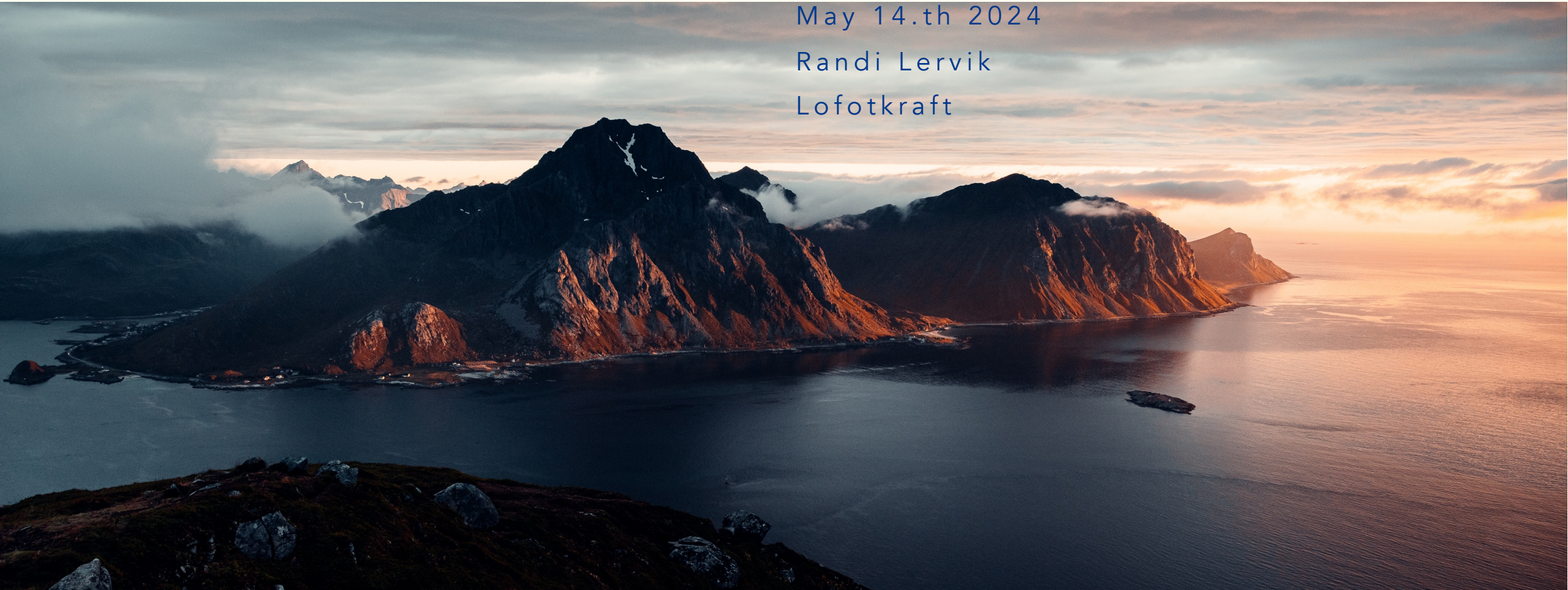
Energy Futures – Transitions and Innovations

Saskatoon

May 14.th 2024

Randi Lervik

Lofotkraft



Outline

Norway – the Utilitiy Energy System,
Production and Consumption

Lofoten Islands – the archipelago,
the people, the energy system

Challenges -

And how we meet them

Norway in the Arctic

Norway and Energy – production and trading

- Population 5,4 Mill - 385 207 km²

- 39,7 GW installed capacity
- 154 TWh production (2023)
- 18 TWh surplus (2023)

Power Mix

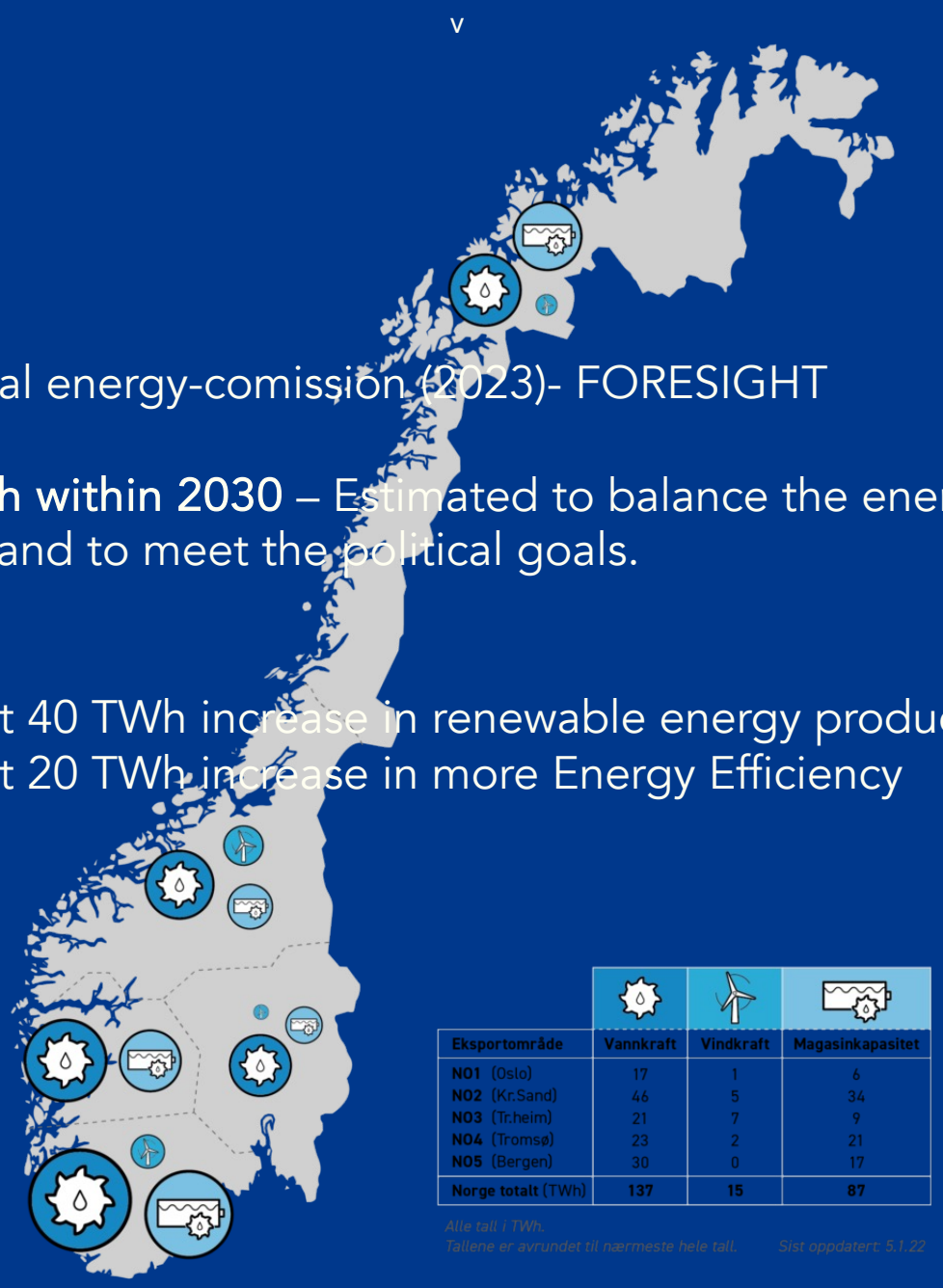
- 87% Hydropower
- 10 % Wind
- 1,5 % Thermal Power
- 1,5 % Other, including Solar

- Marketbased (Norvegian Energy Act)

National energy-comission (2023)- FORESIGHT

60 TWh within 2030 – Estimated to balance the energy-needs and to meet the political goals.

How:
At least 40 TWh increase in renewable energy production
At least 20 TWh increase in more Energy Efficiency



Eksportområde	Vannkraft	Vindkraft	Magasinkapasitet
NO1 (Oslo)	17	1	6
NO2 (Kr.Sand)	46	5	34
NO3 (Tr.heim)	21	7	9
NO4 (Tromsø)	23	2	21
NO5 (Bergen)	30	0	17
Norge totalt (TWh)	137	15	87

Alle tall i TWh.
Tallene er avrundet til nærmeste hele tall. *Sist oppdatert: 5.1.22*

Norway – transmission –

3 levels

transmission grid – 132 – 420 kV –

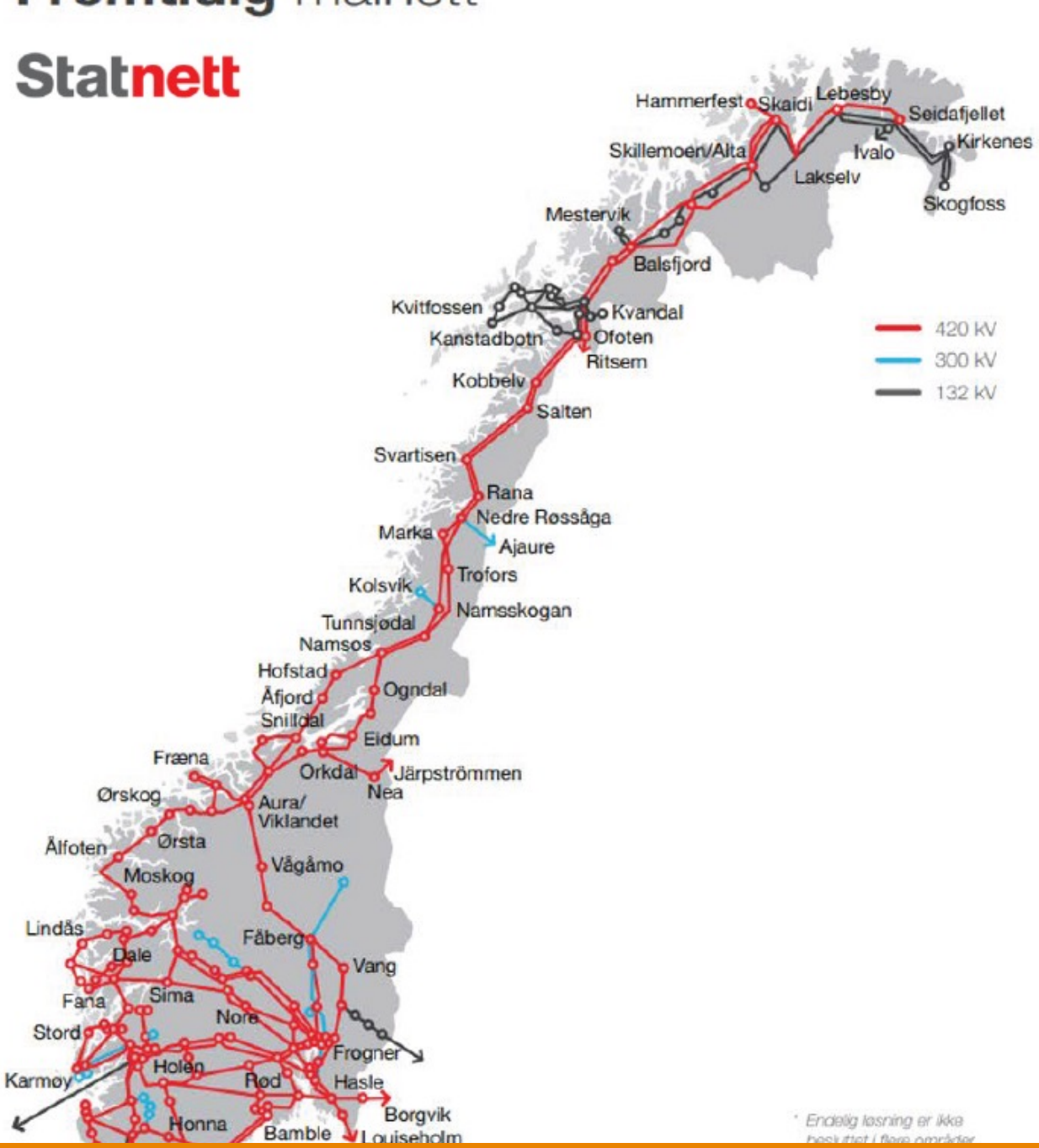
length: 12000 km - operator: Statnett (TSO)

regional distribution grid – 33 – 132 kV

length 19000 km – operators: Statnett and regional operators (DSO)

local distribution grid – up to 22 kV –

length 101 000 km – operator: DSO



The Lofoten Islands

6 municipalities

Appr 25.000 inhabitants

Growing poulation

1 227 km²

Main industries:

- Fisheries and Maritime industries –
  - Over 500 vessels – delivering +55.000 tonn wild-catched fish
  - +Aquaculture – mainly salmon
  - Local Ship-yards
- Tourism – 0,5 – 1 Mill visitors pr year.

Lofotkraft AS

Regional Energy Company owned by the municipalities in the region

Elmea – grid operator (DSO)

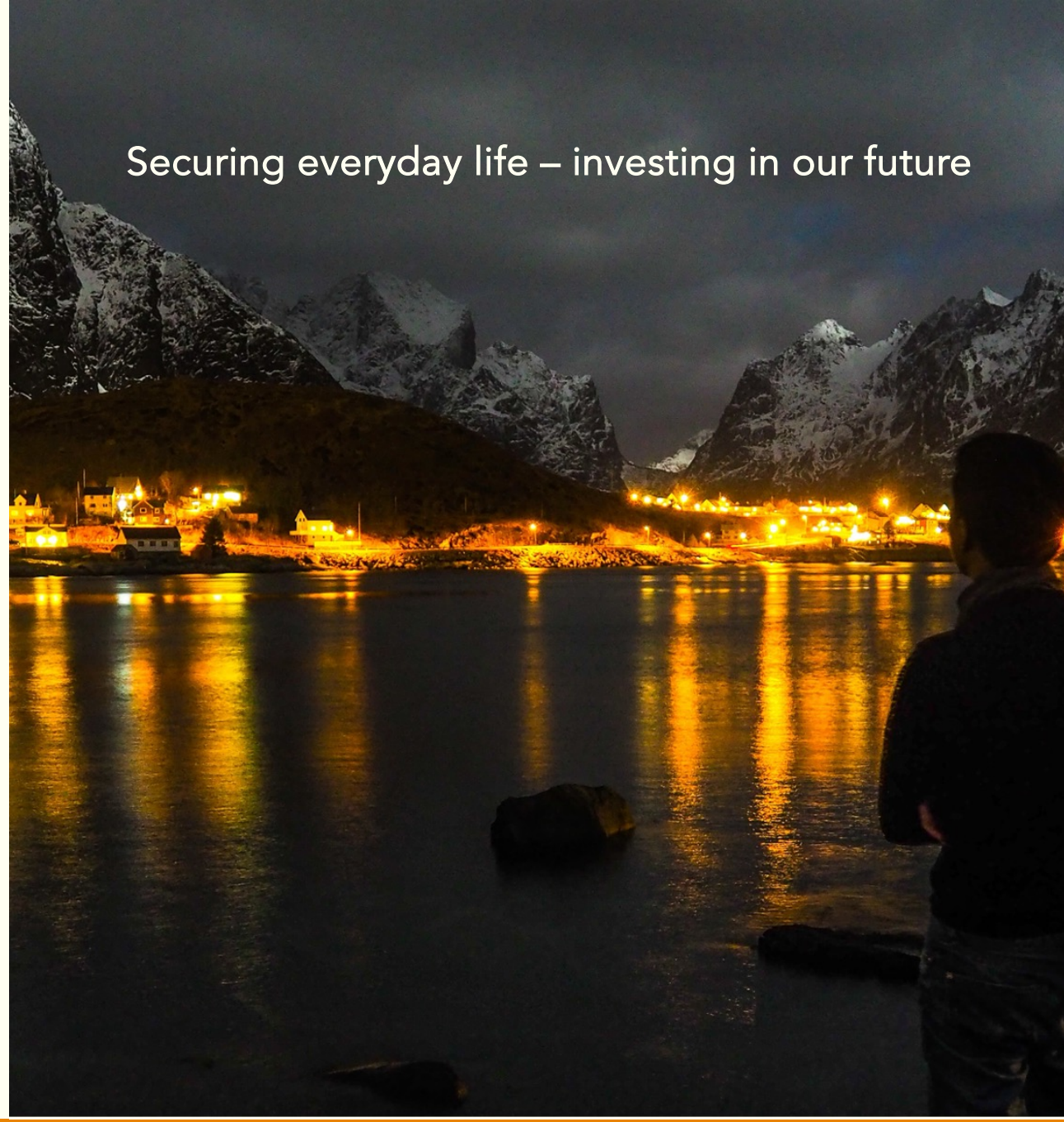
Lofotkraft Production – Hydropower

Lofotkraft Bredbånd - Digital Infrastructure- Broadband

Aqila - El installations

Lofotkraft Muligheter –R&D/I sustainable & business development

Yve/PolarKraft – PowerSales



Challenges – and how do we meet them

Total investment 2 billion NOK

Challenge: Not enough capacity connecting to Main Grid – Statnett

- Planned: 132 kV – Needed: 420 kV
- As we are dependent on import of energy. – not selfsufficient
- Discussions with DSO Statnett over several years
- All time high this winter, going though the roof of stipulated «høylasttime» with a 10-year prognoses
- Documented 1250 new MW in industry and public sector only,
- **Statnett starts high-speed process (KVU) with possible outcome to initiate new line with 420kV capacity - HURRA!**
- **BUT: Timeframe: 10 years before new line, with lean process.**
- TSO and DSO's start looking at alternatives in paralell with new line – **pricing, flexibility-products, batteries.**
- WE ARE NOT THE ONLY ONES!


«Lofoten will be powered by renewable energy in the not-so-distant future. Lofoten is continuously an attractive place to live, and our business sector is both sustainable and viable.
We will contribute to achieve the UN climate goals."
DE GRØNNE ØYENE
LOFOTEN 2030
Lofotkraft
LOFOTRÅDET
lofoten

Plug og Lofotkraft – proud partners in **ZeroKyst-project**

ZeroKyst are devoloping zeroemission solutions for the coastal fishingfleet, and contibuting to a rapid technology-shift for all vessel types within fishing and aquaculture industry

plug

Lofotkraft Muligheter

SIEMENS energy

H2 MARINE

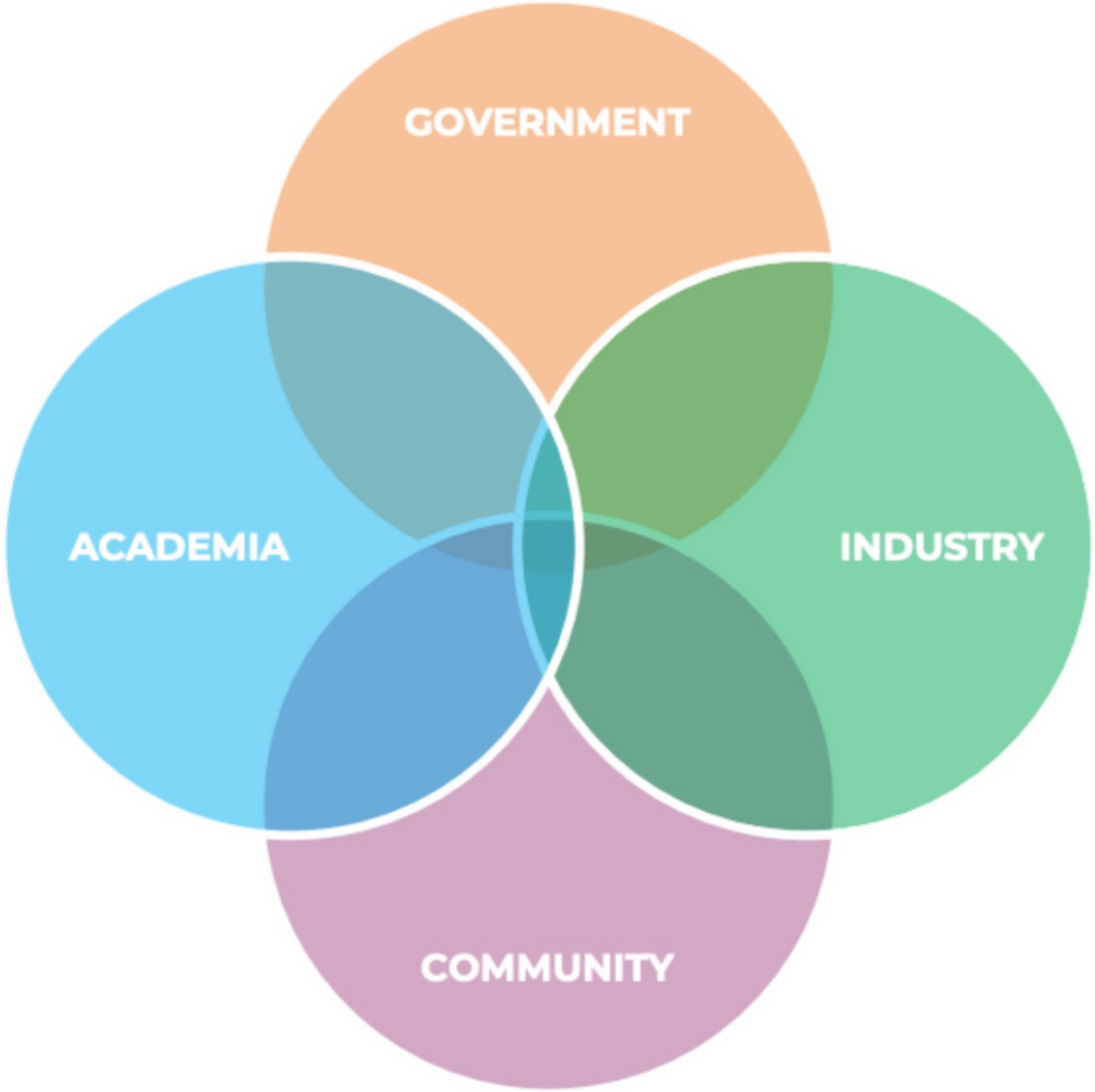
Ballstad Slip

April 12.th 2024

Official opening of the worlds first fast-charging facilities for fishing-vessels

Ramberg, Lofoten

Quadruple helix aproach



Thanks for listening

Randi Lervik
Project manager
Lofotkraft Muligheter AS
Email: randi.lervik@lofotkraft.no
Phone: +47 91674790