



# Solving The Arctic Energy Challenge: Examples of Green Transition on Svalbard and the Faroe Islands

## Agenda:

**11.15** - Welcome and Introduction  
to the Arctic Energy Situation

Kevin Johnsen

**11.30** - The Future Energy System  
in Longyearbyen

Hans-Kristian Ringkjøb

**11.45** - Heat Supply in Leirvík – A  
Case Study

Morten Hørmann

**12.00** - Q&A



# Introduction to the Arctic Energy Situation

Kevin Johnsen

Adviser, Nordic Energy Research





# What we do

- We are under the auspices of the **Nordic Council of Ministers** – the intergovernmental body between Denmark, Finland, Iceland, Norway and Sweden.
- We fund R&D to promote a sustainable future
- We contribute to policy-making

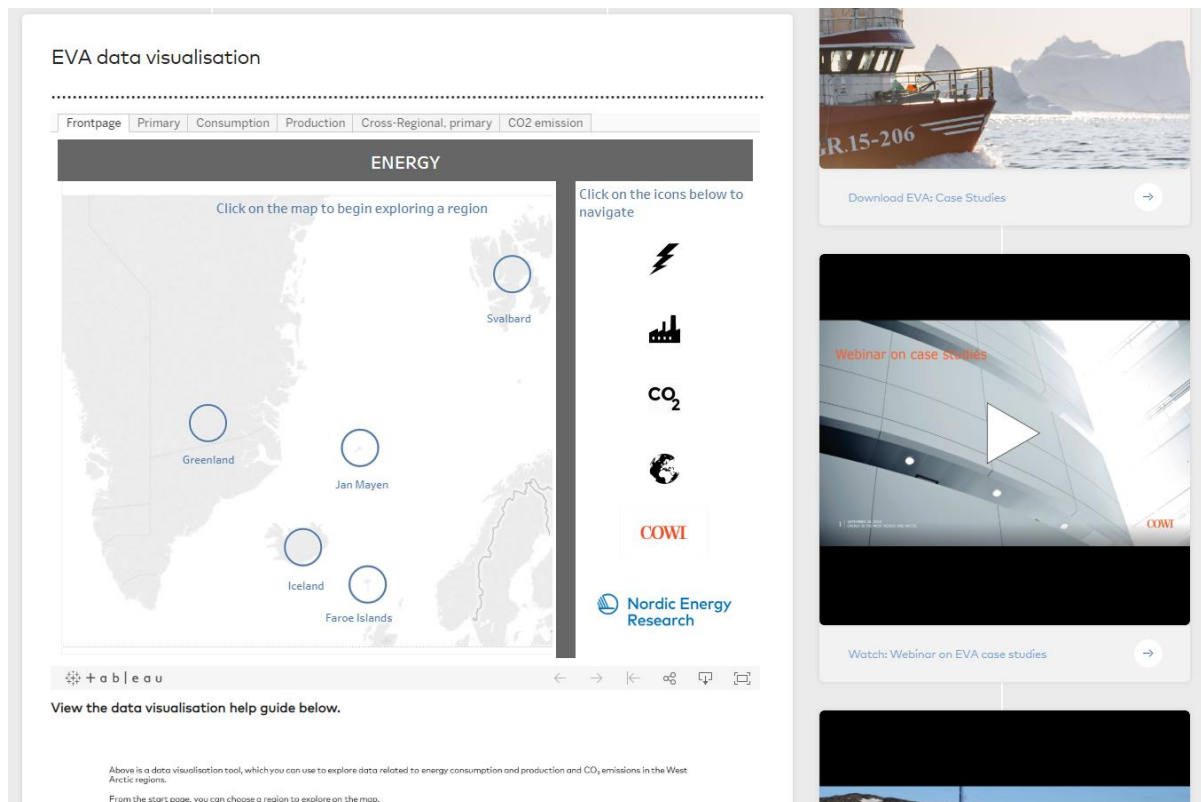




## What we wanted to do:

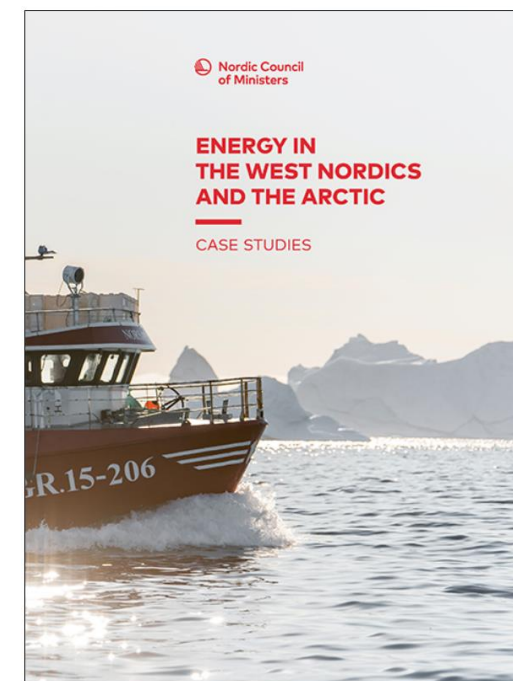
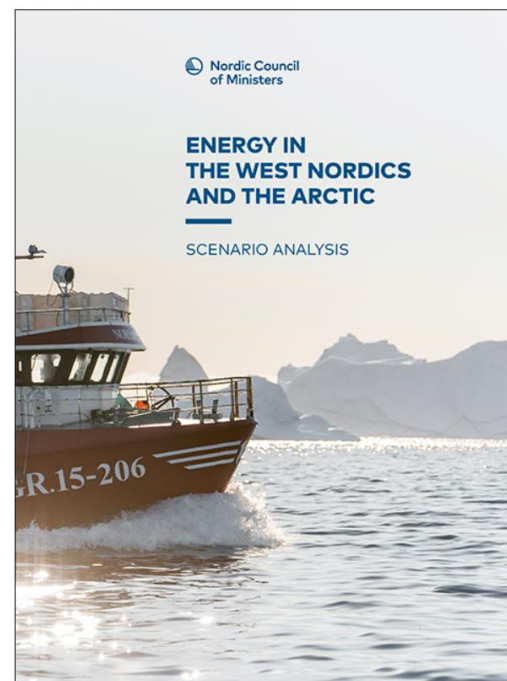
- Build on the experiences from the Nordic Energy Technology Perspectives 2016 (NETP)
- Produce a coherent analysis of the energy system in the west Nordics and the arctic areas
- Find research areas for more Nordic cooperation

Web page with interactive map,  
webinars and modelling-resources:




# ENERGY IN THE WEST NORDICS AND THE ARCTIC

Two publications:





An aerial photograph of a large dam and reservoir in a mountainous region. The reservoir is a deep blue, reflecting the sky and the surrounding green and brown hills. A road runs along the edge of the reservoir, with several small buildings and structures. In the foreground, a person is standing on a rocky outcrop, looking down at the reservoir. The background shows steep, layered mountains under a cloudy sky.

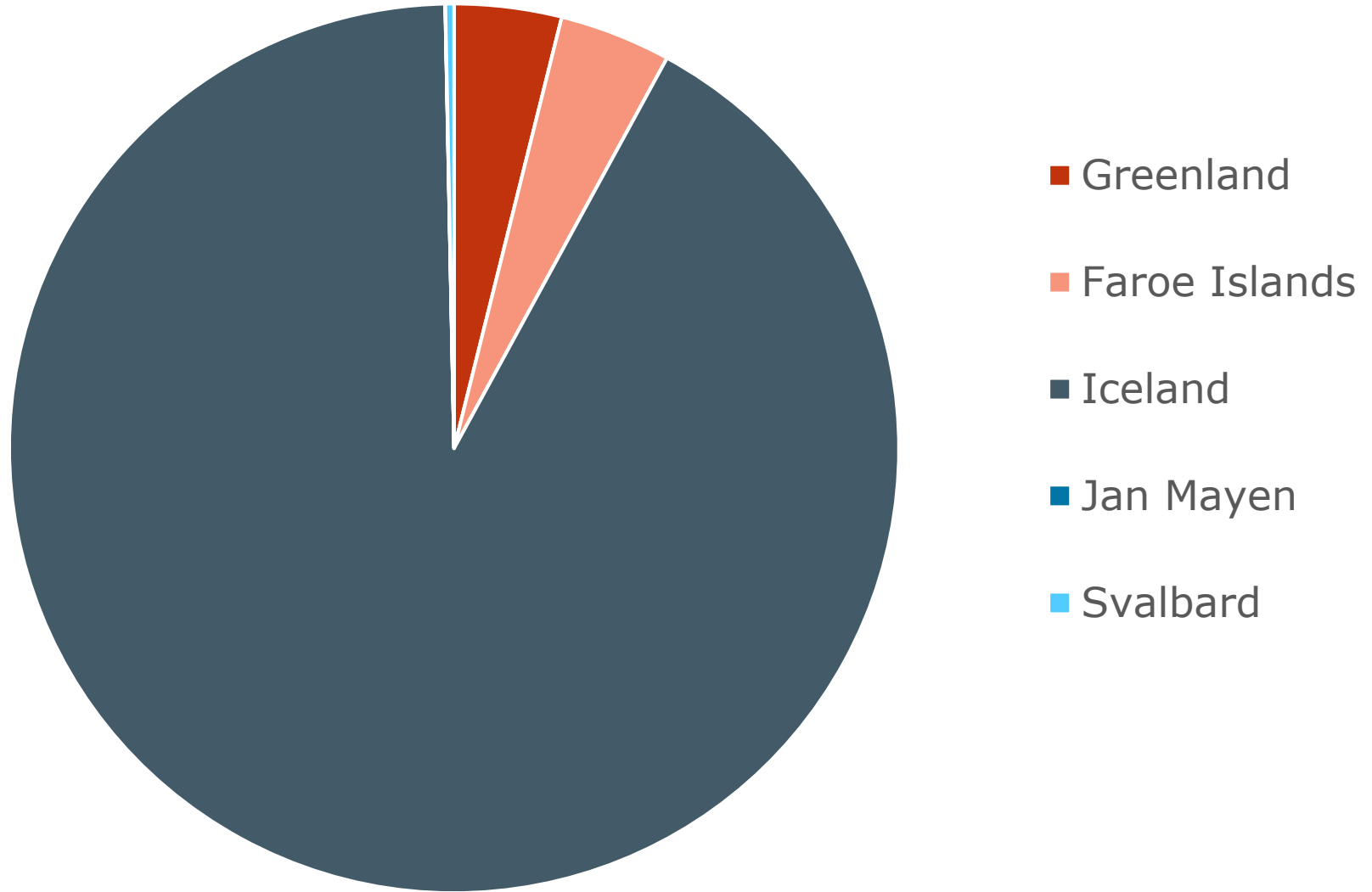
# Introduction to the Arctic Energy Situation

Kevin Johnsen

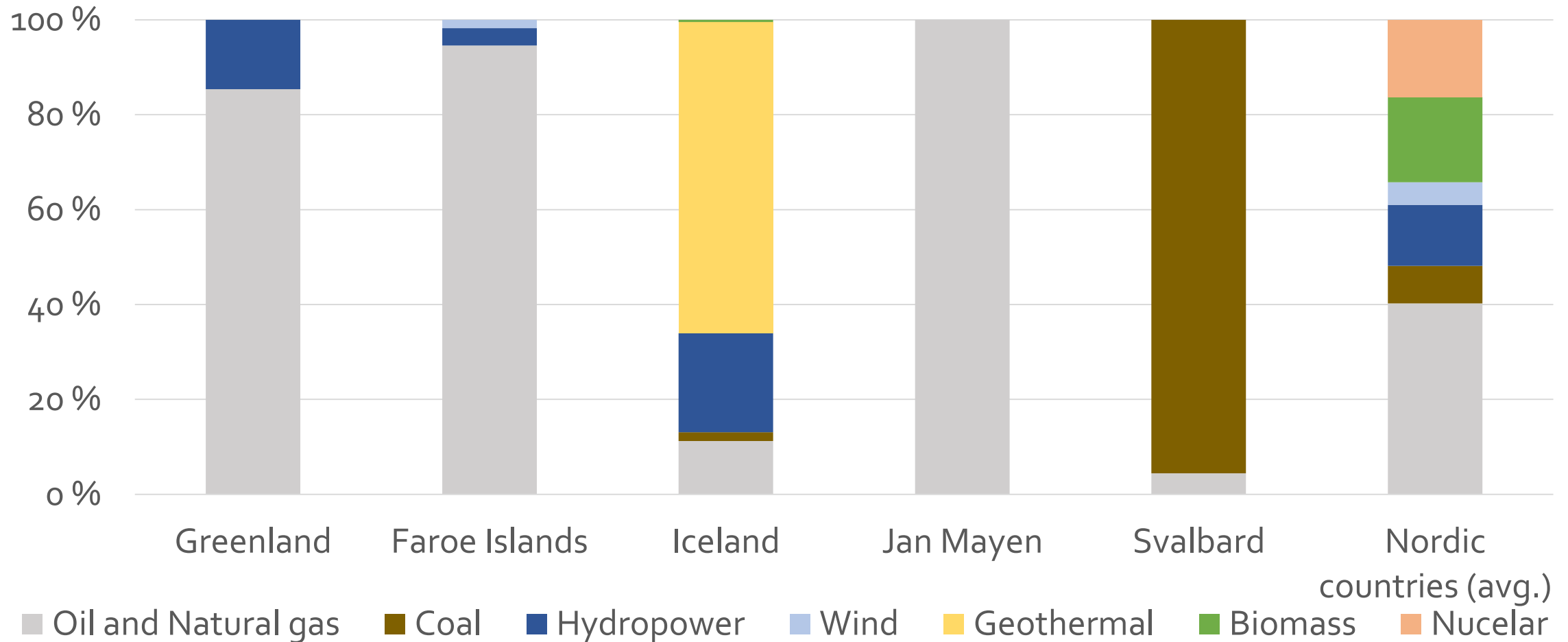
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# Total energy consumption



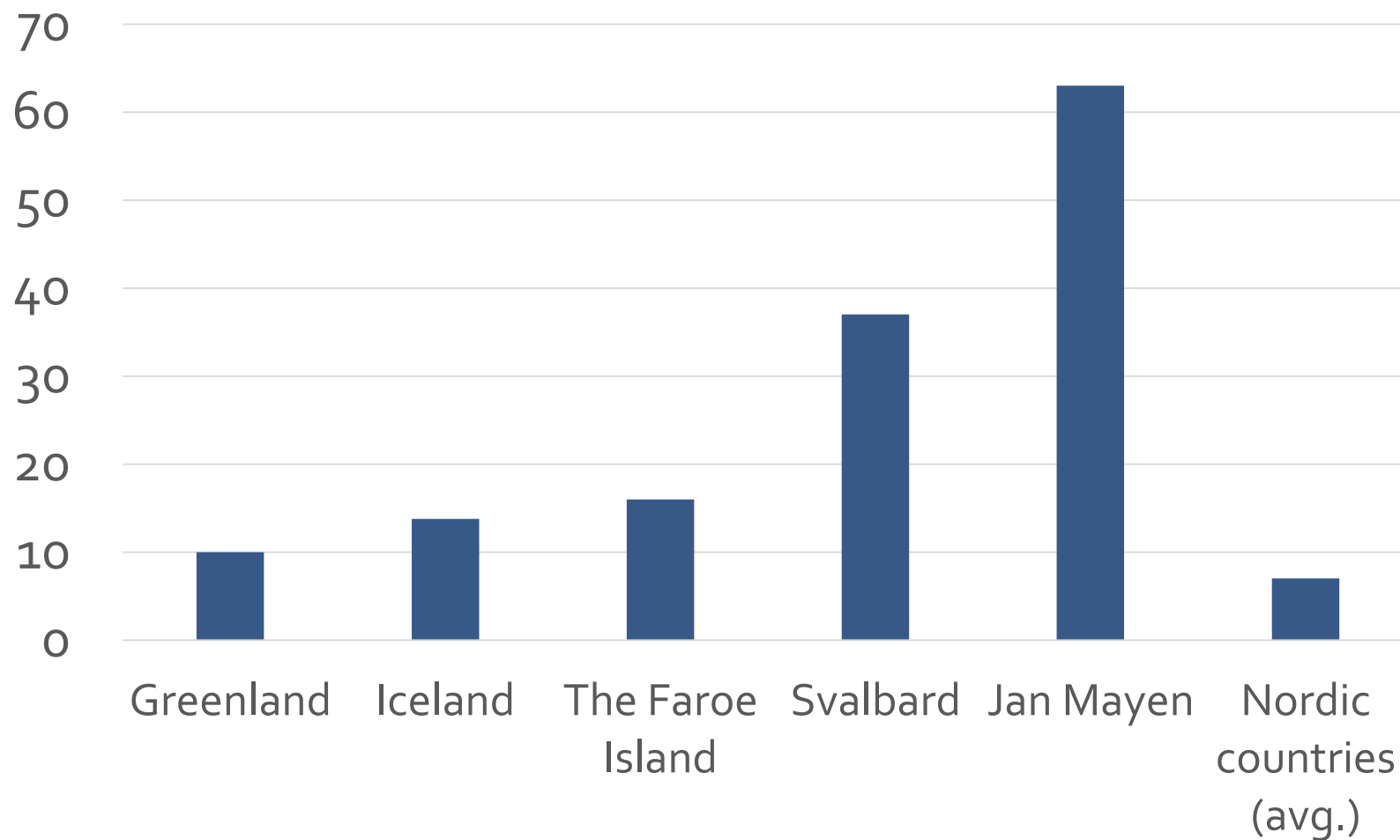
# Energy sources





# CO<sub>2</sub>-emissions

CO<sub>2</sub> emissions per capita (tonnes)



**Qatar** = 35.73  
tonnes CO<sub>2</sub> per  
capita

# ENERGY IN THE WEST NORDICS AND THE ARCTIC

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SCENARIO ANALYSIS



# ENERGY IN THE WEST NORDICS AND THE ARCTIC

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CASE STUDIES





# ENERGY IN THE WEST NORDICS AND THE ARCTIC

## Scenario Analysis:

- CO<sub>2</sub> targets based on IEA policy scenarios

CO <sub>2</sub> tonnes per capita	Greenland	Iceland	Faroe Islands	Svalbard and Jan Mayen
BAU	--- Unrestricted ---			
2DS	4	4	5	20
CNS	1	1	1	1

## Case Studies:

1. Electrification of road transport
2. Igaliku hybrid energy supply
3. Electrification of fishing vessels
4. Tourism
5. Decarbonizing Svalbard

# ENERGY IN THE WEST NORDICS AND THE ARCTIC

## Scenario Analysis:

- CO<sub>2</sub> targets based on IEA policy scenarios

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**Important:**

No taxes

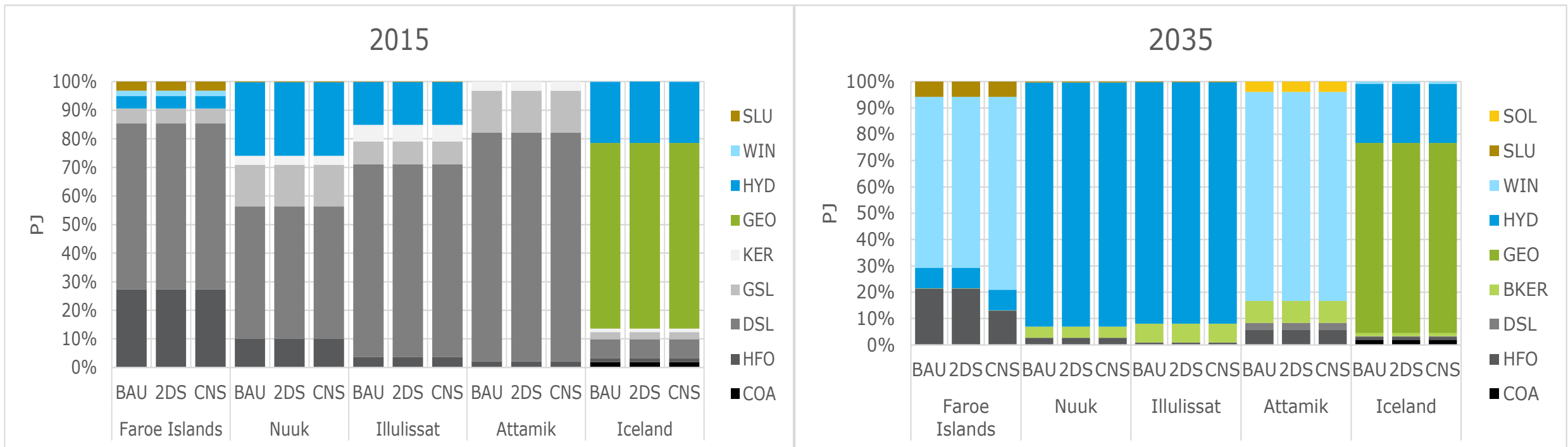
No minimum threshold  
for economic gains

No financing hurdles



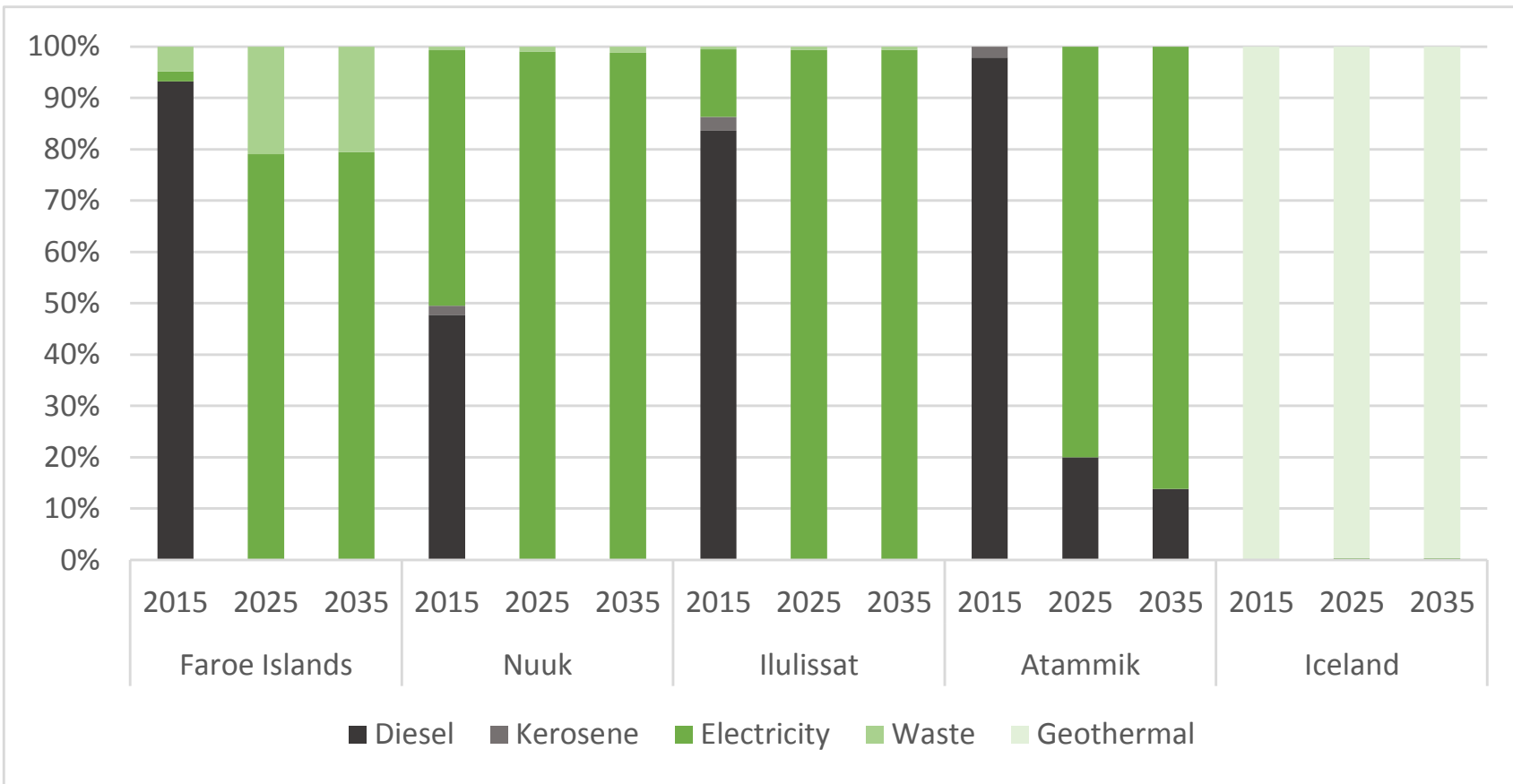
# Scenario Analysis: Renewable energy is cost efficient

This happens without imposing restrictions on CO<sub>2</sub> emissions



Disclaimer: model results

# Scenario Analysis: Electrification of heating is already behind schedule



It's cheap

It's flexible

It has great synergies



# Case studies:

## Electrification of road transport

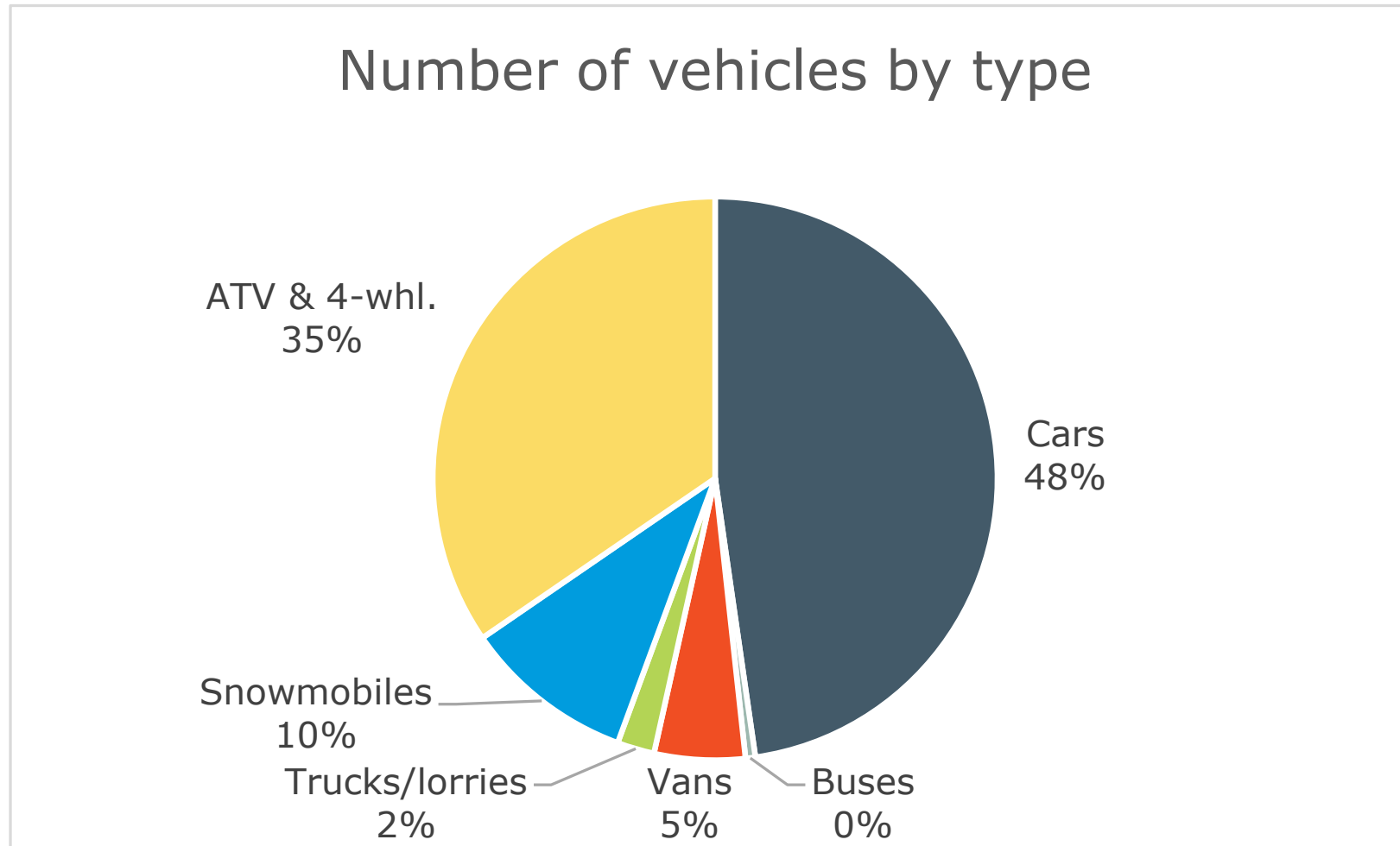
Climate hardened batteries	<i>Two solutions close to commercialisation</i>
Electric off-road vehicles	<i>Wide range of options and even further rapid development in coming years</i>
Electric heavy vehicles (busses and lorries)	<i>City busses and short/medium range lorries are available</i>  <i>Long range remains a challenge</i>



Taiga electric snowmobile

# Case studies:

## Electrification of road transport





# Case studies:

## Electrification of fishing vessels

*"In five years' time, we will see battery-driven fishing boats as completely normal."*

*(Erik Ianssen, Selfa Arctic A/S)*

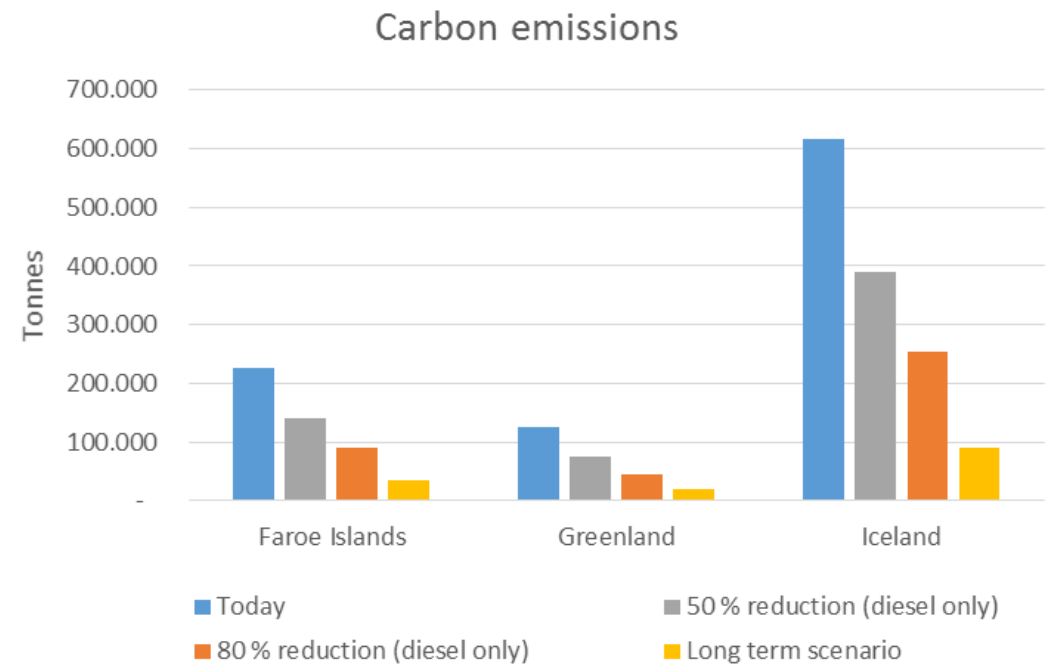
Fuel cells for large long distance vessels  
Several pilot projects with cruise ships and ferries



Photo: Selfa/Siemens

# Case studies: Electrification of fishing vessels

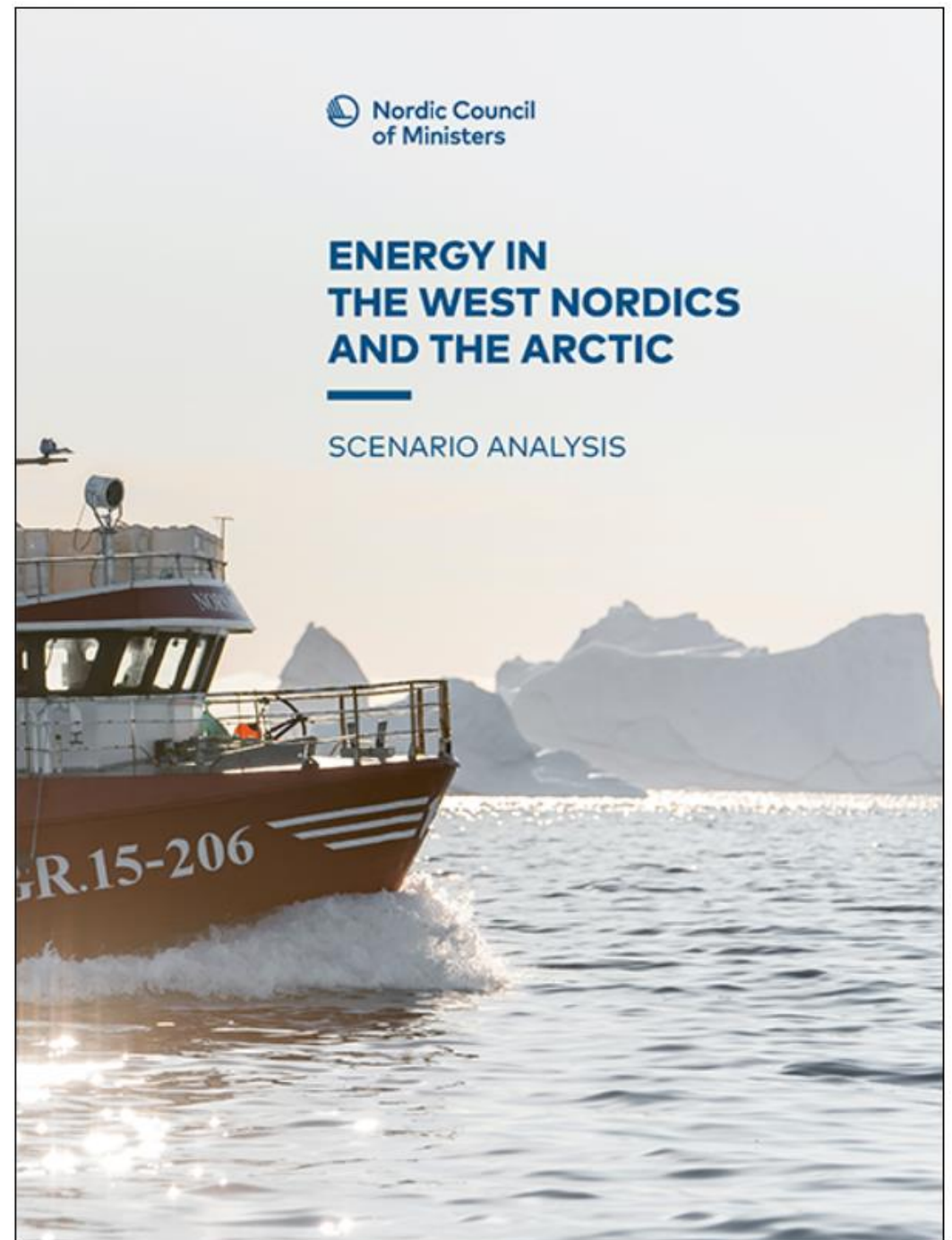
Scenarios for reduction potentials from electrification of diesel powered fishing vessels





Download report and  
more at:

[www.nordicenergy.org/project/eva/](http://www.nordicenergy.org/project/eva/)



# Thank you for your attention!

**Kevin Johnsen, Adviser**

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