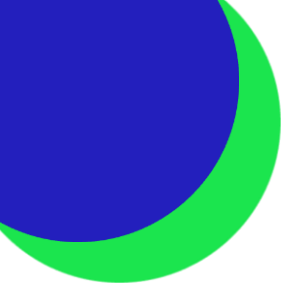


# Is there a future for Small Modular Nuclear Reactors?

Marti Jeltsov – CTO – Fermi Energia AS  
15.06.2023 | Helsinki

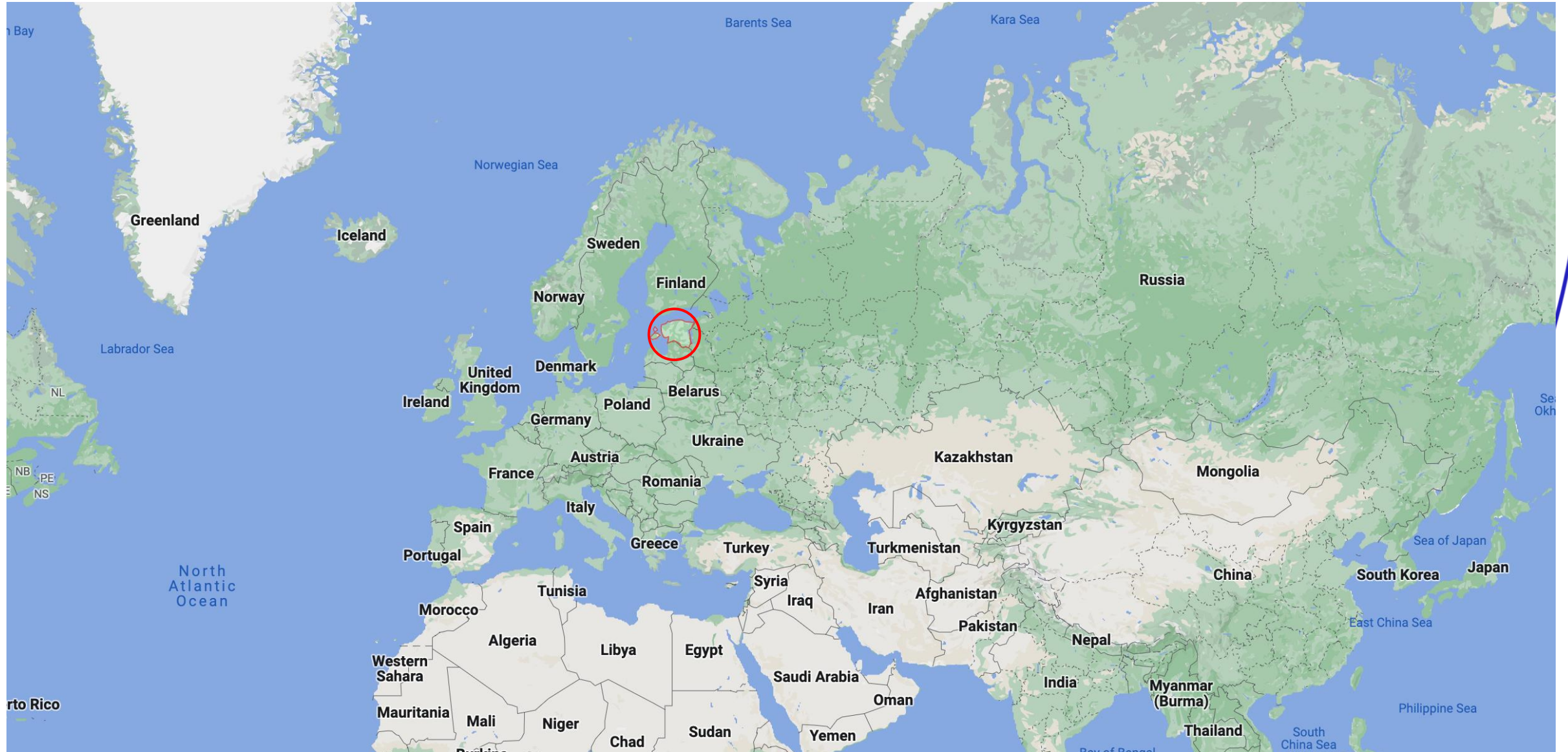


# Why?

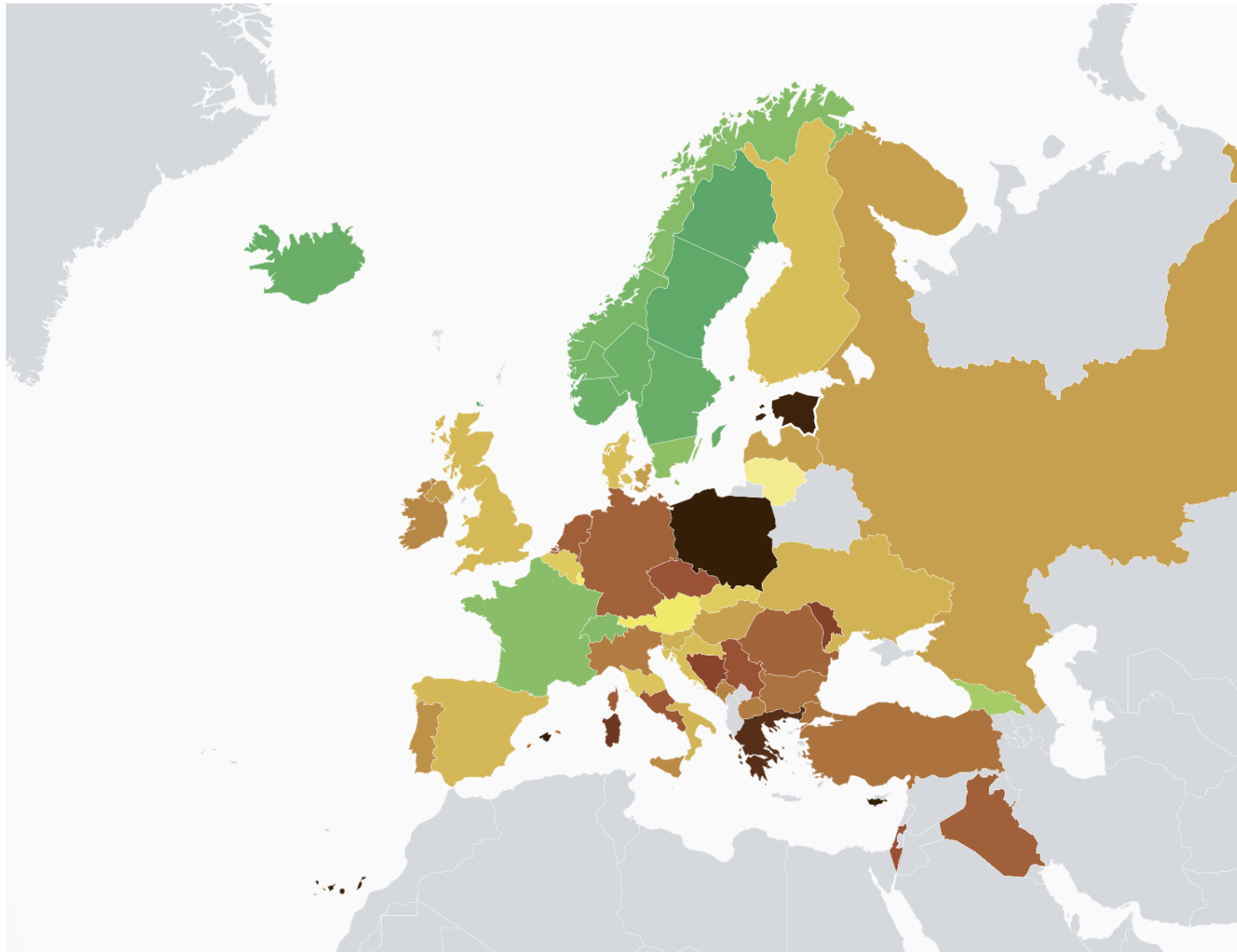
**Understanding the unique need for small-scale nuclear**



# This is Estonia



# Estonia's generation is CO2-intensive



## Estonia

aggregated 2018

778 g

Carbon Intensity  
(gCO<sub>2</sub>eq/kWh)

13%

Low-carbon

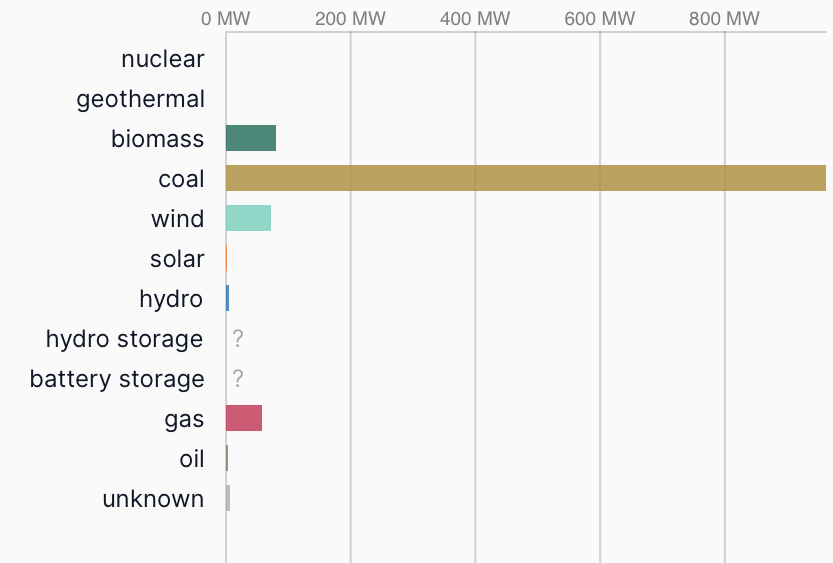
13%

Renewable

Electricity Production

Carbon Emissions

### Electricity production average by source



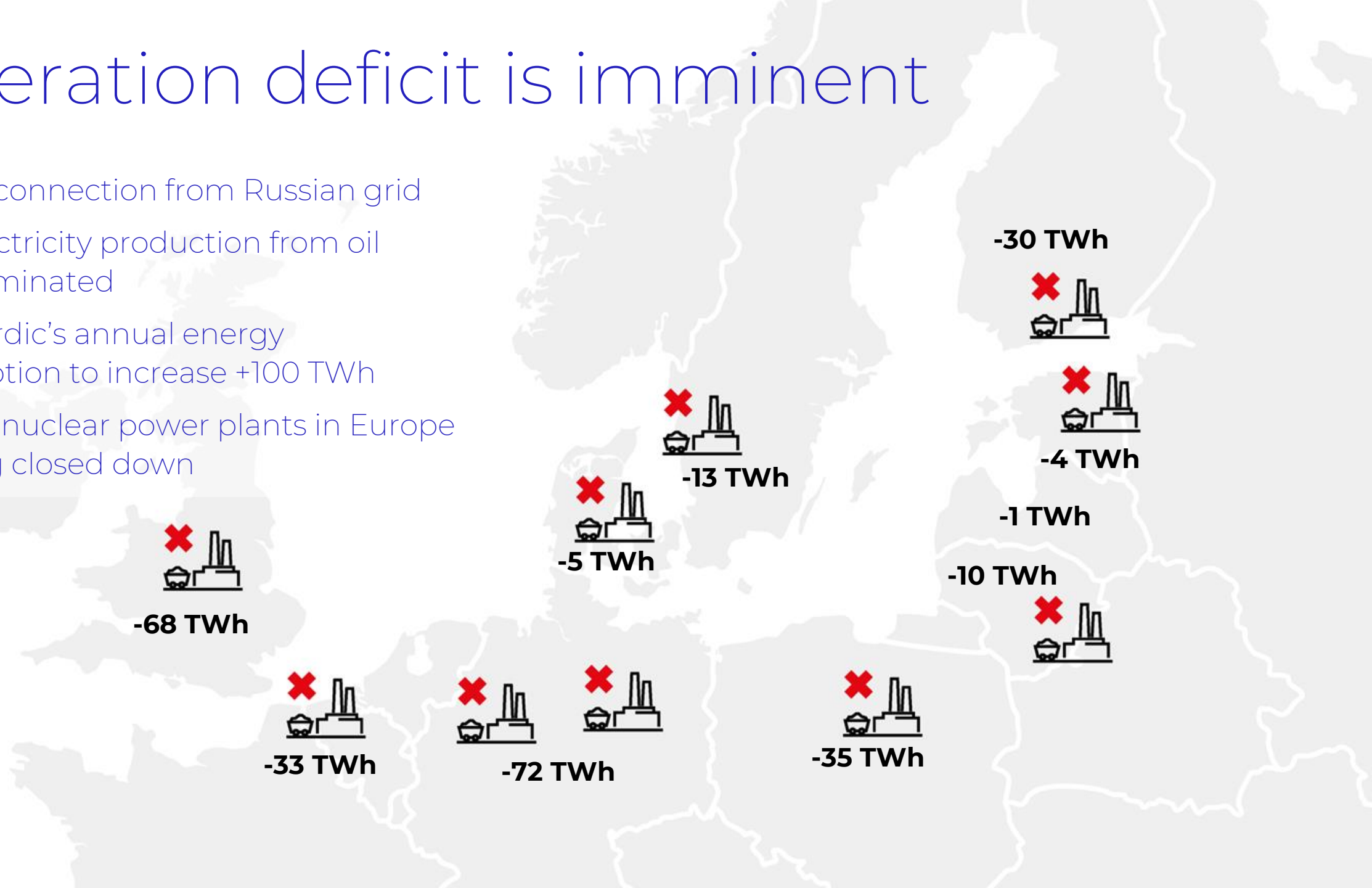
# Generation deficit is imminent

2025: Disconnection from Russian grid

2030: Electricity production from oil shale terminated

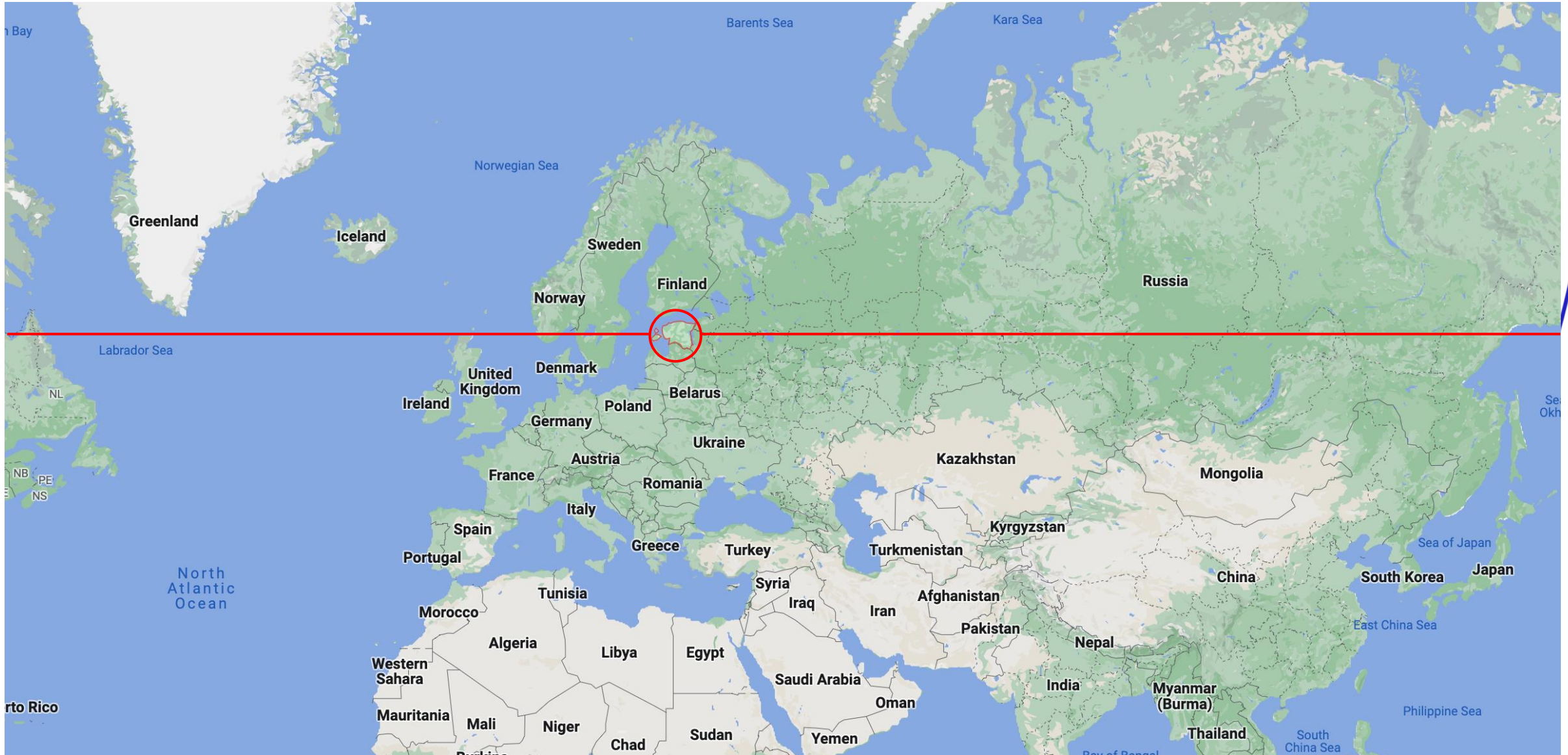
2030: Nordic's annual energy consumption to increase +100 TWh

Coal and nuclear power plants in Europe are being closed down





At  $59^{\circ}\text{N}$ , large-scale **solar** is not realistic





The landscape is too flat for hydro



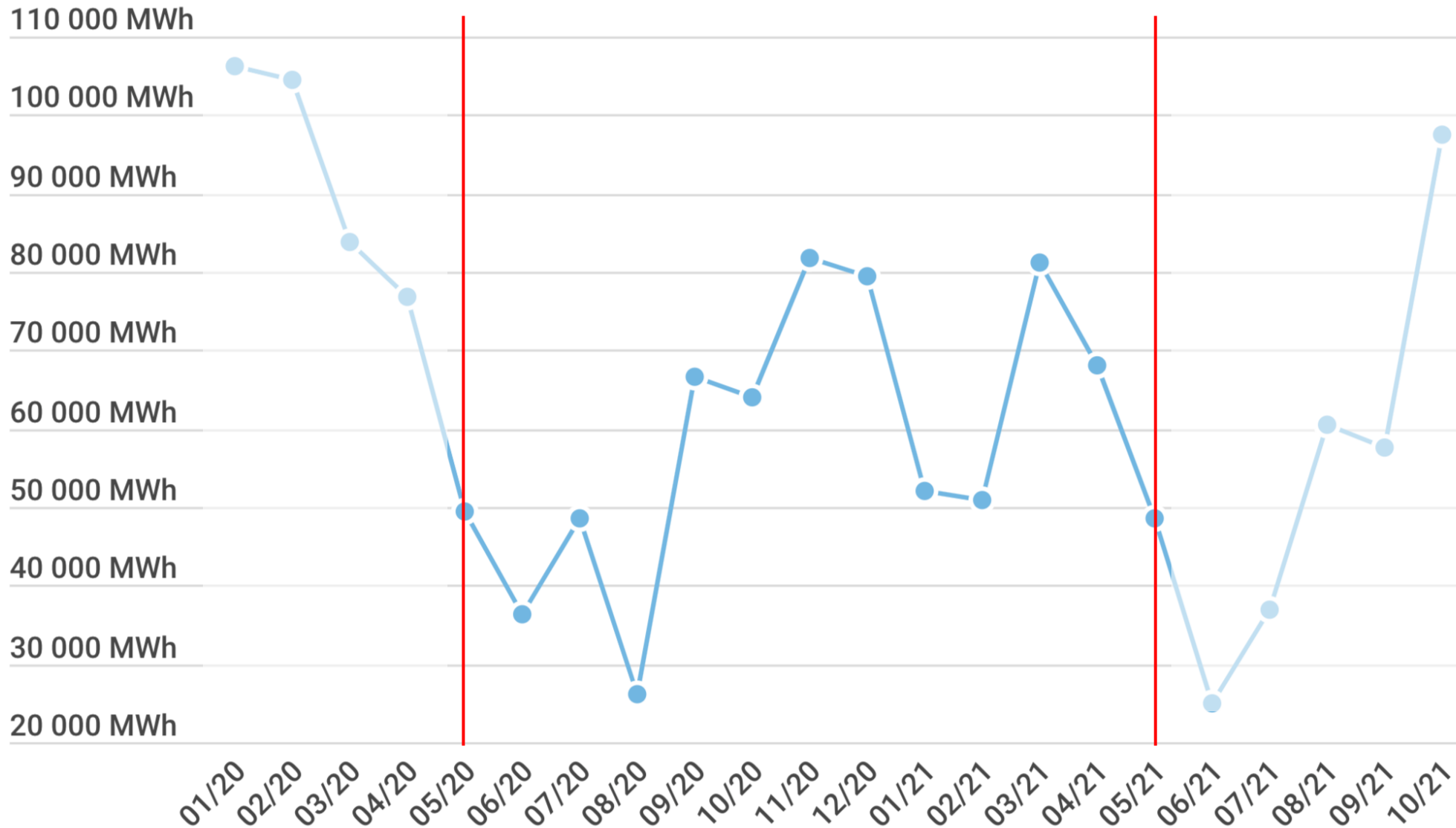


Biomass (5 - 10%) cannot solve the problem





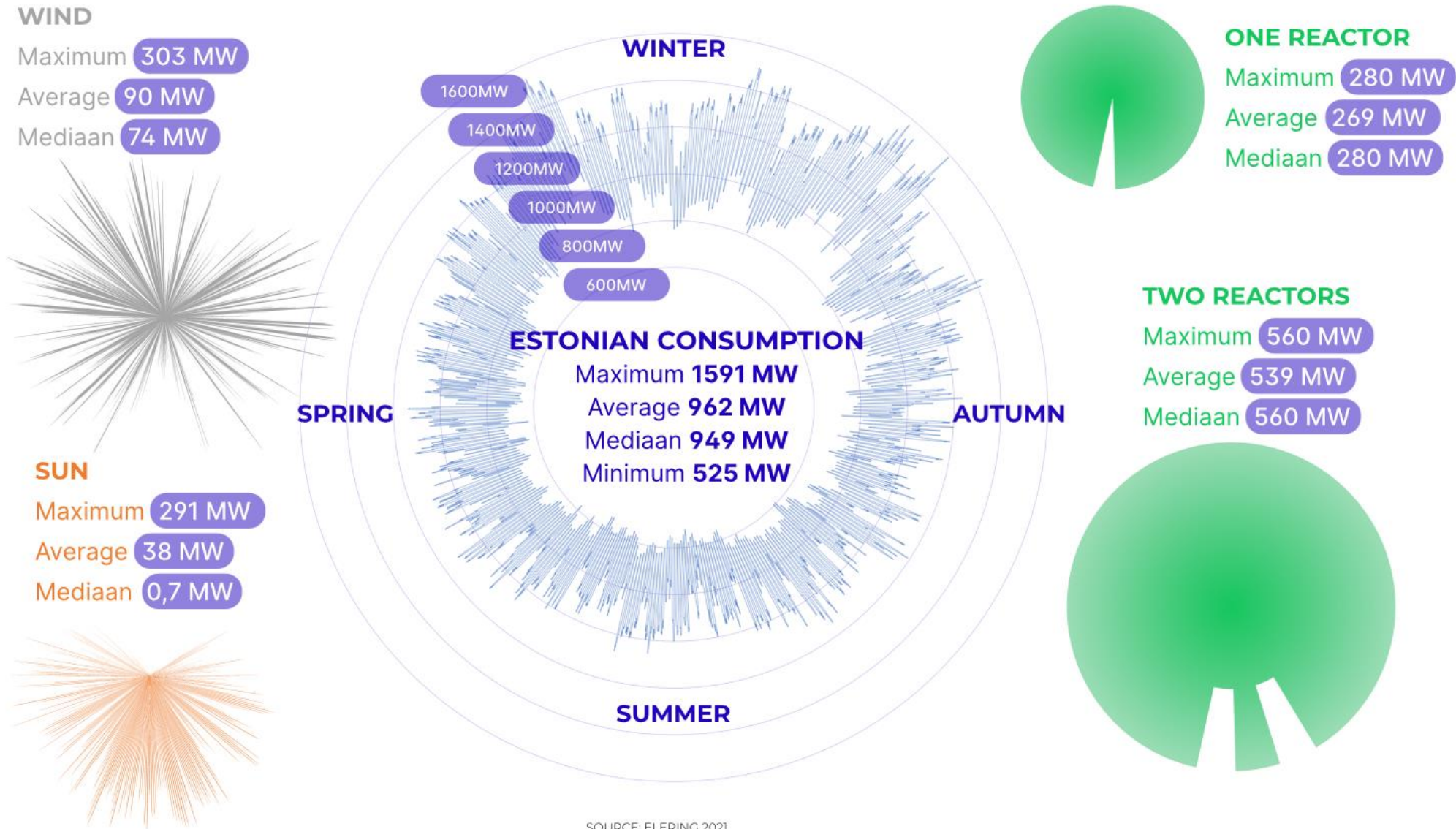
# Wind (12%) is too unpredictable



Electricity production from wind turbines in Estonia.

Area between the lines corresponds to one year

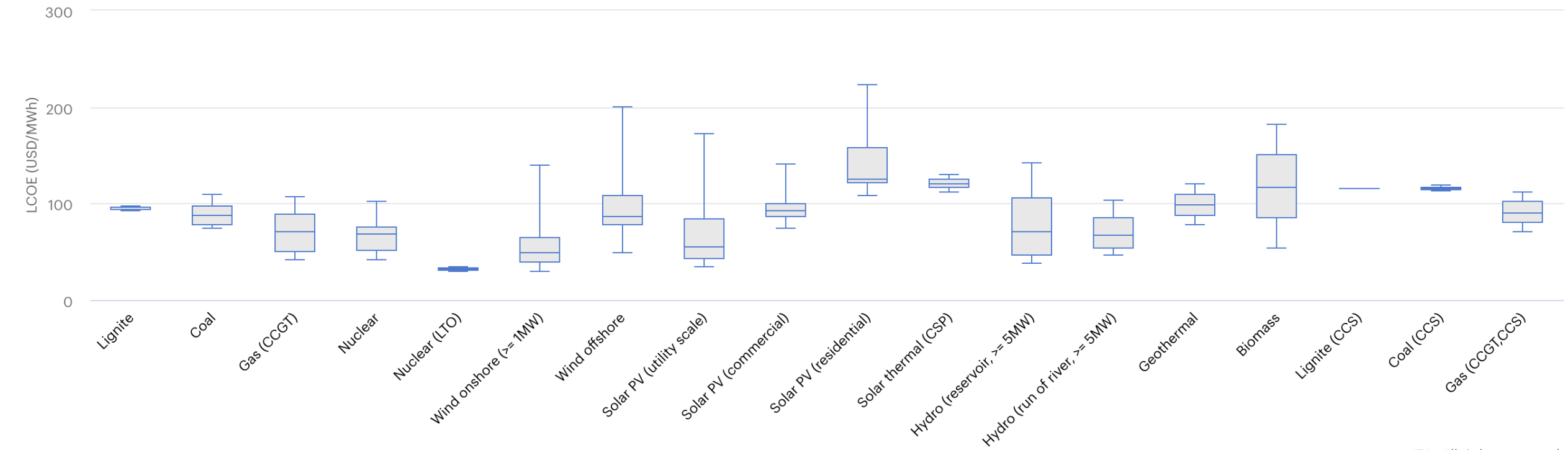
# SMRs will provide the right capacity...



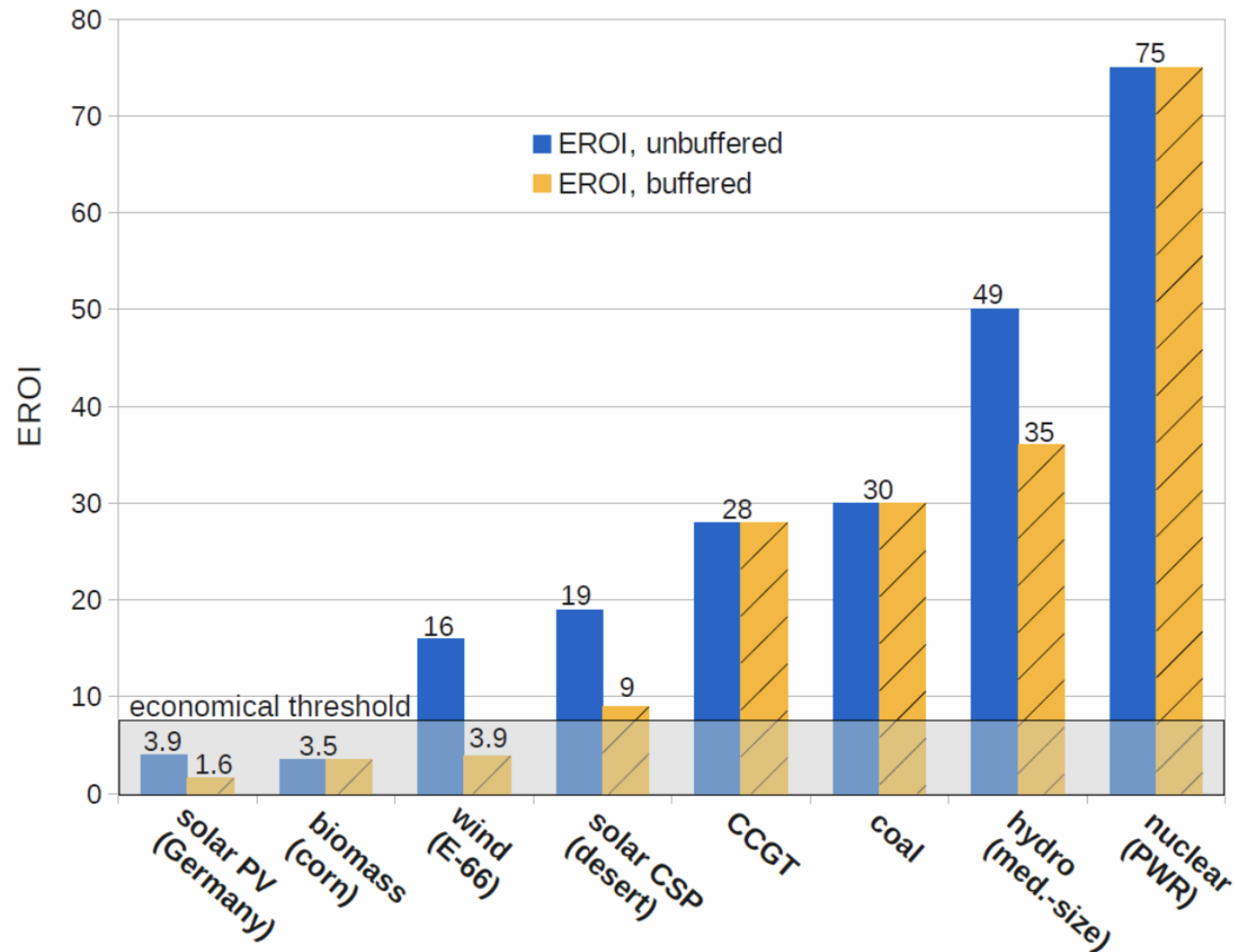


# ... at a favourable cost

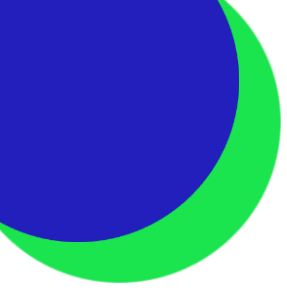
LCOE by technology, discount rate of 7%



# Because of high energy density



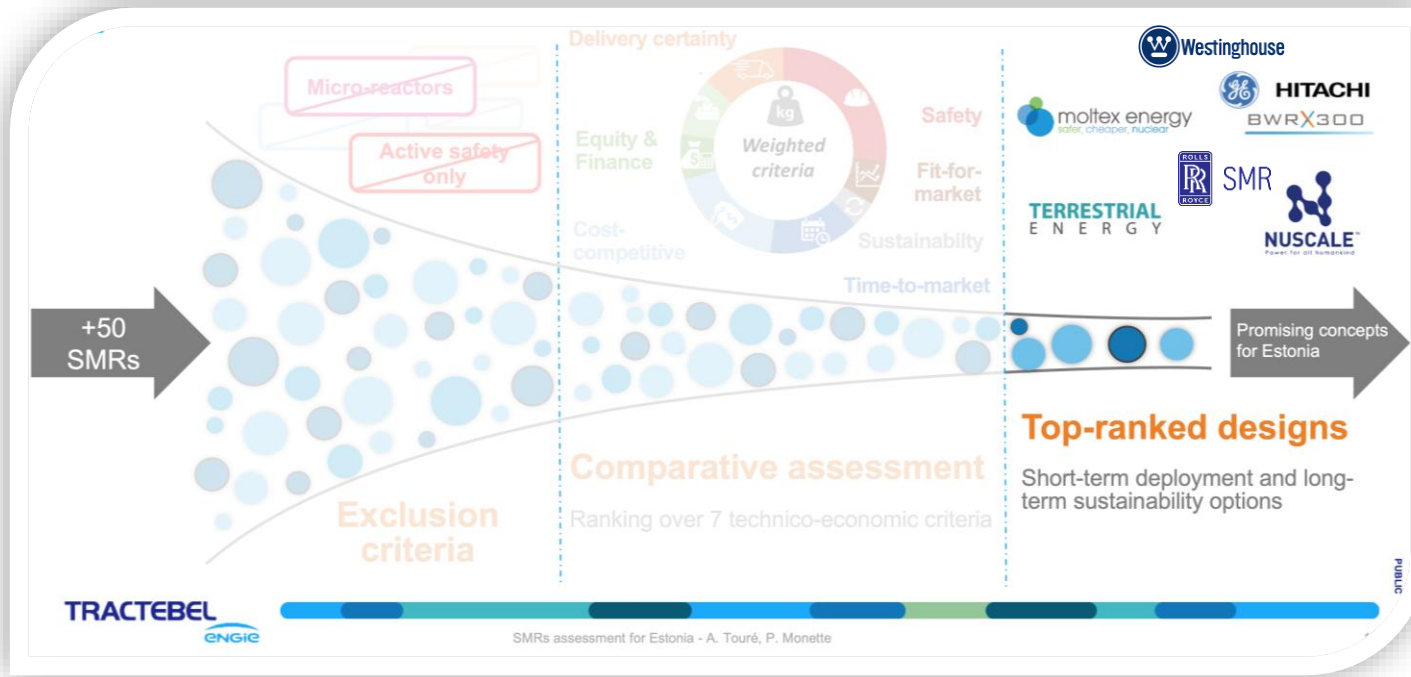




What is needed for a  
successful SMR project?



# Select suitable technology



## Reliable operating experience in reliable regions

Boiling water reactors are a proven technology with a strong knowledge base in our region and in regions with which we want to further promote good relationships

## Reliable licensing case

BWRX-300 relies on passive safety systems, uses standard BWR fuel and has a FOAK in the making in Canada.

## Reliable vendor with reliable experience

Vendor has 70 years of experience with development, construction and operation of reactors. Vendor can provide supply chain solutions to BWRX-300.





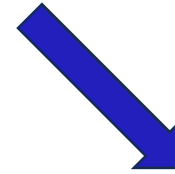
# Rethink regulator and licensing

A predictable licensing process makes for a:

- cost-efficient business case
- time-efficient implementation



Standard designs



Efficient regulations

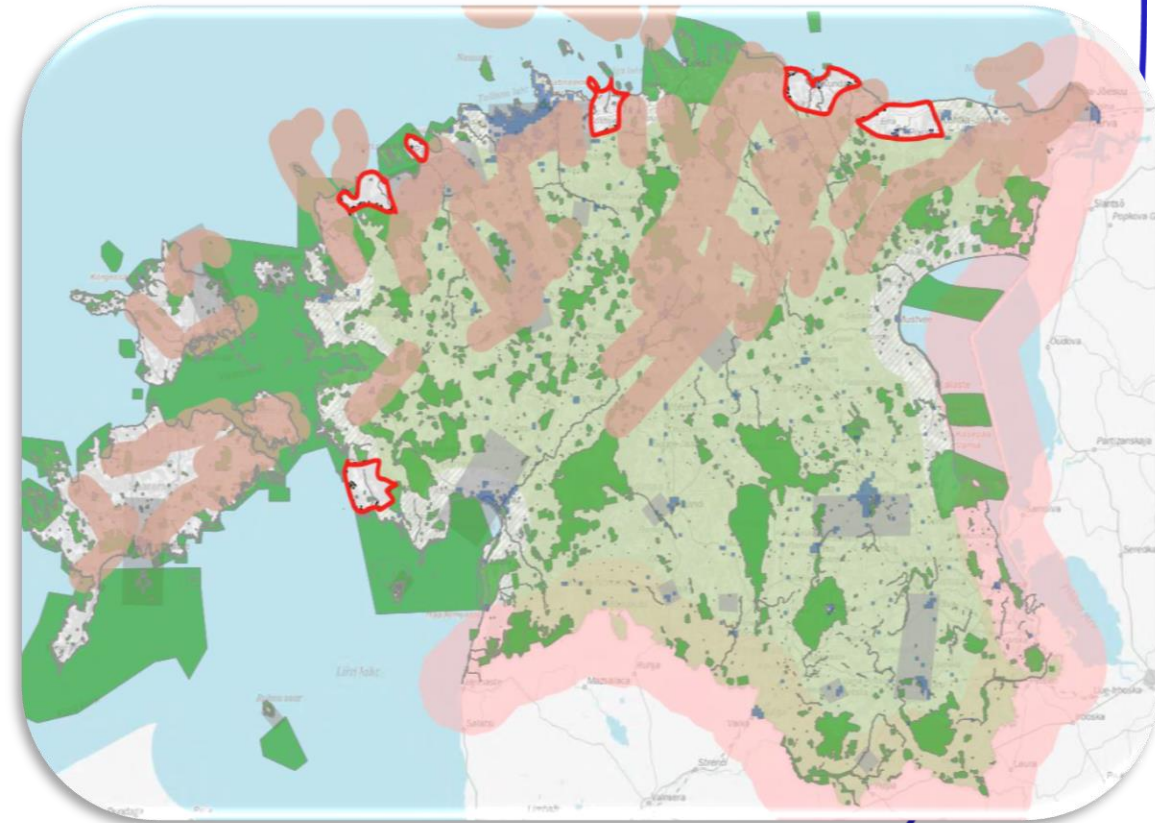
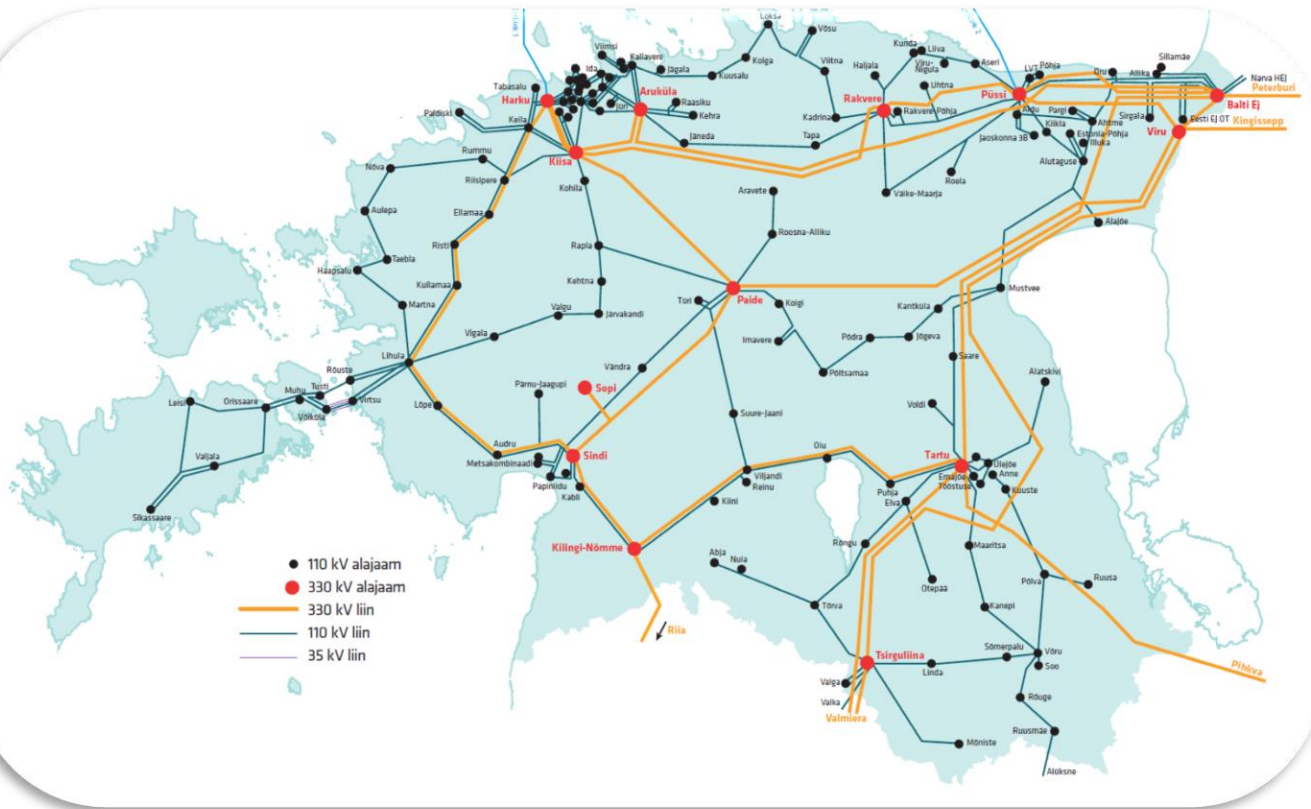
A competent and experienced regulator is a good partner



# Choose a good site

There are multiple areas in Estonia where it is possible to build SMRs, based on conducted studies and as indicated by the state.

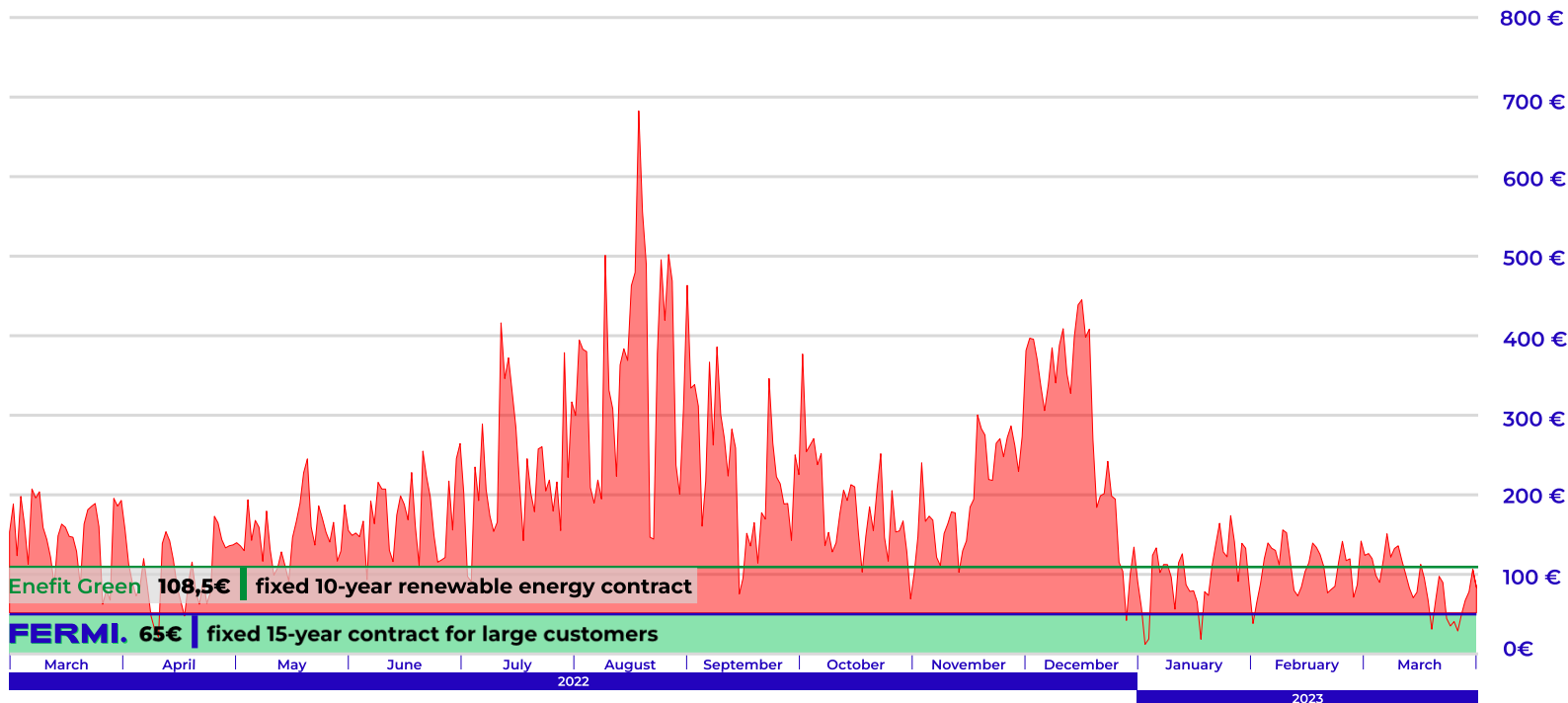
Two priority sites are identified.





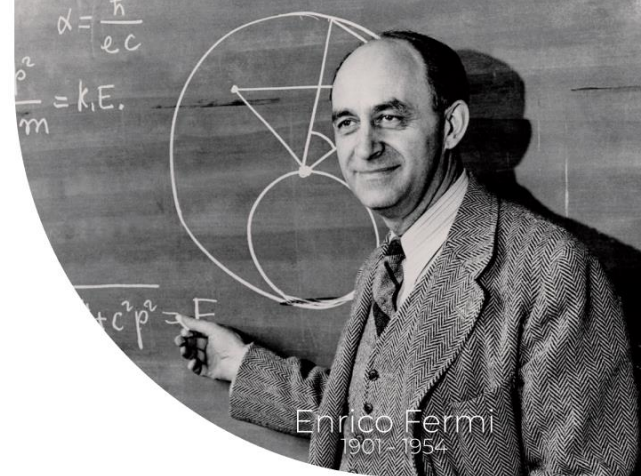
# Build up a unique market position

- Well connected Baltic market
  - Annual demand 27 TWh
  - Last year's deficit ~11 TWh
- Firm power delivery at competitive price



# Build up a resilient organisation

**FERMI.**



## FOUNDERS

**Sandor Liive** M.B.A.  
chairman of the supervisory board

**Kalev Kallemets** Ph.D.  
CEO

**Henri Ormus** M.Sc.  
member of board

**Marti Jeltsov** Ph.D.  
CTO

**Kaspar Kööp** Ph.D.  
safety manager

**Merja Pukari** Ph.D.  
fuel cycle manager

**Mait Müntel** Ph.D.  
member of the supervisory board



## TEAM

**Albert Kopjev** M.Sc.  
constructional engineer

**Albert Rice**  
nuclear engineer

**Allan Vragar** M.Sc.  
thermal engineer

**Andrei Goronovski** M.Sc.  
neutronics engineer

**Andres Ingerman**  
communications specialist

**Anet Marii Paumets**  
technical coordinator

**Anu Koppel** M.Sc.  
supply chain engineer

**Diana Revjako** M.Sc.  
member of board,  
environmental manager

**Gerli Toomet**  
office manager

**Kalev Sädemä**  
communication coordinator

**Liis Krigul**  
Virumaa communications manager

**Helen Cook** Ph.D.  
nuclear law counselor

**Ivar Kurvits** Ph.D.  
general counsel

**Mihkel Loide** M.A.  
head of communications

**Peter Treialt** M.B.A.  
CFO

**Rainer Küngas** Ph.D.  
hydrogen expert

**Teet Nurmeoja** M.Sc.  
program director

**Urmas Voit**  
key account manager

## SHAREHOLDERS

Founders  
Kunda Trans

T. Kaasik, K. Järvelill, K. Pärnoja,  
J. Luts, M. Henk, H. Meerits,  
N. Seli, S. Aswani, A. Lumberg

**VATTENFALL**   
1,5 mln. euro

 **FUNDERBEAM**  
1 281 investors

**TRACTEBEL**  




Raised capital 2019-2023:  
**6,6 mln. €**

## PARTNERS

 **HITACHI**



 **Latvenergo**

 **Laurentis**  
Energy Partners

## SUPERVISORY BOARD

**Sandor Liive** M.B.A.  
chairman

**Mait Müntel** Ph.D.  
member of board

**Ando Leppiman** Ph.D.  
nõukogu liige

**Björn Linde**  
member of board (Vattenfall)



# Small nuclear has future

- Nuclear energy is a mature technology providing reliable firm capacity in our region and around the world
- Choose the right capacity balance
- SMRs fit Estonia (and private capital)
- Implement in collaboration





**FERMI.**