Authority, the Ministry of Economic Affairs and Employment, and the European Commission, contributing information on planned and ongoing reforms), as well as universities and research organisations.*

Funding options

- *Initially (pilot) based on based on regional development funding. Later: scaling to a national (or EU-level) network with funding from national sources (e.g. Business Finland, Sitra) or EU funding (e.g. Horizon Europe).*
- *In-kind hours / contributions from stakeholders*

Concrete next steps:

- *Organising a network of experts and stakeholders and schedule regular events/meetings for 2026.*
- *Initiate a research study for modelling the regulatory experimentation zone in Ostrobothnia (Module C) and preparing concrete policy recommendations for enabling and supporting energy sector regulatory experimentation and sandboxes.*

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

B. Market acceleration

Key objectives and deliverables

- *Co-development of green hydrogen business models and modelling of green hydrogen markets to illustrate market potential and regulatory bottlenecks.*
- *Connect energy ecosystem actors and ongoing RDI projects with regulators through the regulatory policy platform*
- *Concrete case examples focusing (at least initially) on selected green hydrogen value chains, as well as evidence and insights that directly feed into the work of the regulatory policy platform.*
- *Virtual modelling of a regional experimentation zone (Module C).*

Added value for key stakeholders

- *Primary stakeholders: companies and research organisations within the Ostrobothnia energy ecosystem, especially EnergySampo and existing Veturi initiatives and related co-innovation projects in Ostrobothnia.*
- *For companies: enabling the co-development and validation of new business models and strengthening collaboration with research institutions and public actors*
- *For research and higher education institutions: access to collaborative RDI projects, and interdisciplinary research opportunities*

Implementation and roles of key actors

- *Initially organised as a collaborative co-creation or co-innovation project structure, building on existing leading companies and/or the EnergySampo innovation ecosystem.*
- *In the longer term, the concept could evolve into a more institutionalised national network or model, depending on stakeholder interest and demonstrated impact.*
- *The key actors include energy ecosystem companies and research organisations in Ostrobothnia, with particular emphasis on EnergySampo, Energy Transition Valley, existing leading companies (Veturi) , and related co-innovation projects.*

Funding options

- *Initially RDI project funding from Business Finland (including co-funding from companies and research organisations), potentially as part of an ongoing Business Finland (Veturi) initiatives in the region.*

Concrete next steps:

- *Establish a project consortium and prepare funding applications for a joint RDI project.*

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

C. Regional regulatory experimentation zone

The experimentation could be implemented in the Ostrobothnia region but would require changes to national level legislation.

Taking into account the upcoming parliamentary elections in the first half of 2027 and the need for national-level regulatory reforms, the earliest realistic timeframe for establishing the experimentation zone is the first half of 2028.

Key objectives and deliverables

- *The experimentation zone is designed to explore market incentives – such as taxation models, tariffs, and electricity pricing mechanisms – for supporting renewable energy innovation and business models.*
- *As a longer-term opportunity, inspired by the GreenLab example could be expanded to include a dedicated testing zone or industrial park for large-scale demonstration and pilot projects.*

Added value for key stakeholders

- *The primary stakeholders: companies working with renewable energy solution in Ostrobothnia, public authorities, and regulators.*
- *For companies: opportunity to experiment new business solutions and models under real operating conditions and market mechanisms.*
- *For public authorities and regulators: opportunity to test regulatory approaches and to generate practical evidence for future national-level reforms.*

Implementation and roles of key actors

- *Establishing an industrial park similar to the GreenLab example could be based on existing regulation related to closed distribution networks (§11 in the Electricity Market Act, 588/2013) and would not necessarily need any changes to regulation as such .*
- *The Act already allows for the creation of microgrids, changes in electricity tariffs through the DSO, and automatically granted electricity market licenses for minor construction projects.*
- *Utilising these opportunities could deliver tangible cost and competitiveness benefits such as cheaper electricity through tailored DSO tariff structures or avoiding congestion hours through a microgrid. However, establishing such zone or microgrid would require substantial infrastructure investments, which are not considered realistic under current conditions.*

Concrete next steps:

- *As preparatory steps, it is recommended to first implement Modules A and B to build the foundations required for launching the experimentation zone in H1/2028.*

4. Proposed schedule and next steps

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Proposed schedule and next steps

Module	Next steps / Deliverables	Timing	Responsibility
A: Regulatory policy platform	Organising a network of experts and stakeholders & setting up regular events/meetings for 2026. Launching a research/study for policy recommendations.	First meeting in Q2/2026. Study results available by the end of 2026.	Regional Council of Ostrobothnia
B: Market acceleration	Setting up a project consortium and preparing funding application for a collaboration project.	Q2/2026; Project start H2/2026. Q1/2027: Pilot projects.	EnergySampo innovation ecosystem
C: Regional Experimentation zone	Building on lessons from Modules A and B to preparing foundations for the regional experimentation zone.	Target time frame for experimentation zone launch: H1/2028.	Regulatory policy platform (Module A)

ÖSTERBOTTENS FÖRBUND
POHJANMAAN LIITTO

Further information

Vesa Salminen, 4FRONT
vesa.salminen@4front.fi

Niklas Ulfvens, Regional Council of Ostrobothnia
niklas.ulfvens@obothnia.fi

Johanna Dahl, Regional Council of Ostrobothnia
johanna.dahl@obotnia.fi