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offshore

Survey permitting offshore wind in Finland EEZ and Åland territorial waters

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Let’s just settle one thing first

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Overall status of Ilmatar Offshore

- Ilmatar Offshore Ab, registered in Åland, is a subsidiary of Finnish IPP company Ilmatar Energy Oy
- Not a project developer
- HQ in Mariehamn, Åland est. Q1 2022
- Core team recruited
- Ilmatar's targets for offshore wind development (OSW):
  - Deploy OSW along the Gulf of Bothnia, a pioneer in ice conditions
  - Create overseas spanning value chains and synergies between industrial, marine and energy sectors in Åland, Finland and Sweden
  - Establish the leading position as a Nordic independent power producer (IPP) within multiple renewable energy sources (RES) onshore and offshore wind, industrial-size solar PV-parks, energy carriers and storage e.g., batteries, **hydrogen** and ammonia

Ilmatar Offshore – plan in the Gulf of Bothnia

Permitting for all of Finlands regions is a ”3-in-1” know-how

1.
Finnish EEZ

2.
Åland territorial waters

Autonomy of Finland

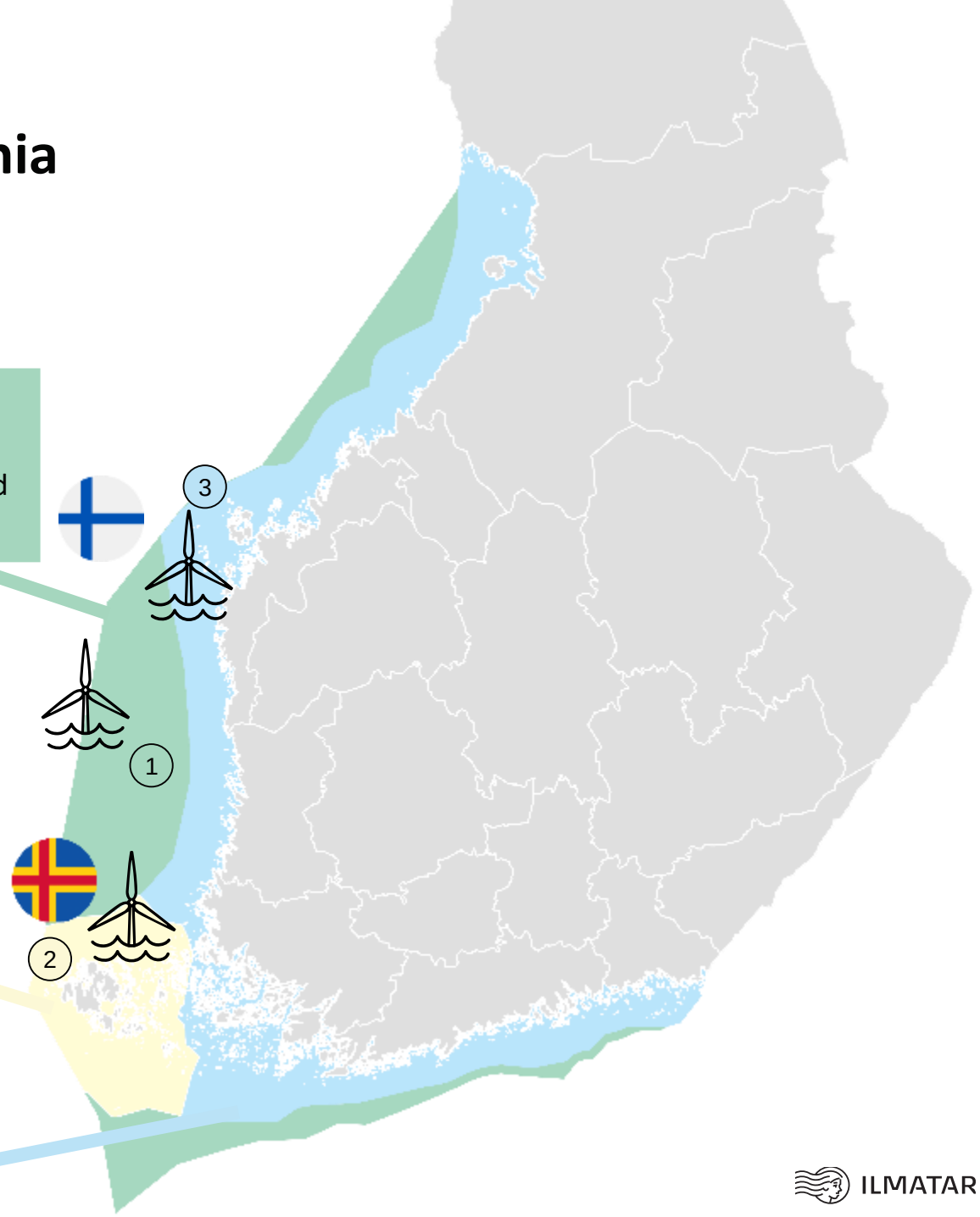
Ilmatar Offshore HQ

3.
Finnish territorial waters

EEZ is governed by Government of Finland

Åland TW is governed by the Government of Åland

Finnish TW is governed by the regions



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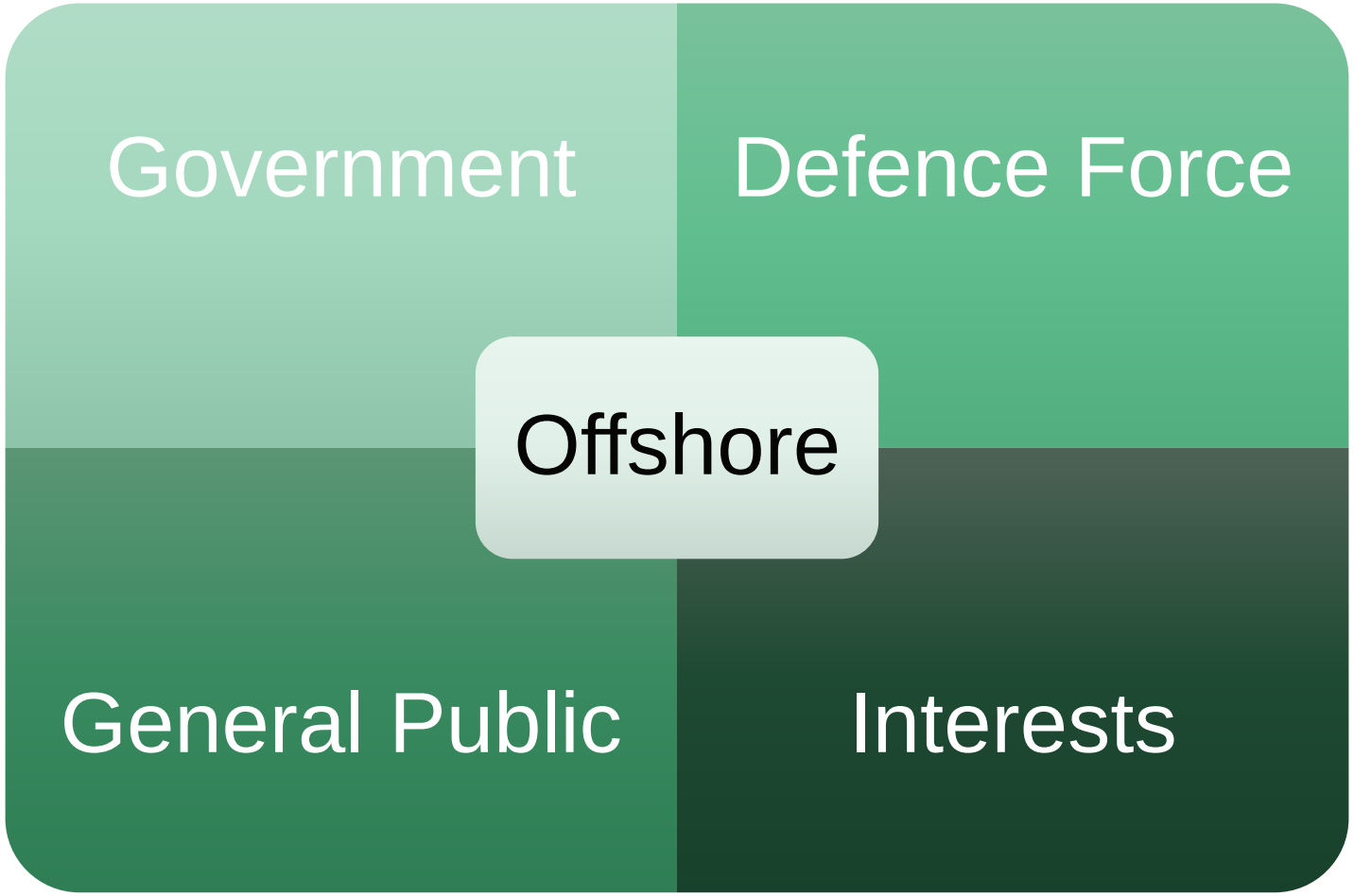
Offshore permitting
- A power struggle with no clear leadership



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Finnish Exclusive Economic Zone (EEZ)

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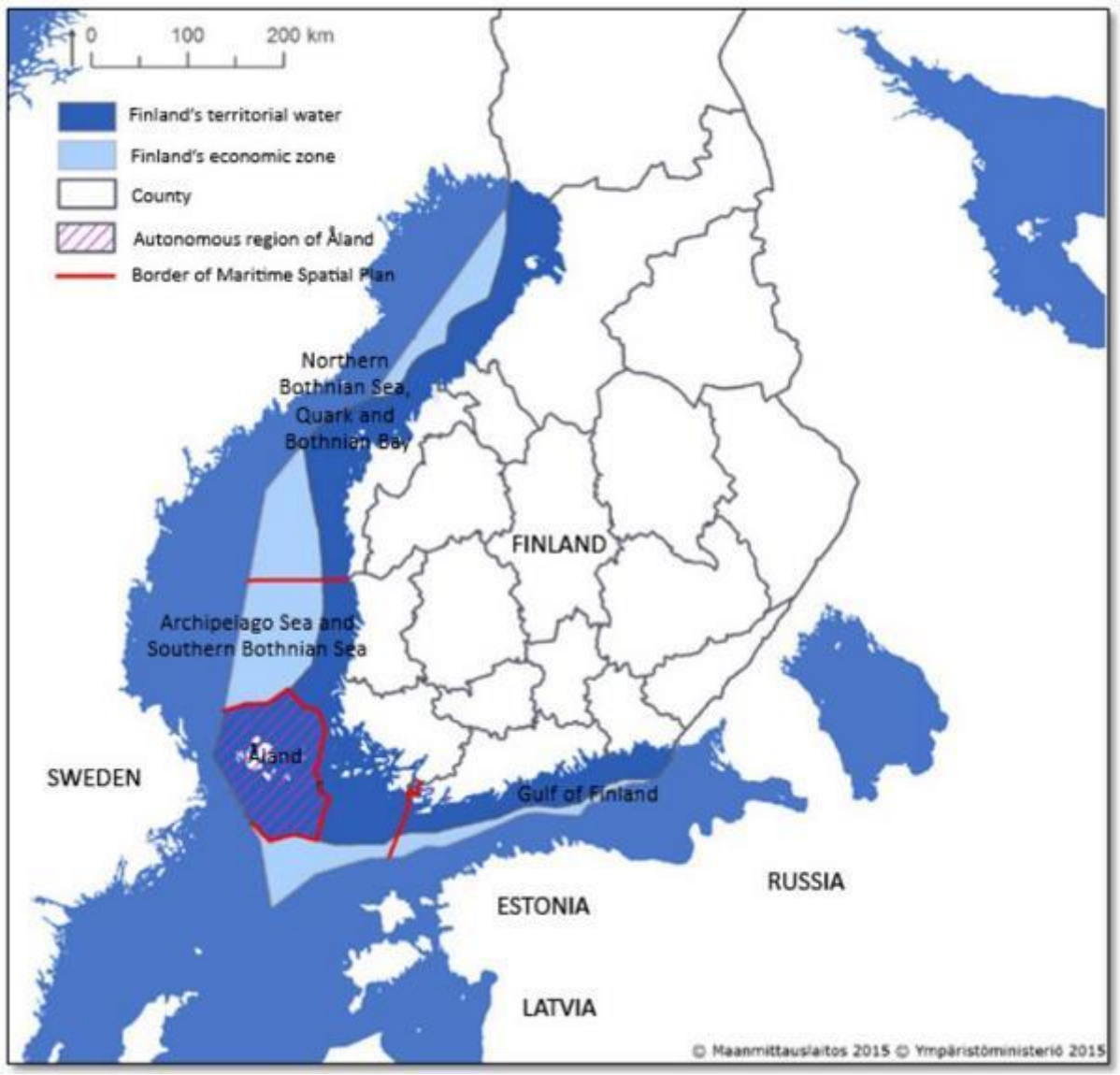
What is the EEZ?

In short

- The coastal state has the exclusive right to exploit all natural resources within this area.
- The economic zone was introduced to stop the growing conflicts over fishing rights, although oil extraction was also essential.
- Foreign ships and aircraft have the right to pass through the area under the coastal state's laws and to construct underwater pipelines.

  I.e. the laws and regulations for EEZ were not intended for anything other than cables and pipelines



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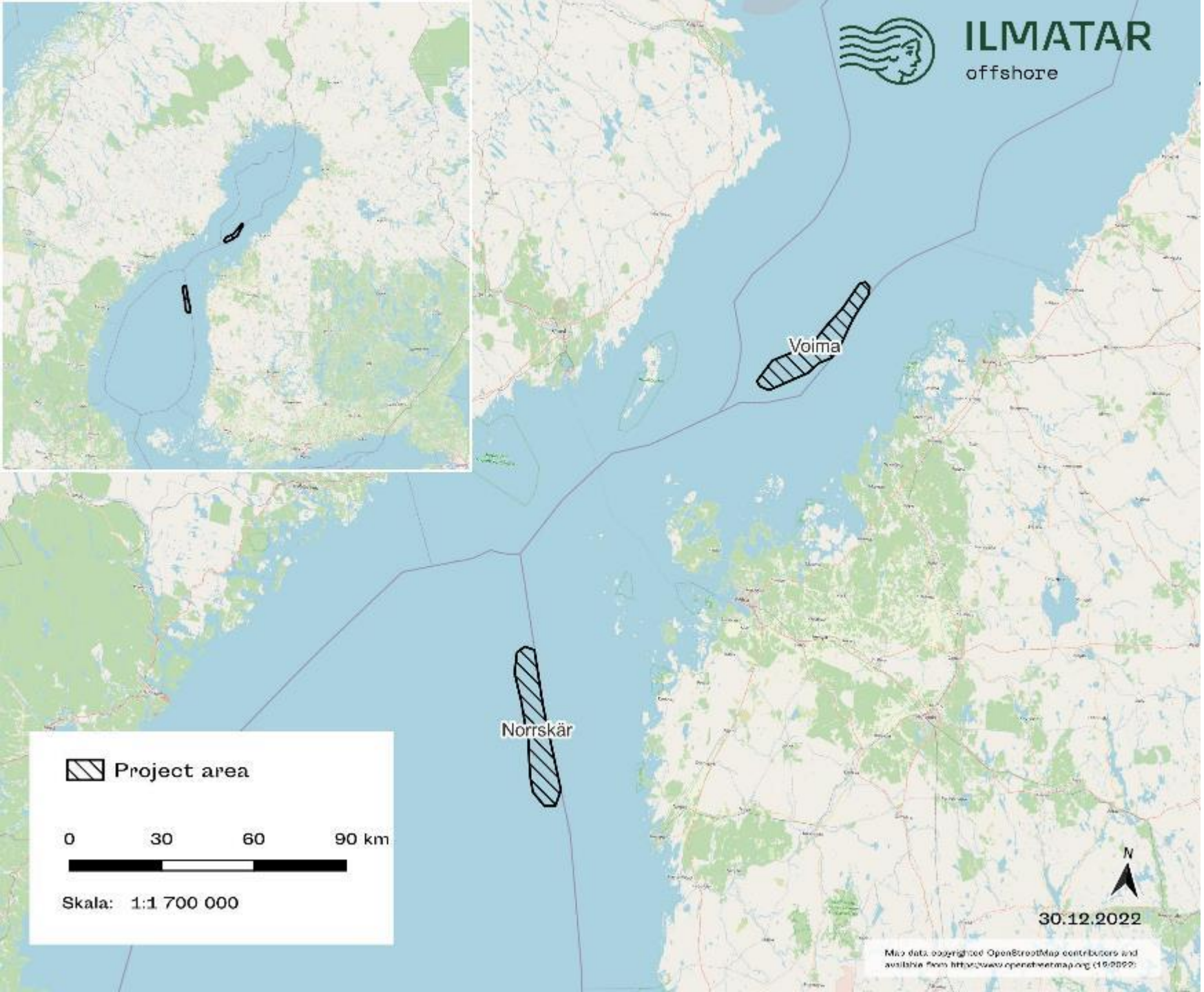


Voima & Norrskär

- Survey permit application submitted on 7 February 2022
- Positive project statements from Defence Forces on 5 April 2022.
- Survey permits granted Dec 2022.
- The decision to start surveys not been taken yet.

Project data

Voima

Total area: 323 km2.
Water depth range approx.
20-90 m. Estimated number of turbines: TBD.

Norrskär

Total area 389 km2.
Water depth range approx.
25-85 m. Estimated number of turbines TBD.

Stakeholders involved in permitting and hearing, Finnish EEZ – at a glance

A learning as we go process

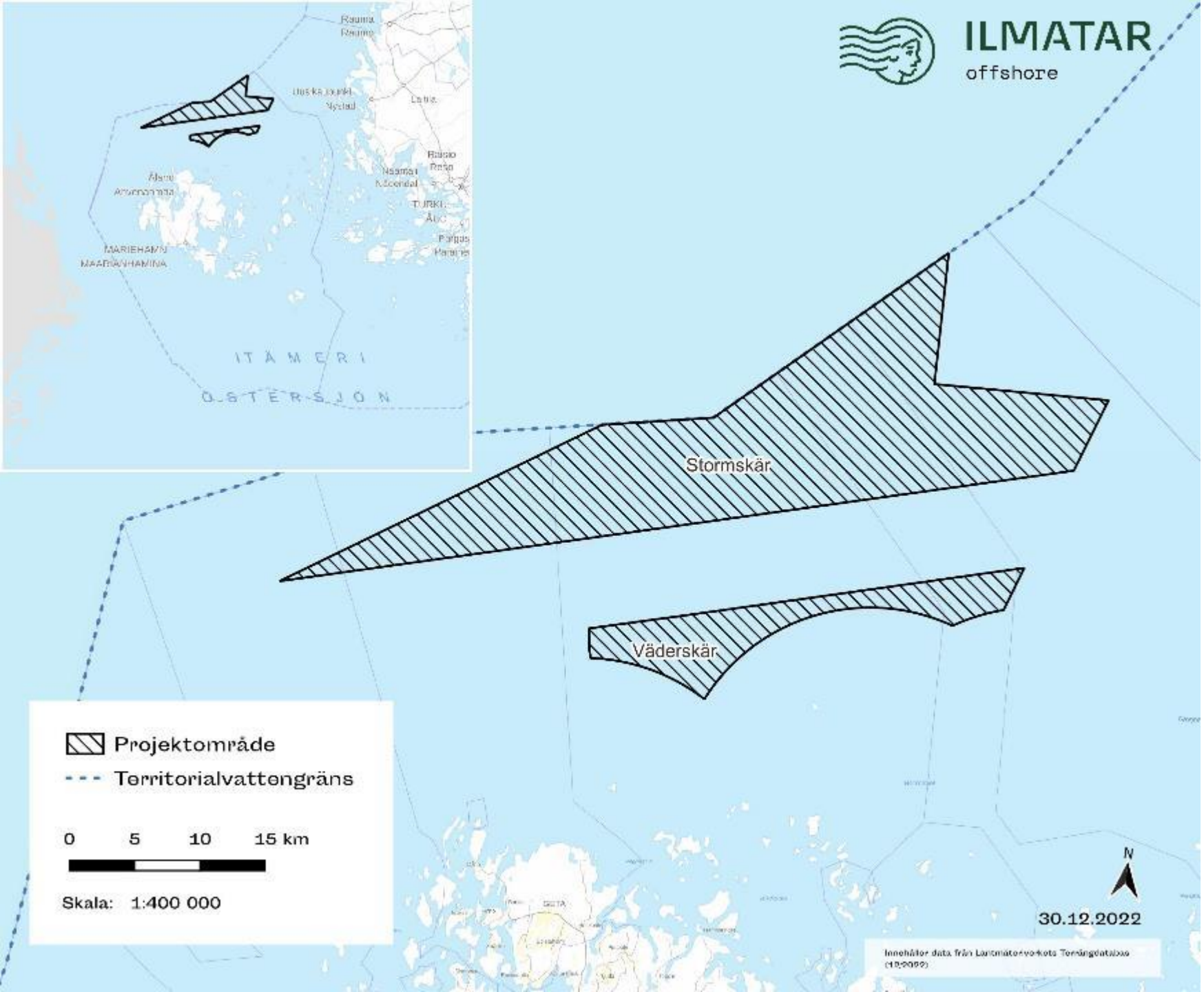
Ministry of Employment and the Economy	Regional State Administrative Agency	Regional EIA authority	Finnish Environment Institute, SYKE (Espoo Convention)	Municipalities (TW and onshore)
General Public	Defence Forces	Border Guard	Traficom	Finnish Infrastructure Agency
Finnish Meteorological Institute	Tele operators	Terrestrial broadcasts	TSOs AX, SWE, FIN	Responsible authorities in Finland/Sweden for subsea cables and shore stations

Åland Territorial Waters

Åland Islands

30.000 people & 6 700 islands and islets (but we only use like 70 of them)

- a Swedish-speaking autonomous province within the republic of Finland.
- has its own government and parliament, and extensive autonomy in areas such as education, healthcare, trade, and transportation.
- the right of domicile is a prerequisite for owning land and carrying on a trade in Åland.
- a demilitarized zone, as per the League of Nations' affirmation in 1921.
- a modern society with unique nature and culture, a strong maritime history, and good connections to both the east and west.
- the population of Åland is around 30,000, with the main town of Mariehamn having about 11,700 inhabitants and 15 rural and archipelago municipalities.



Stormskär & Väderskär

- Overall survey permit granted by Åland Government in the role of the owner of public waters 22.8.2022.
- Survey permit granted by Defence Forces to Arctia Meritaito on 20.9.2022.
- Surveys started by Arctia, Oct 2022.
- Ramboll contracted for EIA. Contract signed in Dec 2022.

Project data

Stormskär

Total area: 475 km2.
Water depth range approx. 10-80 m. Estimated number of turbines: 115.

Väderskär

Total area 96 km2.
Water depth range approx. 5-50 m. Estimated number of turbines 25.

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Stakeholders involved in permitting and hearing AX

Resources within the public sector are limited, as Åland has 30.000 inhabitants

Resposible agencies	Municipalities (16)	General Public NGO's & ENGO's Stakeholders	Åland Business Permit (Näringsrätt)	Åland Parliament & Government
Defence Forces	Border Guard	TRAFICOM	Finnish Transport Infrastructure Agency	Finnish Meteorological Institute
Tele operators	Digita Oy (Terrestrial broadcasts)	TSOs AX, SWE, FIN	Responsible authorities in Finland/Sweden for subsea cables and shore stations	Espoo convention – Finnish Environmental Institute (SYKE)

Key messages and learning outcome

…so far

- Framework for procedures and key stakeholders not in place
- No clear leadership in who owns the question / who's in charge
- Paves the way for misconceptions and miscommunication – no one is held accountable or given lead in driving the question
- Multiple actors survey the same sea beds and perform EIA's without guarantees
- How exclusivity is gained not settled – High risk of fincancial losses
- Permit to survey granted by Governments only if Defence Forces has given theirs
- A permit to survey does not equal "*first come, first serve*"

- If one is not in the game from the start, you risk being left behind

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Ilmatar Solar AB

Swedish Solar a lawless land

Big PV-parks hard to handle within the Swedish environmental code

- The environmental code was adopted in 1998 and entered into force 1 january 1999
- It is has replaced 15 other different laws such as:
- Environmental law
- The law of nature preservation
- Several water laws
- Several laws regarding farming and chemicals

Why is it hard to handle?

- Solar parks was not even thought of when the environmental code was implemented
- Leaving a gap in the legislation
- Swedish EPA has been asked to give guidance, but as of now none has been given

How to get permits to build then?

- The county boards have been forced to push cases to the environmental courts to get guidance
- There are differences between different counties, which causes challenges

How to get the permits then?

- Using chapters of the environmental code that is meant for other things
- Chapter 12 and/or chapter 9

Chapter 12. Agriculture and other activities

- Easy and fast questions like:
  - Forest roads on self owned properties
  - Cleaning of ditches in forest
  - Small gravel quarries for farms
  - The number of animals on a farm
  - Manure handling etc.
  - Can be overturned by local clerk
  - Doesn’t cover all aspects of the impact of the park

Chapter 9. Environmentally hazardous activities and health protection

The discharge of wastewater, solid matter, or gas from land, any use of land, buildings or structures that entails a risk of detriment to human health, or the environment due to discharges or emissions.

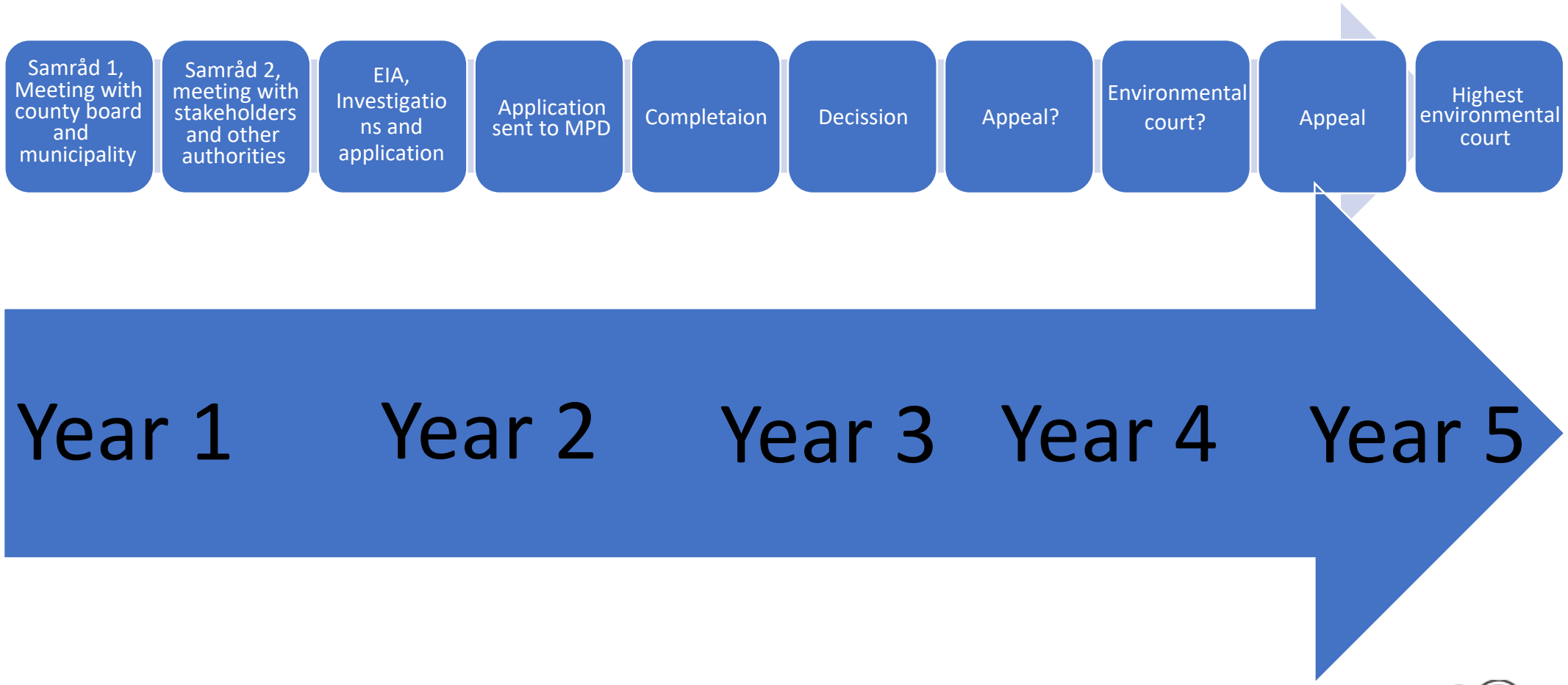
Any use of land, buildings, or structures that may cause a detriment to the surroundings due to noise, vibration, light, ionizing or non-ionizing radiation, or a similar impact.

When a solar park gets a permit according to chapter 9, all disturbance from the planned operation is examined beforehand and when the permit is given you are allowed to operate according to the permit. The permit is then valid for XX years and no complaining neighbor or local clerk can repel the permit.

The unofficial guidelines are instead :

- Solarfarms smaller then 5 hectares chapter 12
- Solarfarms bigger then 5 hectares chapter 9

Enough background lets look at the process



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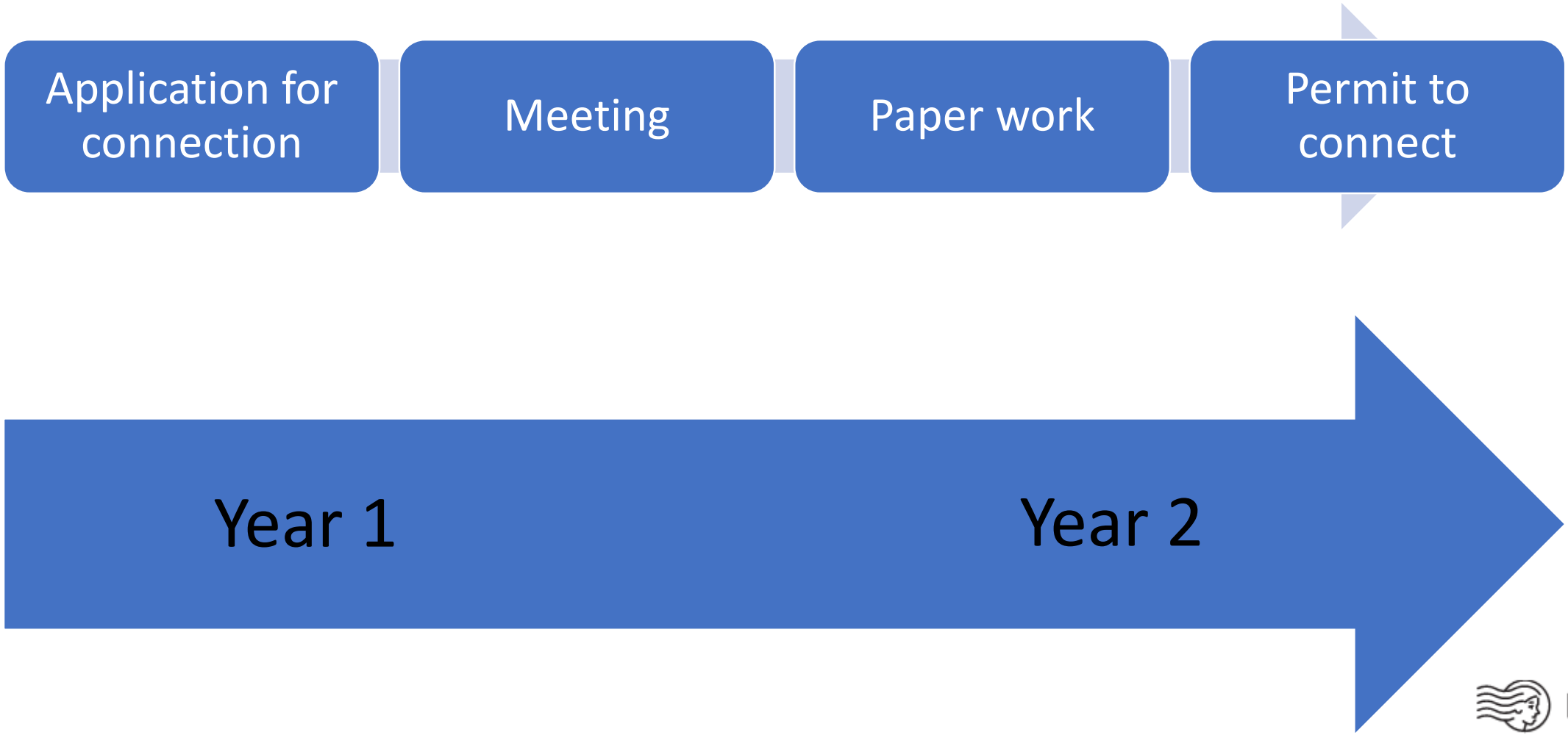
And then we have the connection process



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So how are we doing in general?

- In the application process we have 3 GW of solar-PV
- Chapter 9 permits

- And a small taste of that

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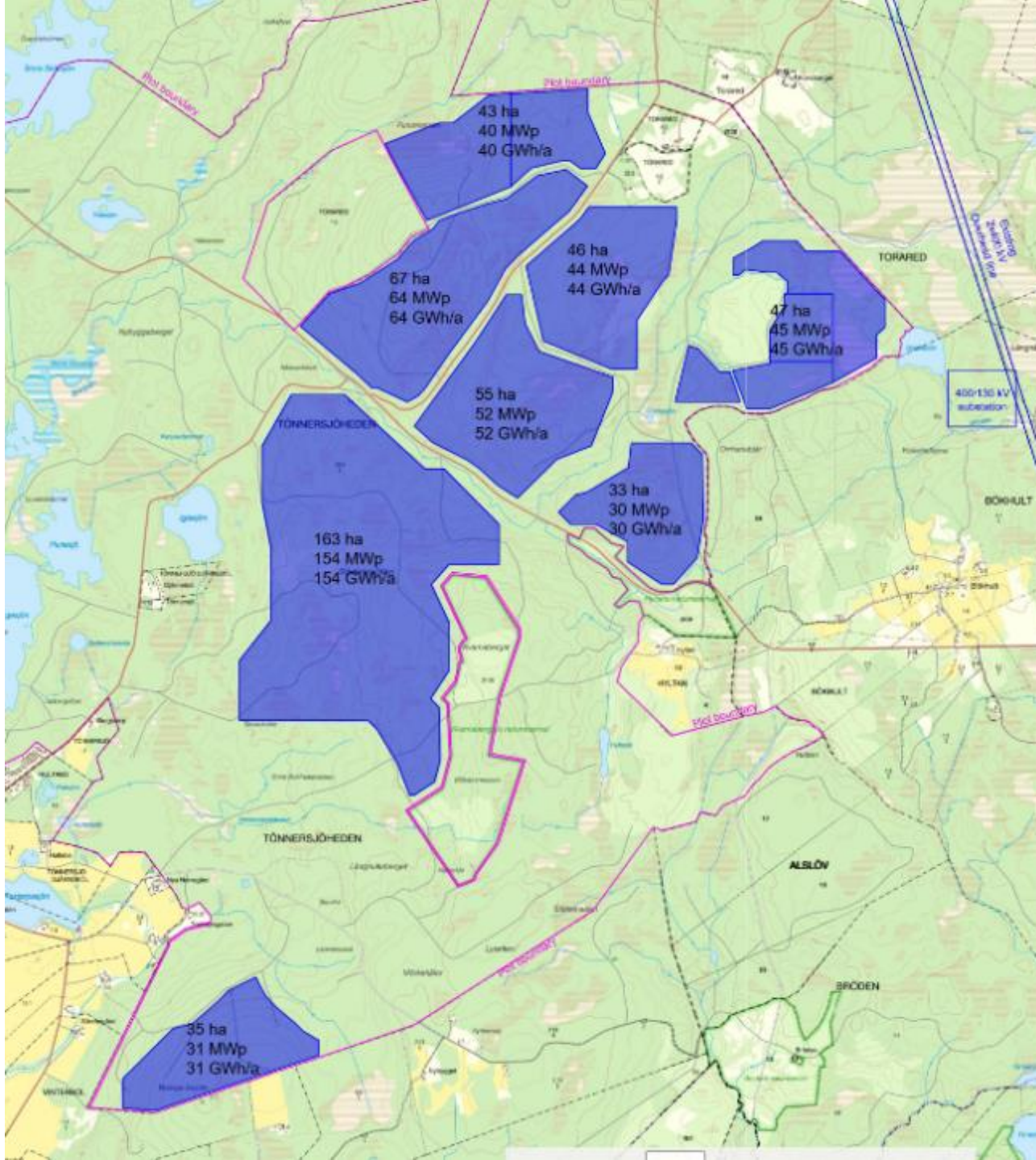
SE-Tönnersjö, 480 MWp

Key data	
Project name and municipality	Tönnersjö, Halmstad kommun
Coordinates	56°38'47.2"N 13°05'49.4"E, WGS84
Planned area	489 hectares
Capacity	480 MWp
Energy yield assessment	494 GWh/year
Grid connection	400 kV
Soil type and condition	Till
Soil studies	Q3/2022



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SE-Olivehult, - 509 MWp

Key data	
Project name and municipality	Olivehult, Motala
Coordinates Persköp, - MWp	58° 36’ 33.0084" N 15° 16’ 1.4232" E, WGS84
Planned area	510 hectares
Capacity	509 MWp
Energy yield assessment	509 GWh/annum
Grid connection	400 kV
Soil type and condition	Till, bedrock
Soil studies	Q4/2022

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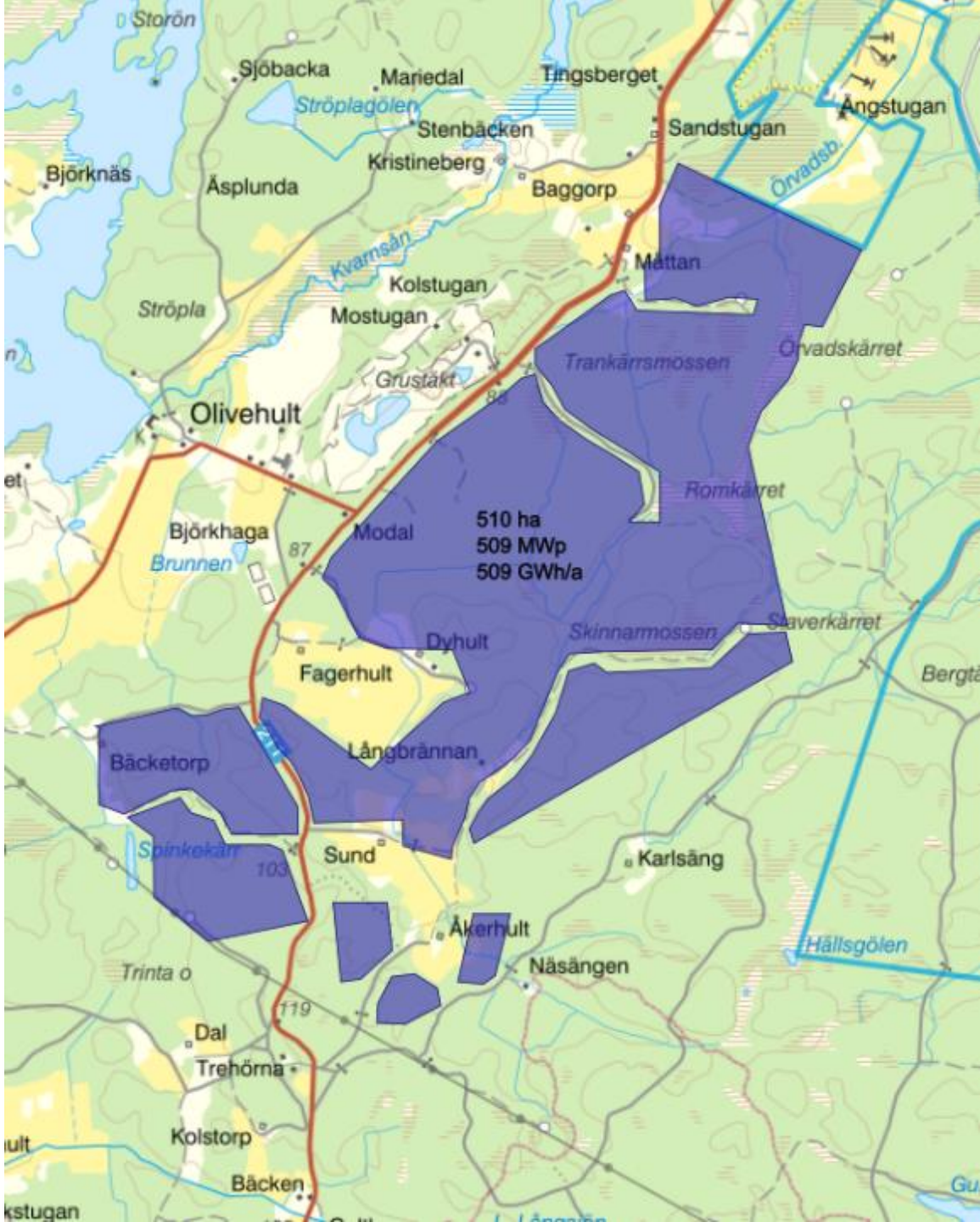
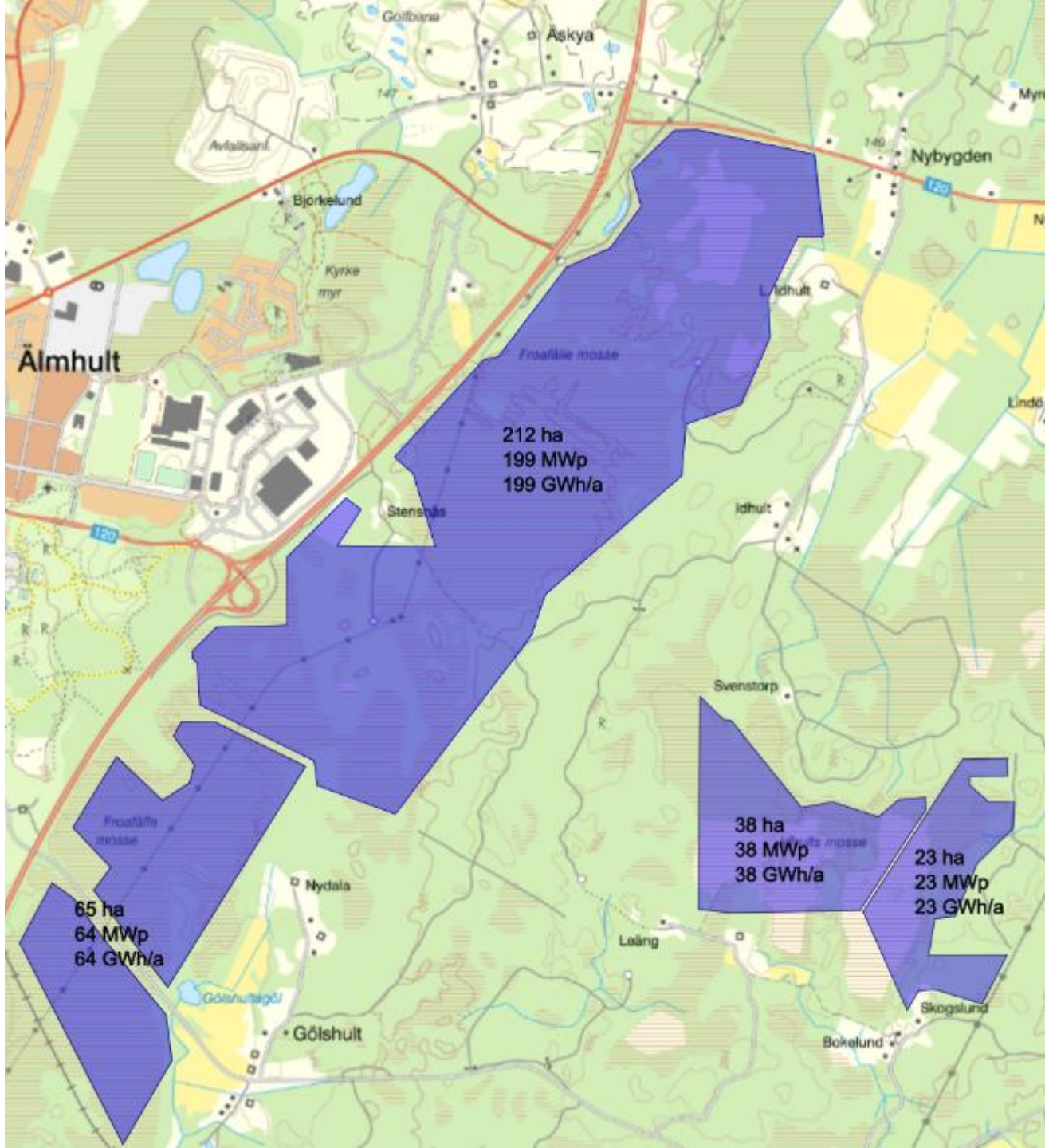


SE-Äskya, - 324 MWp

Key data	
Project name and municipality	Äskya, Älmhult
Coordinates	56° 33’ 53.7372" N 14° 10’ 40.0044" E, WGS84
Planned area	338 hectares
Capacity	324 MWp
Energy yield assessment	324 GWh/annum
Grid connection	400 kV
Soil type and condition	Till, peat
Soil studies	Q4/2022



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Want to be part of the future?

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solar

Tying it all together

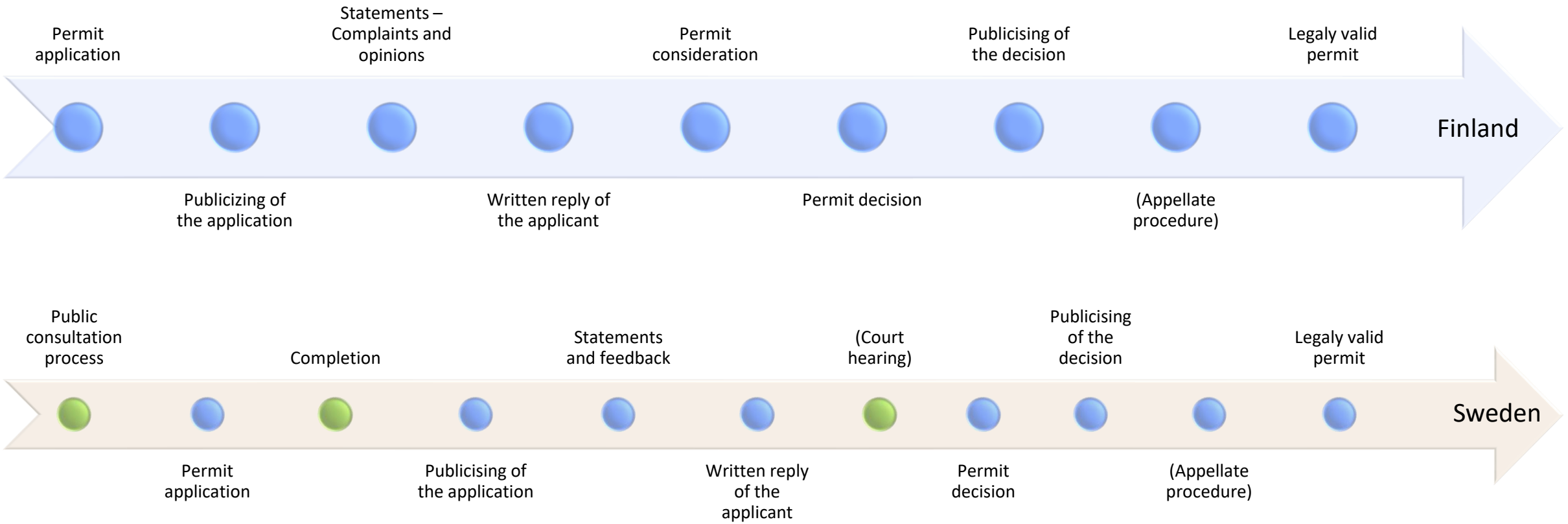
Permitting processes for hydrogen today and tomorrow

Linn Arvidsson | Sweco
Project manager multidisciplinary projects
Permitting specialist

What does a permit do?

- ✓ Sets the boundaries
- ✓ The basis for knowing what you want to do
- ✓ The basis for funding
- ✓ The basis for the engineers to do their magic
- ✓ All in all – the steppingstone needed to make it possible
- ✓ It is an incredibly cool place to be

Permitting processes – High level comparison



Now, let’s focus on the forest instead of the trees

Details differ between countries, but the overall idea is the same – Democracy

Details differ between countries, but the overall main process is the same – Step by step

- Identify the big impacts and reduce them
- Know before hand what to expect
- Include the concerned parties
- Provide the operator with framework that cannot be challenged later

What is so special about hydrogen permitting?

Formally

Nothing

In reality

It is a little world of its own

- ✓ New technology → does not fit into the system → have to go with the nearest fit
- ✓ New technology → the authorities do not really know what to ask for in the processes → a lot of less relevant questions tend to focus on less relevant things.
- ✓ Many hydrogen projects represent a step in the green transition → positive starting point
- ✓ Hydrogen is scary → ”the bomb”

We have passed the Hindenburg milestone!

- ✓ The formal framework has not changed much in resent years
- ✓ Still, the scene has changed dramatically

Five years ago

- ✓ Panic broke out when hydrogen was mentioned
- ✓ The attitude was sceptic, and the unspoken message was ”please go away”

Now

- ✓ It is a different starting point
- ✓ There ARE reference case, not that many but they exist

Future

- ✓ Learn from the LNG journey

What the future holds

Stationary plants on mainland

- ✓ More and more project and reference cases will come up making new projects less challenging

What are the next big challenges to solve?

- ✓ Offshore – no one thought of hydrogen production as part of the international legislation. The environmental protective legislation as a whole is insufficient here.
- ✓ Transportation in pipelines – The really blind spot legal wise. The rules present when it comes to pipelines and grid networks never considered hydrogen to be part of the scope.

What does it take to move the permitting and legislation framework forward?

- ✓ Projects
- ✓ Projects
- ✓ Projects

What the future holds

- ✓ Nothing will happen until there are enough actual industrial cases and investments to prove there is a demand for an update
- ✓ No talking will ever make any difference without action

So don’t wait for the change before getting started.
Drive the change by getting started.

At last – the survival guide for the hydrogen permit applicant

"If we possess our why of life, we can put up with almost any how"
Don't blame the system, act within it.

You want a speedy process?
Invest in it.
Time really is money.

Meet!
Preferably around a table, but at least on Teams or Zoom.

Listen humbly and be present.


SWECO
Transforming society together