Invest In Veitsiluoto

Continuation of the electricity network survey

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Effects of the amendment to the Electricity Market Act on the operating environment

- Legislative amendments in general
- Network operators
- Licence requirement for network operations
- Electricity neworks
- Definition of connection line
- Proposed reform of the Electricity Market Act
- Hybrid connections
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- Electricity network operators - granting a project permit & reform of the Electricity Market Act
- "Perämeren Energia Oy"
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- New 400 kV connection to Veitsiluoto
- Summary and next steps

Legislative amendments in general

Reasons and background to the legislative amendment

- Amendments to the Electricity Market Act are needed as business practices develop and the ways in which the grid is used change
- The old legislation prohibits, among other things, the use of shared connection lines and the distribution network company from building a high-voltage network, because it is defined as the main grid.
- It should be noted that the current legislation includes obligations if you own a 110-400 kV network, such as the development obligation

Fingrid and the development of the electricity network in Sea Lapland

- Fingrid has a great interest in developing the region's electricity network so that consumption could be increased to use a substantial surplus of production
- Fingrid's own development is slow → private investments in network development speed up the process
- Fingrid is interested in supporting network construction projects if another party starts implementing them

Electricity networks

- **The distribution network** is an electricity network with a nominal voltage of less than 110 kV
- The nominal voltage of **the high-voltage distribution network** is 110 kV
- **The main grid** is a nationwide uniform electricity transmission network consisting of power lines, substations and other equipment with a nominal voltage of at least 110 kV
  - The main grid includes cross-border interconnectors with a nominal voltage of at least 110 kV under the control of the transmission system operator.
  - Electricity networks and network parts with a capacity of more than 110 kV are defined as the main grid if they are not connection lines in accordance with the Electricity Market Act.
  - The transmission system operator must designate and publish the power lines, substations and other equipment in its main grid for the duration of each regulatory period: changes can be made to the designation during the regulatory period
  - The main grid and the distribution network may overlap geographically, as they mainly operate at different voltage levels and perform different tasks. The areas of responsibility do not necessarily follow municipal or regional boundaries, and the company's area of responsibility may consist of several geographically separate areas

Licence requirement for electricity network operations

- Electricity network operations are subject to a licence in Finland and throughout the EU
- Electricity network operations refer to making the electricity network available for a fee to those who need the transmission or distribution of electricity and other electricity network services
- The activities of the electricity network operator include, among other things, the planning, construction, maintenance, and operation of the electricity network; the connection of users' electrical equipment to the grid, electricity metering, customer service, and other tasks related to the transmission or distribution of electricity.
- Licensed electricity network operations do not include:
  - Connection line to connect one electricity consumption point or one or more power plants to the electricity network
  - Electricity network operations, in which the network only manages the internal electricity supply of a property or a corresponding group of properties (e.g. an industrial area owned by a single operator)

Proposed reform of the Electricity Market Act

- The move away from fossil fuels has rapidly increased the need for the consumption and production of electrical energy
- The old Electricity Market Act is not suitable for current needs
- The reform will be carried out in two stages: the Government has appointed working groups to prepare the reform

- **HE 197/2024,** Hallituksen esitys eduskunnalle laeiksi sähkömarkkinalain ja sähköntoimitussopimusten vertailuvälineestä annetun lain muuttamisesta (*Government Proposal HE 197/2024 to Parliament: Amendments to the Electricity Market Act and the Act on the Comparison Tool for Electricity Supply Contracts)*
  - Submitted 28.11.2024, Preliminary debate 12.2.2025, Committee consideration 13.2-19.3.2025, Report tabled 21.3.2025 → Plenary session 25.3.2025

  → separate amendment to the Electricity Market Act

- **Report of the Working Group on the High-Voltage Grid 18.12.2024**
  - Reference number: VN/13979/2023
  - Deadline for submitting statements: 26.2.2025
  - Estimated presentation week 17/2025

  → separate amendment to the Electricity Market Act ("High-Voltage Grid Government Proposal")

Key issues of the legislative reform – HE 197/2024:

- **Definition of connection line:**
  - A common connection line for several utilities (so-called hybrid connections)
  - The amendment would make it easier for the connecting party to operate, as the activity would no longer be subject to electricity network regulation

- **Clarification of the reasonable connection time**
  - The connection process would be faster in the future

- **Change in the project permit procedure:**
  - A project permit for a connecting line must be granted without without delay if the connection line does not cross the national border
  - Obtaining a project permit will become faster and easier, including for connection lines exceeding 110 kV

- **Changes related to invoicing**

Key issues of the legislative reform – Report of the Working Group on High-Voltage Grid 18.12.2024

- **Changing the definition of the main grid:**
- Parts of the grid with a capacity of more than 110 kV are not defined as the main grid, but as high-voltage distribution grids
- A distribution system operator can own and build a network of more than 110 kV

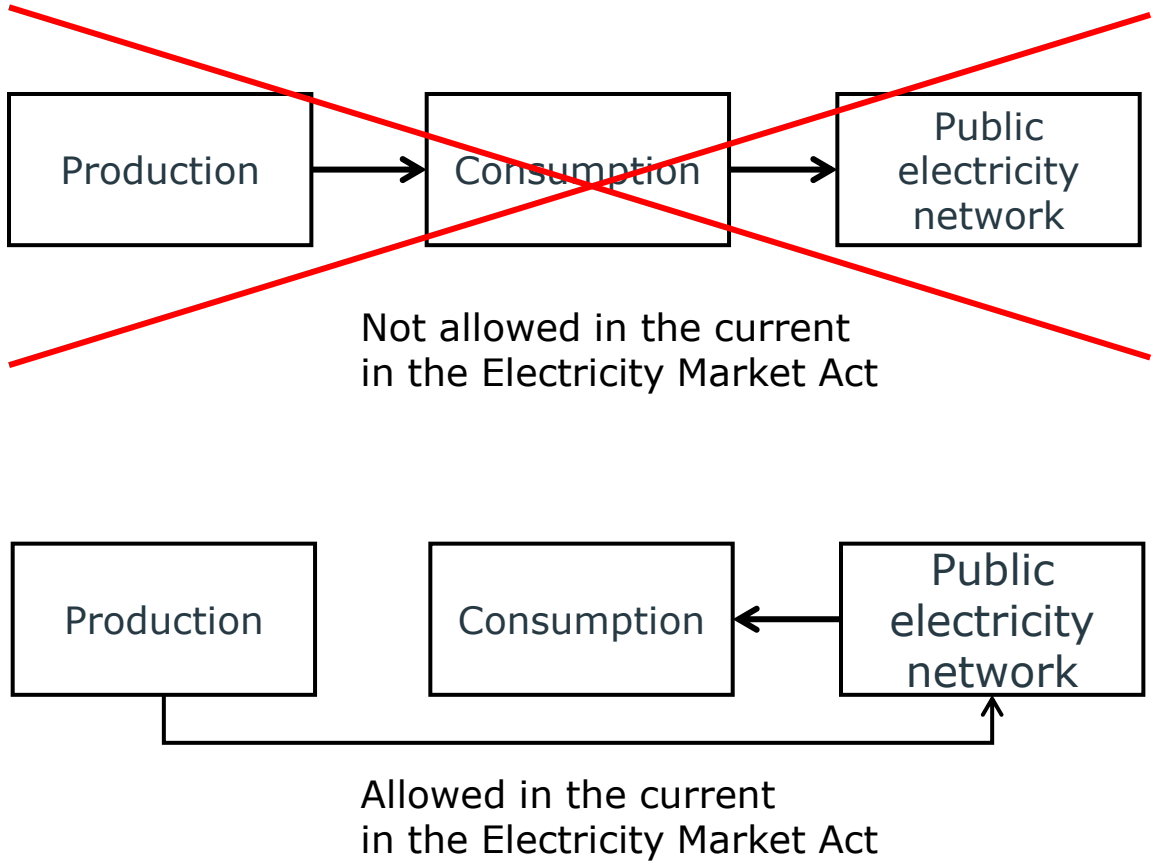
- **Changing and specifying the development and cost responsibilities between the transmission system operator and distribution system operators for interconnection lines exceeding 110 kV:**
- Changing the responsibility for the distribution system operator that has both a need for the interconnection line and an existing high-voltage distribution network within its area of operation

- **Consolidation of generation connection lines into a connection network at the 110 kV level or higher:**
- A reasonable return will be allowed for the connection network, and the definition of a connection line will remain unchanged
- The activity will not be subject to licensing in the future either
- the connecting party may still build the connection line themselves

- **Development of project permit regulation for power lines**
- There would be no need to apply for a project permit anymore, a permit granted automatically
- https://valtioneuvosto.fi/hanke?tunnus=TEM039:00/2023

Hybrid connections - Current situation

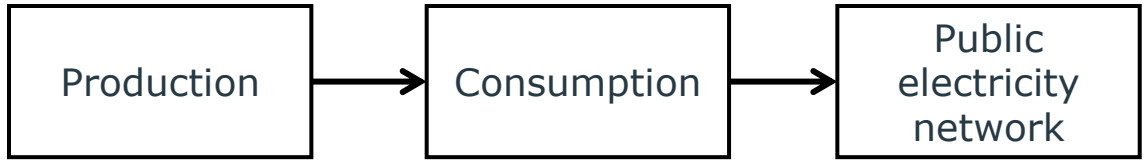
- Hybrid connections: electricity could be produced in one place and consumed in another without being routed through the public electricity grid
- The current Electricity Market Act does not allow production to be directly linked to consumption, but electricity must be routed through the public network
- The same applies to electricity storage facilities in connection with power plants
  - Increases grid load and the need for network investments



Hybrid connections – New law

- It is proposed that the Electricity Market Act be specified so that a configuration consisting of one or more power plants and one or more energy storage facilities connected to them could be connected to the electricity network with a common connection line
- The electricity equipment of the connecting party would not constitute an electricity network as referred to in the Electricity Market Act, and their operation would not constitute electricity network operations subject to a licence

- **The change would make it easier for the connecting party to join, as electricity network regulation would no longer apply**



Proposed to be allowed in the new in the Electricity Market Act

Electricity network operators - Connection obligation

- Upon request and for a reasonable fee, the electricity network operator must connect connections that meet the technical requirements to its network
  - The terms of connection and the technical requirements must be transparent, equitable and non-discriminatory
  - The terms and conditions must take into account the system's delivery reliability and efficiency
  - The obligation applies to both the connection of a new electricity consumption point or power plant and the change of the agreed transmission capacity in an existing connection.
- The network operator must publish the connection requirements, the terms and conditions of sale, the price lists and the criteria for determining the connection fees, as well as the reasonable time within which the network operator processes the requests for tenders concerning the connection
- At the request, the network operator must provide the connecting party with a comprehensive and sufficiently detailed estimate of the connection costs and an estimate of the delivery time of the connection.
- The connection of new connections must not be unnecessarily delayed due to insufficient transmission capacity.
  - However, when estimating a reasonable time, the time required for planning, permit procedures and construction must be taken into account

Reasonable connection time – legislative amendment HE 197

- The proposal would clarify the requirement for a reasonable connection time under the Electricity Market Act
- The network operator may have to carry out various network reinforcements and other technical measures depending on whether the electricity consumption point is connected to the main grid, a high-voltage distribution network or other distribution network.
- **Proposal:** Reasonable connection time 24 months in the main grid and high-voltage distribution network and 6 months in the distribution network
  - Exceeding the reasonable connection time is permitted only if required due to the scope or technical implementation of the connection, or for other specific reasons.
- The reasonable connection time could vary, and the maximum times mentioned could not be considered reasonable in all situations, but in some cases the reasonable connection time could be a substantially shorter period.
- The requirement for a reasonable connection time would continue to be assessed from the moment the connection agreement is signed.

- **The connection process would be faster in the future**

Electricity network operators - Development obligation

'The electricity network shall be designed, constructed and maintained in such a way that:

5) electricity consumption sites, power plants and energy storage facilities that meet the requirements may be connected to the electricity network."

- The legislative proposal states that, going forward, the transmission system operator would be responsible for the development of national networks, while the operator of a high-voltage distribution network would be responsible for the development of local or regional networks.
- A high-voltage distribution system is limited to its operating area, and the operating area can be located in the geographical area of any distribution network.
- For this reason, the development responsibility may also overlap in some cases. The operator of a high-voltage distribution network will continue to have the opportunity to build and operate the network within Finland's borders without geographical restrictions.

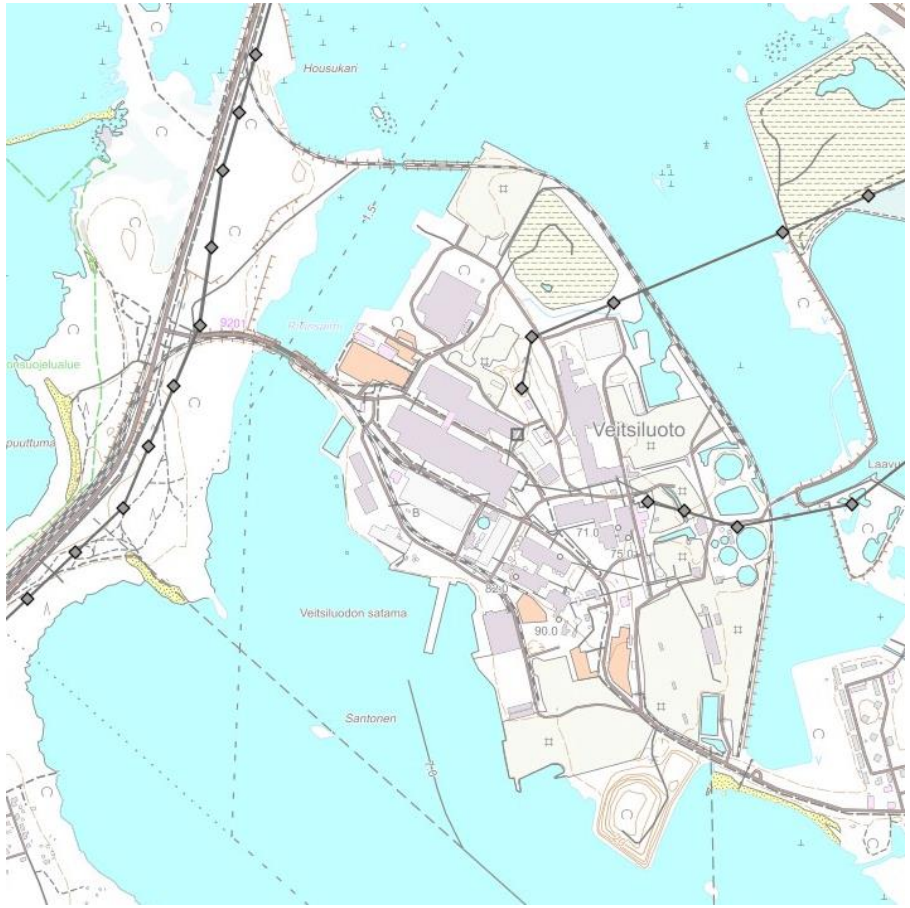
"Perämeren Energia Oy"

- Establishing a separate company to manage electricity distribution within the same property or group of properties
  - Owns and manages the transmission line and electricity connection
  - Distributes electricity to operators within the property or property group > does not require an electricity network licence
  - The company pays for the construction of the connection, maintenance costs and electricity transmission
  - The company distributes the costs of electricity transmission to the operators in accordance with a separate agreement (cf. apartment buildings, ports)
  - Each operator will have its own consumption point, so that electrical energy can be purchased from the operator of their choice
  - The prerequisite for operations is that the property remains unbroken

- **N.B!** The need for a permit for electricity transmission within a property or a group of properties must be clarified on a case-by-case basis with the Energy Authority! There is no established practice due to the rapidly changing operating environment!

Stora Enso's 2 x 110 kV to Veitsiluoto

- Transmission capacity 100 MW
- The sale of electricity lines is allowed: subject to negotiations with Stora Enso
  - The age, technical condition and need for replacement of the lines must be investigated: affect the price
  - The buyer and operator of the lines could be the above-mentioned "Perämeren Energia Oy"
  - Connection line serving a property or property group: several production plants or consumption points can be connected to the same 2 x 110 kV line



400 kV power transmission solution - General

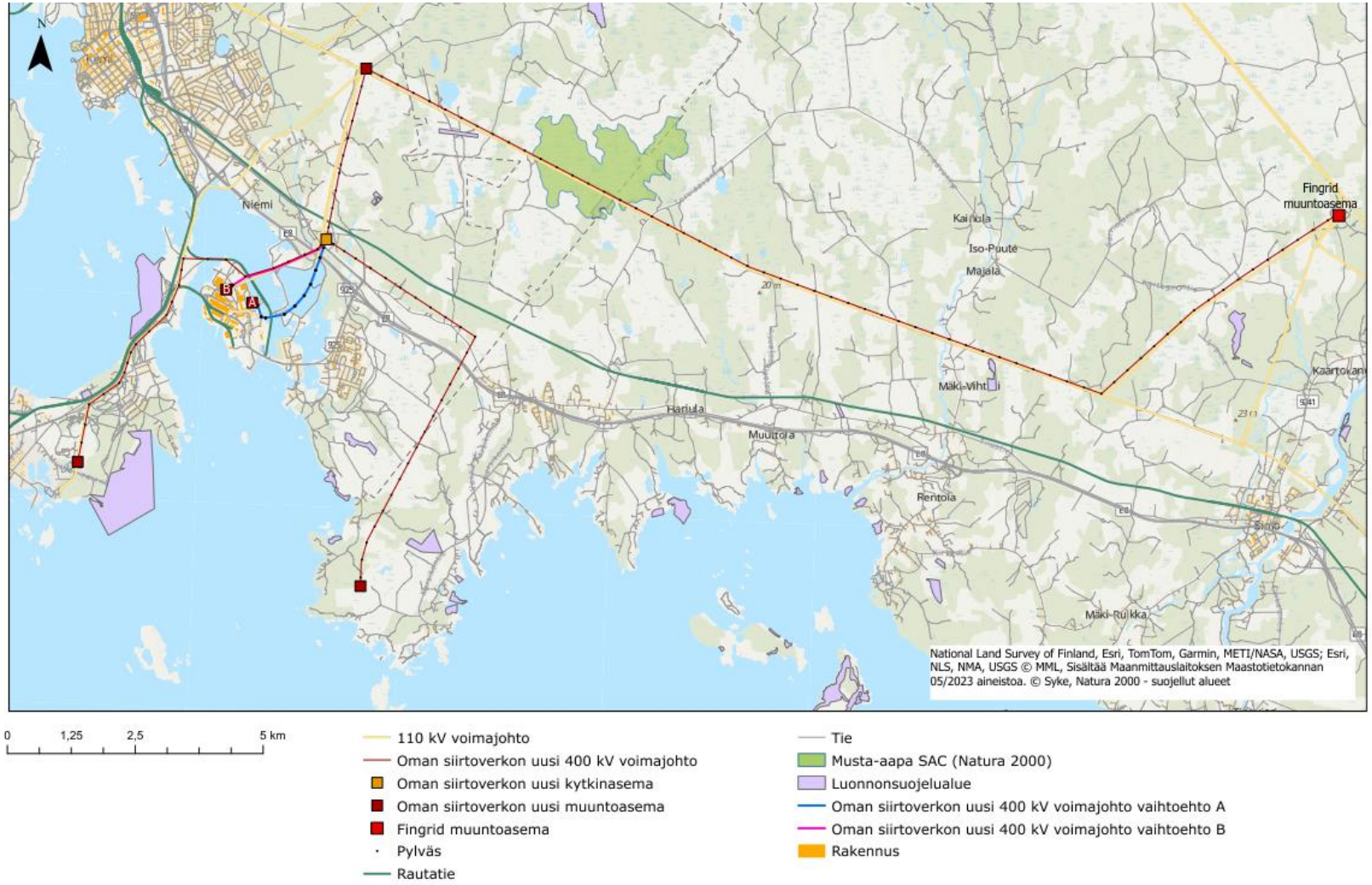
- Connection point Fingrid's 400 kV substation Simojoki
- The network to be built from Simojoki onwards is fully owned by "Perämeren Energia Oy"
- 400 kV overhead line connection Simojoki – Kemintulli
  - Two route options
- A new 400 kV switching station will be built in Kemintulli
- New 400 kV line branches will be built from the switching station to Karsikko, Kemi East, Veitsiluoto and Ajos

- New 400/110 kV substations
  - Karsikko
  - Kemi East
  - Veitsiluoto
  - Ajos
  - The final location of the substations will be decided separately

- The planned solution is not a ring connection: the maximum capacity of the supply line of 1300 MW is divided between all substations
- The implementation of the ring connection requires the construction of a 400 kV overhead line from Kemi East towards Taivalkoski and a new switching station

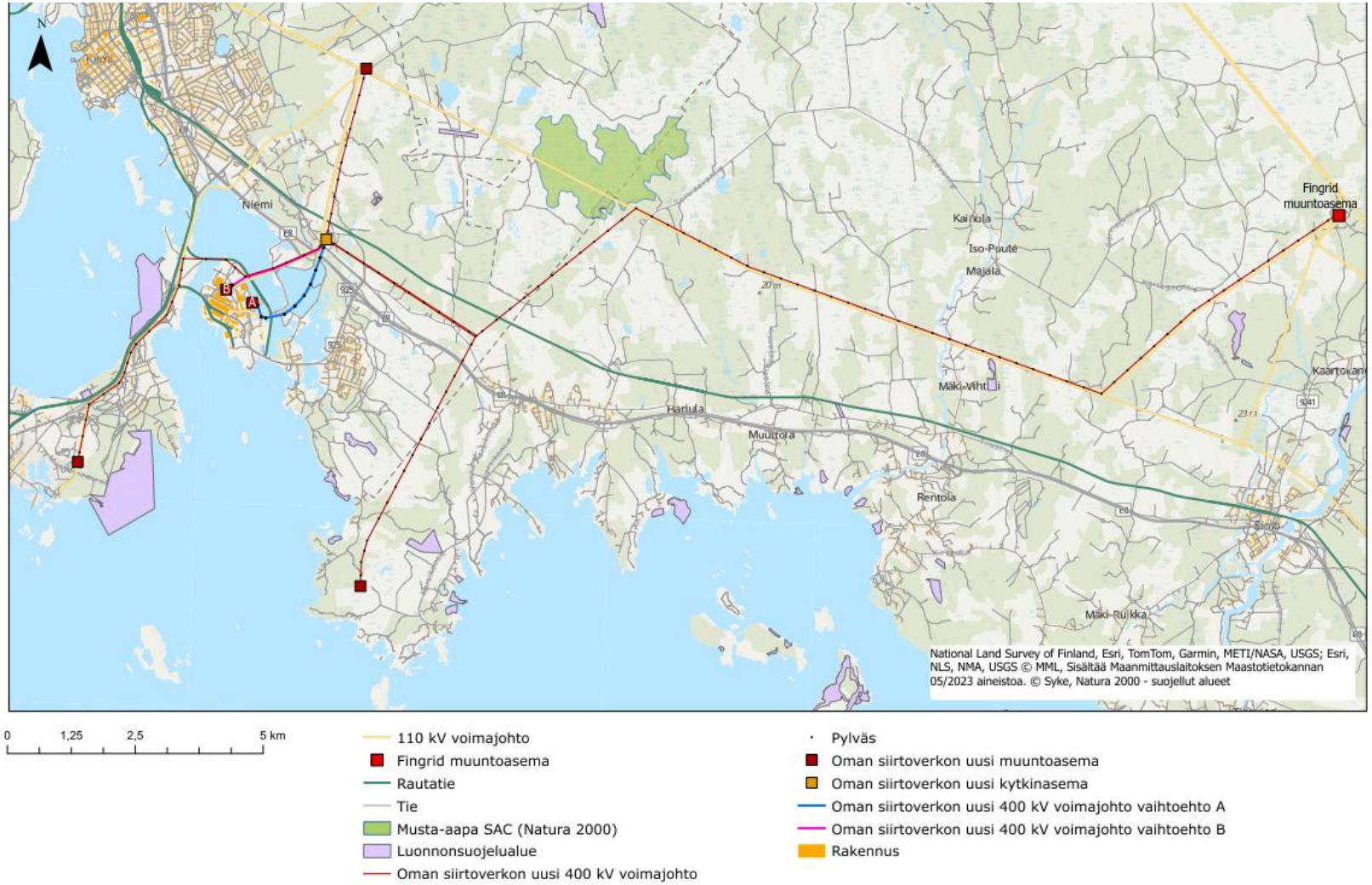
400 kV power transmission solution, option VE1

- The 400 kV overhead line will be built on the same line corridor as the Isohaara–Simojoki transmission line
- The total length of the line routes is about 40 km
  - About 8 km of completely new line corridor to be built



400 kV power transmission solution, option VE2

- The first part of the 400 kV overhead line will be built on the same line corridor as the Isohaara–Simojoki transmission line
- Before Musta-aapa the line turns southwest towards Karsikko
- The total length of the line routes is about 40 km
  - The Musta-aapa nature reserve will remain untouched
  - About 12 km of completely new line corridor to be built



400 kV Power transmission solution - Phasing

Phase 1: Simojoki – Kemintulli - Veitsiluoto

- Construction of a 400 kV overhead line Simojoki – Kemintulli
- A switching station will be built in Kemintulli or at least a space reservation will be made for the station
- Construction of a 400 kV overhead line between Kemintulli and Veitsiluoto
- A new 400/110 kV substation will be built in Veitsiluoto, with the readiness to extend the line to Ajos

Phase 2: Line branches

- Construction of the Kemintulli switching station, unless implemented in phase 1
- New 400 kV line branches will be built from the station to Karsikko and Kemi East
- From Veitsiluoto, the line will be extended to Ajos
- New substations will be built in Ajos, Karsikko and Kemi East
- The order of construction is determined by the development of the areas

Phase 3: Ring connection

- A 400 kV ring connection will be built between Kemintulli – Kemi East – Taivalkoski
- Depends strongly on the development of the region and the main grid
- Requires extensive coordination with Fingrid: construction time span ~10 years

400 kV Power transmission solution - Schedule

Phase 1: Simojoki – Kemintulli - Veitsiluoto

- The 400 kV overhead line Simojoki – Kemintulli requires an environmental impact assessment (EIA) and an expropriation procedure. **2-3 weeks**
- The 400 kV overhead line Kemintulli – Veitsiluoto is likely to require an expropriation procedure. **2-3 weeks**
- Design and construction of lines **2-3 years**
- **Construction of a 400 kV overhead line 3-6 V**
- Kemintulli switching station zoning, design, construction **1-2 years**
- Veitsiluoto 400/110 kV substation design, construction **2-3 years**
  - Delivery time of main transformers 2-2.5 years

Phase 2: Line branches

- The permit work for the 400 kV short line branches of Ajos, Karsikko and Kemi East should be started in advance: the construction work will take about a year

Investment costs

Phase 1

• Fingrid connection fee	2,3 M€ / pc
• 400 kV overhead line	12 M€
Simojoki – Kemintulli, 28 km	
• Kemintulli switching station	3 M€
• Veitsiluoto	400/110 kV
substation	20 M€ / pc
TOTAL.	**37 M€**

N.B!

- The price of substations depends on the power of the main transformers and the number of line outputs
- Network lifespan ~50 years

Phase 2

- 400 kV overhead line Veitsiluoto – Ajos 6 km

2.4 M€

- 400 kV overhead line Kemintulli – Karsikko 8 km

3.2 M€

- 400 kV overhead line Kemintulli – Kemi East 3 km

1.5 M€

- 400/110 kV substations 15-20 M€ / pc

400 kV connection to Ajos / Veitsiluoto / Karsikko / Kemi East

Ownership of the line

- Local regional network company after the amendment to the Electricity Market Act
- The existing electricity network licence enables the use of the line for the needs of several operators
- The owner has an obligation to connect, a network development obligation and an obligation to supply electricity
- Anyone can own a connection cable serving a single property or a group of properties

Line operation and control services

- 24/7 monitoring of the operation of the line
- Until now, 400 kV connections have been under Fingrid's control: Enersense has experience in operating individual connection lines
- The legislative amendment is likely to increase the demand for services and the number of operators in the future: e.g. Enerva and Caverion have expressed their interest in operating 400 kV in the future

Line construction and maintenance

- Construction, maintenance and fault diagnosis/repair readiness 24/7
- All network companies outsourced line construction contracting years ago, the operating models are established and there are numerous experienced operators available, such as Enersense and Eltel

Connection line vs. public electricity network

400 kV connection line

- Connection to a single consumption point or property/property group
- No electricity network licence required
- Distribution of electricity to different operators possible within the property/group (cf. shopping centre)
  - The owner can't connect external customers to their network
- The line may be owned by anyone
  - The owner is not obligated to connect other customers to its network or to develop the operation of the network

400 kV public electricity network

- The current Electricity Market Act allows this only for Fingrid
  - The legislative amendment also makes it possible for other electricity network companies
- Enables distribution to several different properties and operators
- Requires an electricity network licence
- The line owner is obliged to connect all willing customers to their network and develop the operation of the electricity network

Summary and next steps – 110 kV

- **Profitability calculation of the network investment**
  - Calculation of the depreciation period and the electricity consumption required in the area
- **Condition inspection of the line and substation**
  - Condition inspection to be commissioned for a 110 kV line and substation

- **Refurbishment plan for the line**
  - A plan must be drawn up, based on the condition inspection, detailing the necessary refurbishment measures and their cost estimates
  - Which actions need to be taken immediately, and which can be carried out over the next few years, in order to ensure continued use of the line until a more efficient connection is completed?

- **A decision must be made on the long-term future of the line**
  - Should it be dismantled or left as a backup connection?
  - Maintaining parallel 400 kV and 110 kV connections is not economically viable

Summary and next steps – 110 kV – no electricity network licence

- **Statement from the Energy Authority**
  - The permit requirements for an electricity network solution serving a specific area must be clarified with the Energy Authority
  - A connection line serving a single operator does not require an electricity network licence
  - If the line is intended to serve multiple operators within the area of a single property or a group of properties, the appropriateness of the arrangement and the potential permit requirement must be assessed in consultation with the Energy Authority

Summary and next steps – 400 kV

- **Selection of the project developer**
  - The operator to be selected to take forward the measures leading to the construction of the 400 kV connection
  - Will the task be handled by "Perämeren Energia Oy"?
- **Profitability calculation of a network investment**
  - Calculation of the depreciation period and the required electricity consumption
- **Preliminary plan for the transmission line**
  - A preliminary plan for the 400 kV transmission line and the necessary substations
  - Serves as a basis for EIA and land use negotiations
- **400 kV line operator**
  - Identifying a reliable operator(s) to take care of the operation and maintenance of the line
  - Will the task be handled by "Perämeren Energia Oy"?

Risks

- **Reform of the Electricity Market Act will not be implemented**
  - The Electricity Market Act will not be amended so that operators other than Fingrid would also be able to build and operate 400 kV networks
  - As a result, each operator has to build their own connection line (Note! Joint construction is possible)
  - Probability low, the proposed amendments have received broad support from various actors

- **400 kV line operator**
  - No operator can be found for the planned 400 kV network
  - The market is still in its early stages, and the expansion of 400 kV networks is likely to give rise to new operators
  - There is plenty of experience and expertise in the operation of 110 kV networks also outside Fingrid
  - Not a problem if the operator is "Perämeren Energia Oy" or other operator with an electricity network licence

Risks

- **Profitability of the network investment**
  - A 400 kV network investment cannot be made profitable or the payback period is considerably long
  - Strongly dependent on the amount of electricity used and the number of connections
  - The regulatory model of the electricity network does not favour the ownership of a short 400 kV line: the permitted transmission tariff depends on the network assets, among other things, and remains small in a short network
- **The chicken-and-egg problem of investment**
  - An investment that consumes electricity will not be made because there is no sufficient electricity network in the area;
  - On the other hand, a strong electricity network will not be built in the area, because no electricity-consuming investments have been made in the area
  - Promoting factors are investment-friendliness in zoning; the willingness of the local network company to make risk investments; positive attitude of the authorities towards permit processes

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