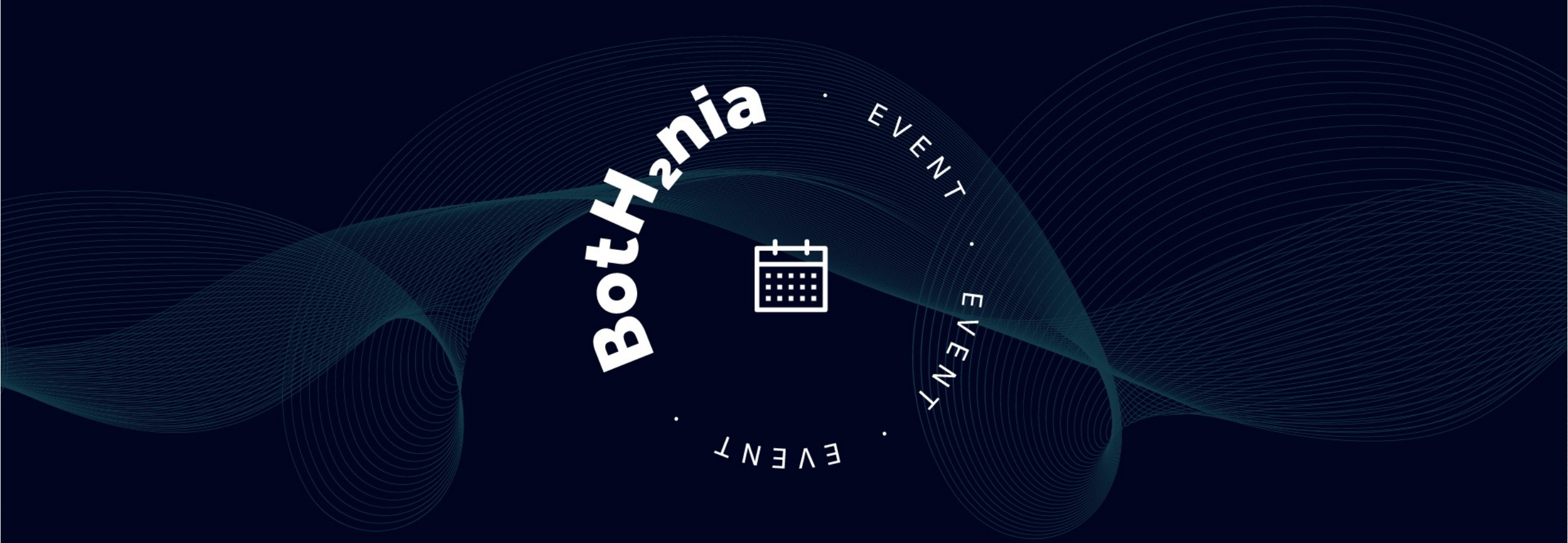
POHJOIS-POHJANMAA
COUNCIL OF OULU REGION



BotH$_2$nia goes Oulu & Raahe 5.–6.5.2022

This is a presentation given at the event Both$_2$nia Goes Oulu & Raahe on 5.–6.5.2022.

Both$_2$nia is a network of operators interested in hydrogen. The objective of the network is to create a Nordic hydrogen cluster around the Baltic Sea, beginning with the Bothnian Bay. Both$_2$nia strengthens the position of the north in the European hydrogen industry!

Both$_2$nia invites all businesses, research institutes, investors, municipalities and cities to roll up their sleeves for a greener future.

Please notice that the presentation has been modified to comply with the Accessibility Directive. In case for need the original material, please contact Minna Näsman (minna.nasman@both2nia.com).

Location survey for hydrogen production and storage

6.5.2022

Karoliina Markuksela

RAMBØLL

Bright ideas.
Sustainable change.

Contents

01 Introduction

02 The purpose and the background of the work

03 Location survey analysis

04 Detailed analysis for locations for hydrogen production and storage

05 Conclusions

01 Introduction

Pia Kautonen
Head of Unit

Karoliina Markuksela
Environmental Consultant

Antti Kumpula
Planner, Project Manager

Contact persons from City of Raahe:

Pasi Pitkänen and Anu Syrjäpalo

Ramboll in short

Ramboll is a leading design and consulting company for sustainable cities and societies. We offer innovative and sustainable solutions in the design, construction and maintenance of infrastructure, buildings and the environment, as well as management consulting.

- Founded in Denmark in 1945
- Owned by the Ramboll Foundation
- 300 offices in 35 countries
- In Finland 2 500 experts in 22 locations

02 Work background

The location of hydrogen production and storage as well as the operating conditions in the Raahe’s area were examined.

The purpose was

- To find suitable areas for hydrogen production
- To enable a carbon neutral industry

02 Work background

Hydrogen has the potential to significantly reduce greenhouse gas emissions e.g. in the transport sector and industry.

Projects and strategies supporting the production and use of hydrogen:

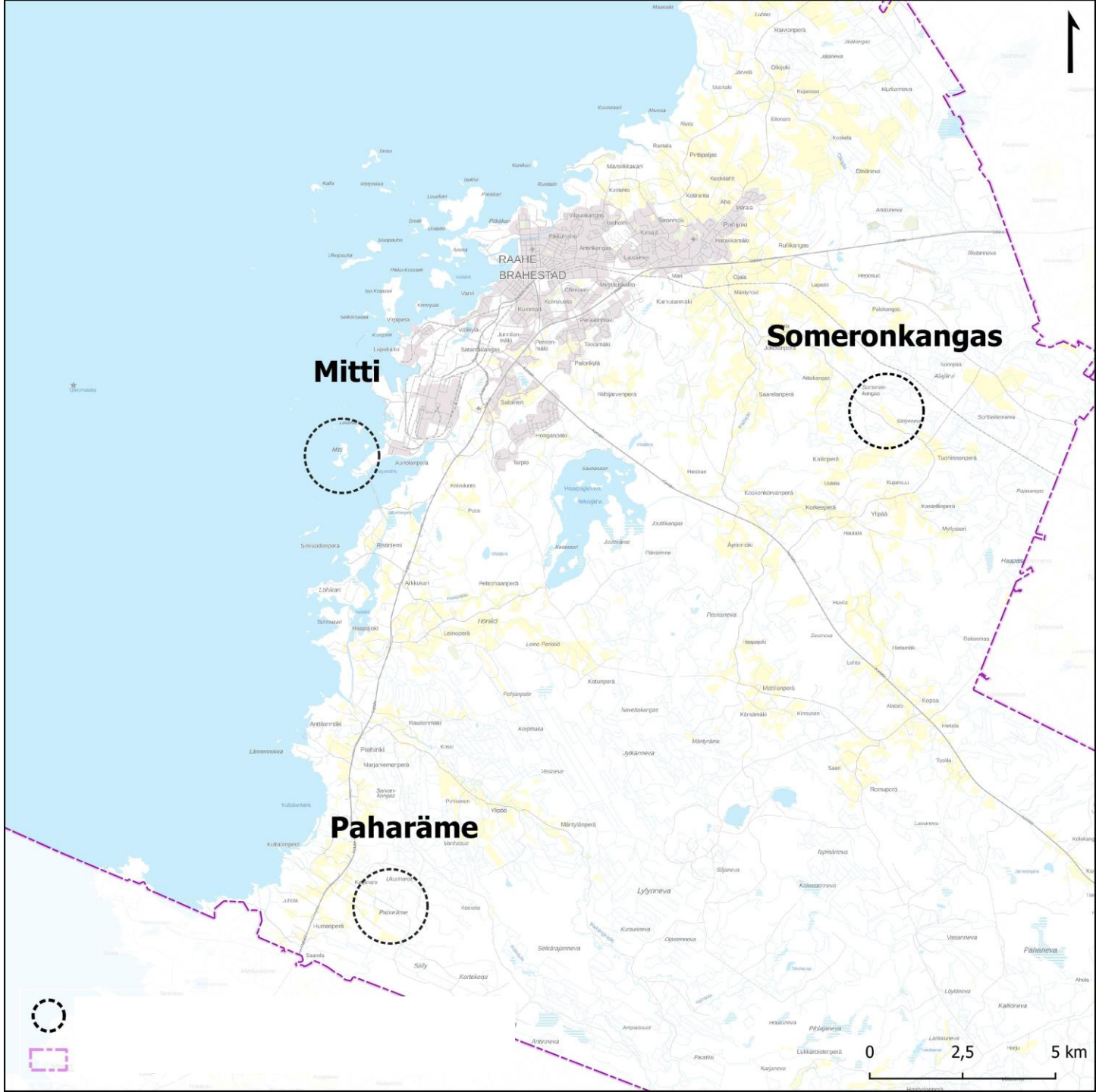
- European Union’s Hydrogen Strategy
- Finland’s Carbon Neutrality by 2035
- National Hydrogen Network project
- European Hydrogen Backbone –analysis

04 Detailed analysis for locations for hydrogen production and storage

The Someronkangas and Paharäme areas are suitable for both hydrogen production and storage.

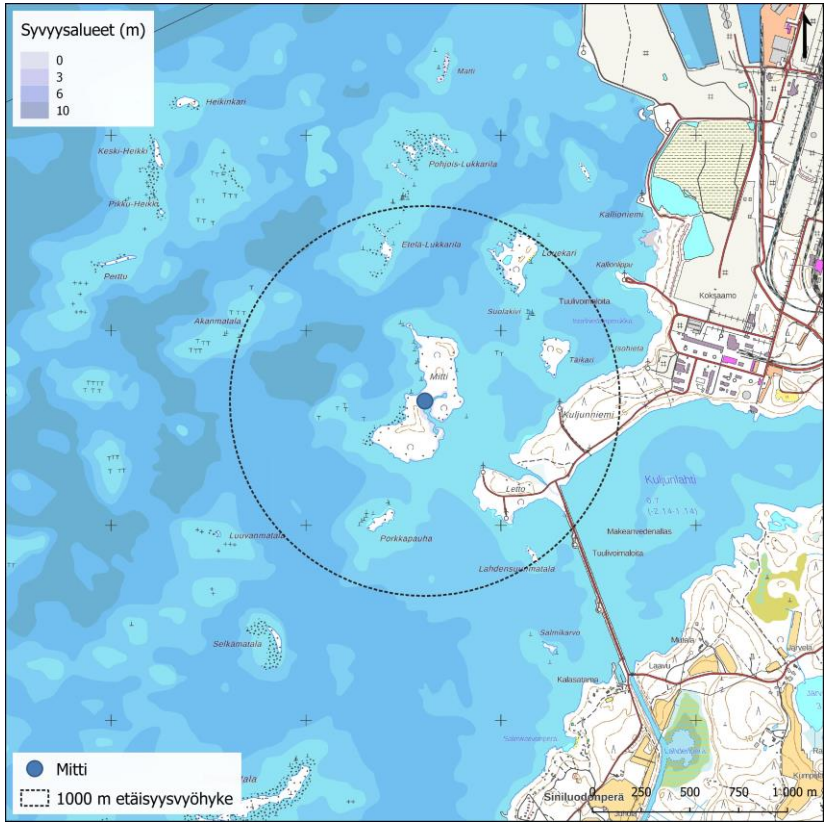
The Mitti area is particularly suitable for hydrogen production of its good location, for example in relation to the international hydrogen network.

The areas have good opportunities for the placement of hydrogen production and storage, even though safety requirements must be taken into account in the planning. In addition, safety distances to sites in the area, such as residential buildings, must be examined when the location is selected.



04 Detailed analysis for locations for hydrogen production and storage

Inspection area 1: Mitti



The area is located approx. 8 km from the center of City of Raahe and approx. 1,2 km from SSAB Raahe steel plant.

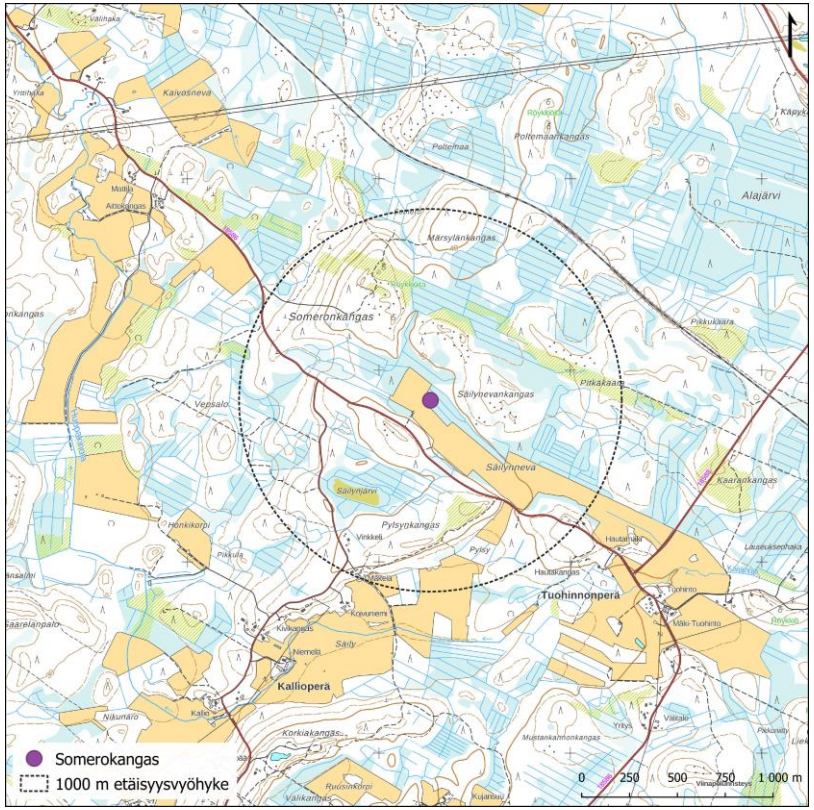
There are a few holiday buildings, buildings classified as other buildings and wind turbines in the area and nearby

The area is mostly flat in surface shape.

The shallow water area between the Mitti area and the Kuljunniemi area can be seen from the aerial view.

04 Detailed analysis for locations for hydrogen production and storage

Inspection area 2: Someronkangas

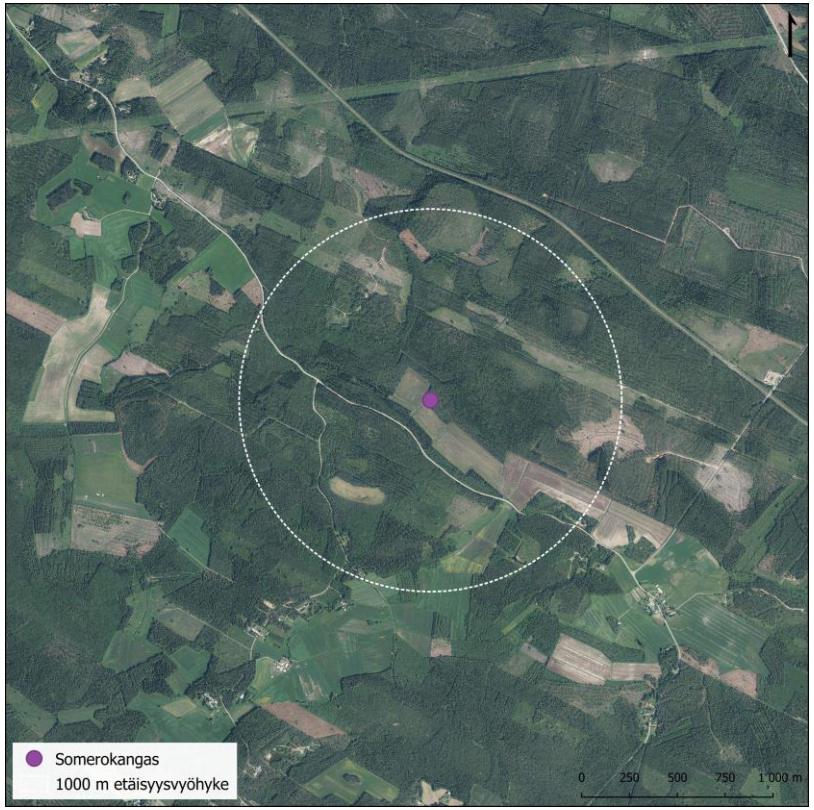


The Someronkangas area is located approx. 6 km from the center of Pattijoki and approx. 10 km from the coast of Bothnian Bay.

There are no existing buildings in the area. The nearest residential and other buildings are located approx. 750 meters away.

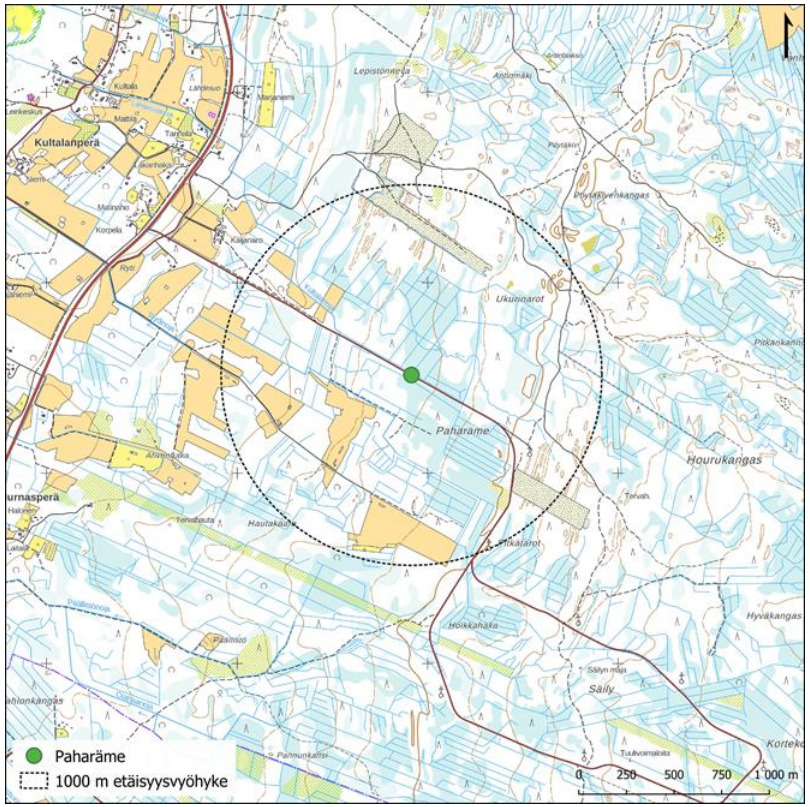
The area is varied in surface shape.

The area is mainly used for forestry and agriculture. Part of the area has already been modified e.g. into fields.



04 Detailed analysis for locations for hydrogen production and storage

Inspection area 3: Paharäme

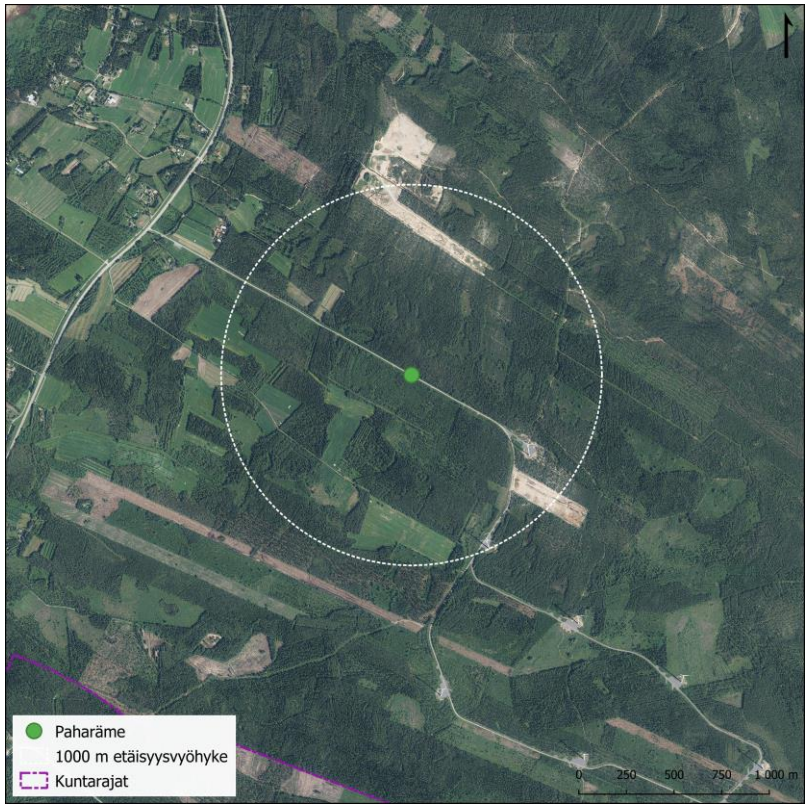


The area is located approx. 16 km from the center of City of Raahe and 11 km from the center of Pyhäjoki. The area is about 2,9 km from the the coast of Bothnian Bay.

There are no existing buildings in the area. The nearest residential and other buildings are located approx. 1 km away.

The area is flat in surface shape, but rises to the southeast.

The area is mainly used for forestry and agriculture.



05 Conclusions

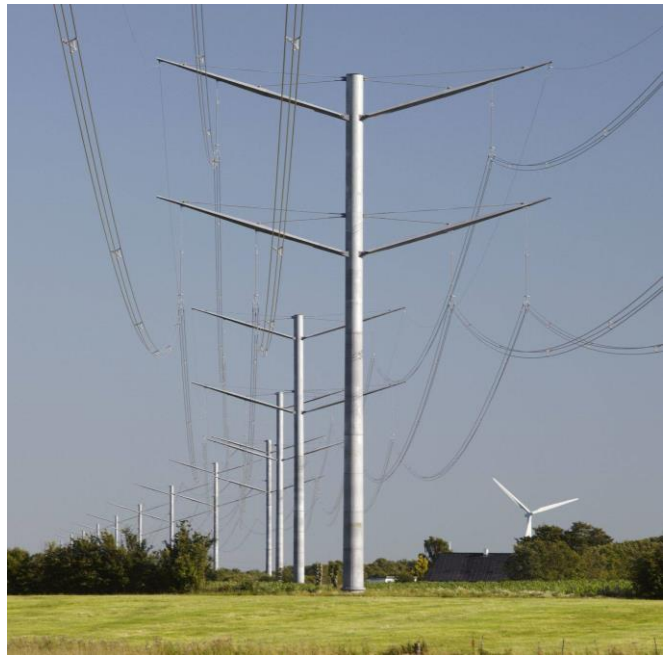
The Raahe area contains areas suitable for production and storage of hydrogen in terms of good location and sufficient area size.

As land-use planning continues, the need for more detailed inspection, such as environmental impact assessment, as well as other land-use requirements, such as zoning, should be taken into account.

In addition, safety requirements must be taken into account when planning the use of area, especially with regard to hydrogen storage.

Several project are underway in the Raahe area to produce carbon-free electricity and to strengthen the region’s electricity network, which contributes to the location of hydrogen production in the area.

Wind power operator OX2 is planning an offshore wind power project in the Finnisheconomic zone of Oulu and Raahe.



Thank you!