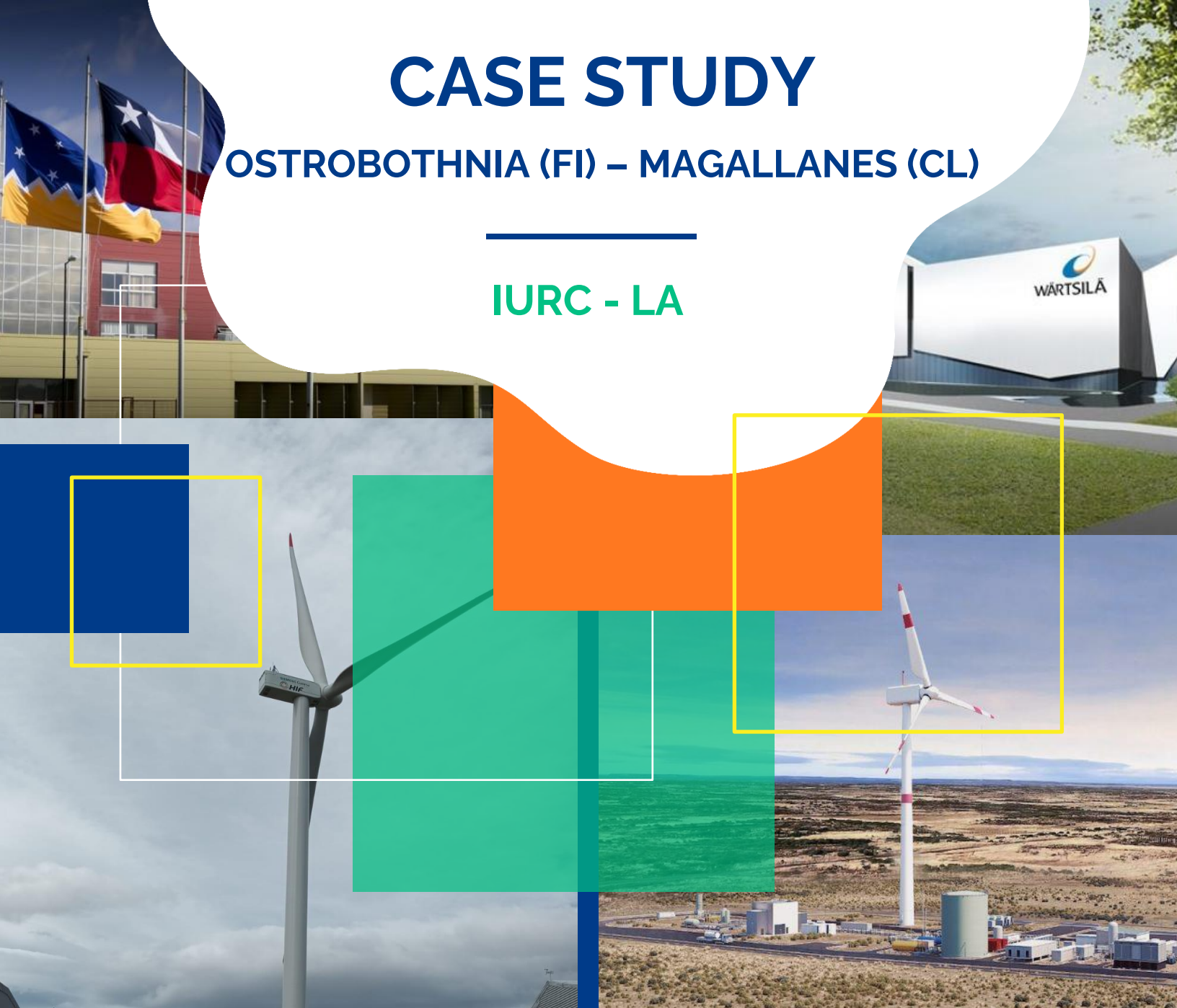


CASE STUDY

OSTROBOTHNIA (FI) – MAGALLANES (CL)

IURC - LA



JUNE 2023

Thematic Network(s): Ecological Transition - Green Deal

Thematic Cluster(s): Technologies 4.0

Cross-cutting challenge(s): Climate Change & Energy Transition

Topic keywords: green hydrogen, H2V, regional development, ecological transition

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OSTROBOTHNIA – MAGALLANES

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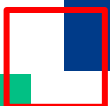
Ostrobothnia (Finland) and Magallanes (Chile) are exchanging best practices for the implementation of a hydrogen green ecosystem (H2V) in the Chilean region. Magallanes is a pioneer in this sector, through the local "H2 Magallanes" project, led by the French company Total Eren. Ostrobothnia has the necessary skills and capabilities to contribute to the implementation of the project and the creation of a regional H2 ecosystem.

EXECUTIVE SUMMARY

The Magallanes and Chilean Antarctica Region has unique characteristics that determine its development challenges and socioeconomic situation. The regional area (without considering the Antarctic territory) is similar to the size of Greece, but with a population of approximately 166,000 inhabitants (1,1 inhabitant / km²). Its unique location (between the Strait of Magellan and the Drake Passage) and climate with strong and consistent winds, create favourable conditions for the promotion of wind energy. The region also has low turbulence and wind shear, cold temperatures, and limited population density, which facilitates sufficient land for wind energy projects.

In this context, Magallanes has very favourable conditions to become a hydrogen hub. The H₂ Magallanes Project, owned by the international company Total Eren and located in the commune of San Gregorio, will have up to 10 GW of installed wind capacity, along with up to 8 GW of electrolysis capacity, a desalination plant, an ammonia (NH₃) plant and port facilities to transport green ammonia to domestic and international markets. Construction of the project is expected to begin in 2025, with hydrogen production following in 2027.

In the framework of IURC Latin America, Magallanes is currently working with the Finnish region of Ostrobothnia, which possess extensive experience in the development of green energy hubs, particularly in wind energy and biogas. Therefore, both regions are exchanging best practices that can contribute to accelerate the creation of the H₂ Hub in Magallanes.



MAIN CHALLENGE AND SOLUTION

The Magallanes region in Chile has the potential to become a hydrogen hub, producing and exporting green hydrogen from renewable sources. However, there are several challenges to overcome, such as the high costs of production and transportation, the lack of infrastructure and regulations, and the environmental and social impact of the hydrogen industry: there is uncertainty about the effect of numerous companies arriving in the region and the implementation of physical infrastructure that could be harmful to the environment, the need to produce large amounts of energy required for hydrogen, and the fear that the project might not be viable in the long term. To address these challenges, a collaborative and multidisciplinary approach is needed, involving public and private stakeholders, local communities, and international partners.

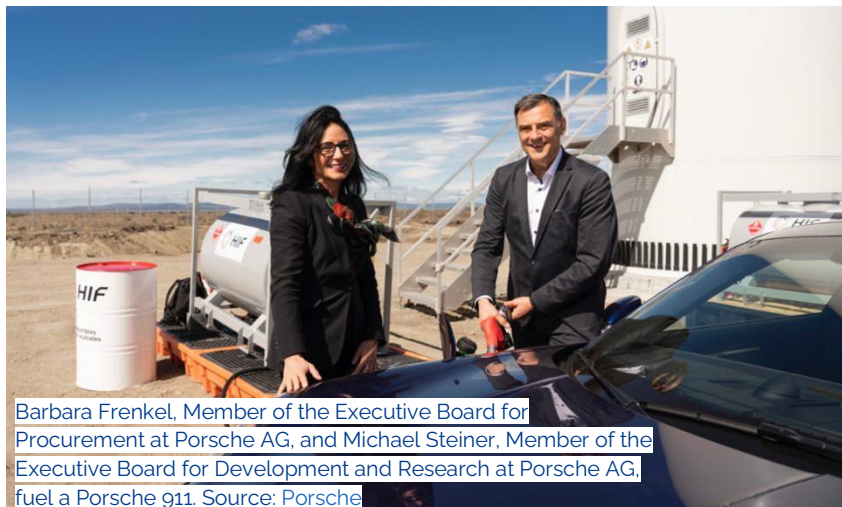
Ostrobothnia is contributing to tackle these challenges throughout its experience and good practices for the definition of models for centres of excellence, R&D and living labs for H2V, as well as other green energy sectors, such as wind energy. Ostrobothnia's support will help to accelerate the process of creating the hub and implementing the H2 Magallanes project, as well as to address the social challenges arising from the various changes that the project entails for the inhabitants.



As part of the project, Total Eren signed on November 10, 2021, a collaboration agreement with the University of Magallanes, a renowned public institution with extensive experience in the fields of engineering, environment, and social studies. This public-private partnership focuses on 3 main pillars:

- Environmental and social studies.
- Education.
- R&D.

Total Eren and the University of Magallanes (UMAG) will collaborate in the preparation of the environmental impact study and the Project's Citizen Participation Plan in accordance with best practices defined by the Participation Standards Guide of the Chilean Ministry of Energy. Novia University of Applied Sciences and University of Vaasa (both from Ostrobothnia) are also partners of UMAG in this process.



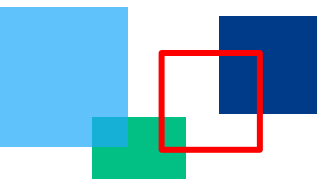
Barbara Frenkel, Member of the Executive Board for Procurement at Porsche AG, and Michael Steiner, Member of the Executive Board for Development and Research at Porsche AG, fuel a Porsche 911. Source: [Porsche](#)

Porsche is another of the companies involved in the project. Last December 2022, Porsche Executive Board members Barbara Frenkel and Michael Steiner performed the ceremonial fuelling of a Porsche 911 with the first synthetic fuel produced at the site. eFuels made from water and carbon dioxide using wind energy enable the nearly CO₂-neutral operation of petrol engines.

“Porsche is committed to a double-e path: e-mobility and eFuels as a complementary technology. Using eFuels reduces CO₂ emissions. Looking at the entire traffic sector, the industrial production of synthetic fuels should keep being pushed forward worldwide. With the eFuels pilot plant, Porsche is playing a leading role in this development”

- **Barbara Frenkel**, Member of the Executive Board for Procurement at Porsche AG.

ENAP (Chilean National Oil Company) is also involved in the project and will begin to develop its green hydrogen pilot in Magallanes in 2023, with production expected to start by 2025. To fulfil this purpose this year it will put out to tender, with a projection of approximately 18 months. The construction of the facilities, visualizing a reduced capacity of between 1 and 2 MW, energy which will be used in ENAP's installations and processes in the region. At the same time, the state-owned company will build a hydrogen loading yard.



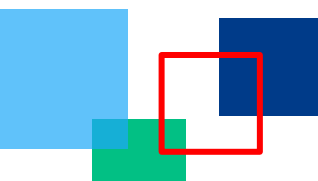
IURC Latin America connected the work of Magallanes with Ostrobothnia's universities and key regional innovation actors. The joint participation in networking events such as Vaasa's Energy Week 2023, the development of technical sessions and study visits made this possible. Furthermore, the regions submitted through their academic institutions (University of Magallanes, Novia University of Applied Sciences, and Hanken School of Economics) a joint application to Team Finland Knowledge, receiving an award for **64,800** euros to implement the project **“Wind-power to Hydrogen Interregional Synergies in Education and Research”**. The project will enable the creation of a course about wind energy and green hydrogen and support further collaboration and travel between the Regions.

As a result of their strong collaboration and additional funding, Ostrobothnia, which is home to the largest energy cluster and wind parks in the Nordic region, will continue their collaboration with Magallanes after the completion of IURC Latin America. Hanken School of Economics will support the development of a regional H2Ecosystem Roadmap, contributing to the development of new business opportunities related to green hydrogen. In addition, Ostrobothnia has invested in research and development activities to foster innovation in renewable energy technologies. Collaboration between local universities, research institutions, and industry partners will result to advancements in areas such as solar energy, energy storage, and energy system optimization. Novia University of Applied Sciences and University of Vaasa will continue involving the University of Magallanes (UMAG) for testing new approaches for the implementation of the H2 project.

Delegation of Ostrobothnia during study visit in Magallanes



The Ambassador of Chile to Finland and Estonia in the Energy Week developed in Vaasa (Ostrobothnia) - March 2023



RESULTS AND IMPACT

The H2 Magallanes project will use up to **10 GW of wind energy** to power up to **8 GW of electrolyzers**, a **desalination plant** and an **ammonia plant**. The green ammonia will be transported through port facilities to domestic and international markets. The project will **avoid the emission of up to 5 million tons of CO₂ per year** and contribute to the **global energy transition**.

KEY FIGURES

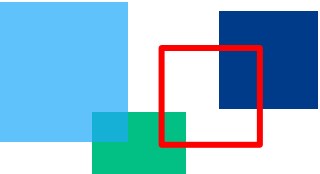
10 GW
Wind energy

8 GW
Electrolysis
capacity

5 mill.tonCO₂
Avoided annual
emissions



The expected structure of the future H2 Hub. Source: [Hidrógeno Verde Magazine](#)



LESSONS LEARNED

The implementation of a **sectorial hub** can help to **attract investors and companies, both national and international**, interested in supporting the development of new, sustainable, green energy sources. Proof of this is the investment made by **Total Eren, Porsche, and ENAP**, among many others.

By adopting sustainable practices and technologies, regions can reduce **greenhouse gas emissions**, improve **resource efficiency**, and create **new markets and jobs**.

The green transition brings opportunities for innovation, competitiveness, and social inclusion.

Cooperation activities contribute to increase the added value of an **economic and innovation approach**. **Ostrobothnia's experience and case studies** provided insights and demonstrated that the development of new sectors is not only feasible but can contribute to transforming the local industrial and productive matrix.

Public-private cooperation is a key factor for regional development. It allows the public sector to leverage the **expertise, innovation and resources of the private sector**, while ensuring that the **public interest is protected and promoted**. The **Regional Government of Magallanes** learned this and is focusing its efforts not only on attracting investments, but also on **preparing the region for the social change that this project promotes**.

THE IURC PROGRAMME

The International Urban and Regional Cooperation (IURC) programme enables cities in different global regions to link up and share solutions to common problems. It is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, as well as representatives of research and innovation, community groups and citizens. Through engaging in IURC, cities will have the chance to share and exchange knowledge with their international counterparts, building a greener, more prosperous future.

The IURC programme is an opportunity for local governments to learn from each other, set ambitious targets, forge lasting partnerships, test new solutions, and boost their city's international profile. Its activities will support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement.

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Acknowledgments:

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Giovanna Pinilla, University of Vaasa, Ostrobothnia

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Walter Ojeda, Head of Water and Grassland, DFOIN Magallanes

Links to related outputs:

Kaisa Penttilä blog and lessons learned from visit to Magallanes:

<https://www.iurc.eu/2022/12/14/read-the-fascinating-blog-of-otrobohtnias-experience-in-learning-about-renewable-energy-in-their-just-finalized-visit-to-magallanes/>

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