

# NORDIC HYDROPOWER CONTRIBUTING TO EUROPEAN TARGETS

**JP Hydropower EERA, Brussels**

**September 9th 2019**

Tone Knudsen

Corporate R&D



# Europe's largest producer of renewable energy

OWN CAPACITY

**19 300 MW**

PRODUCTION

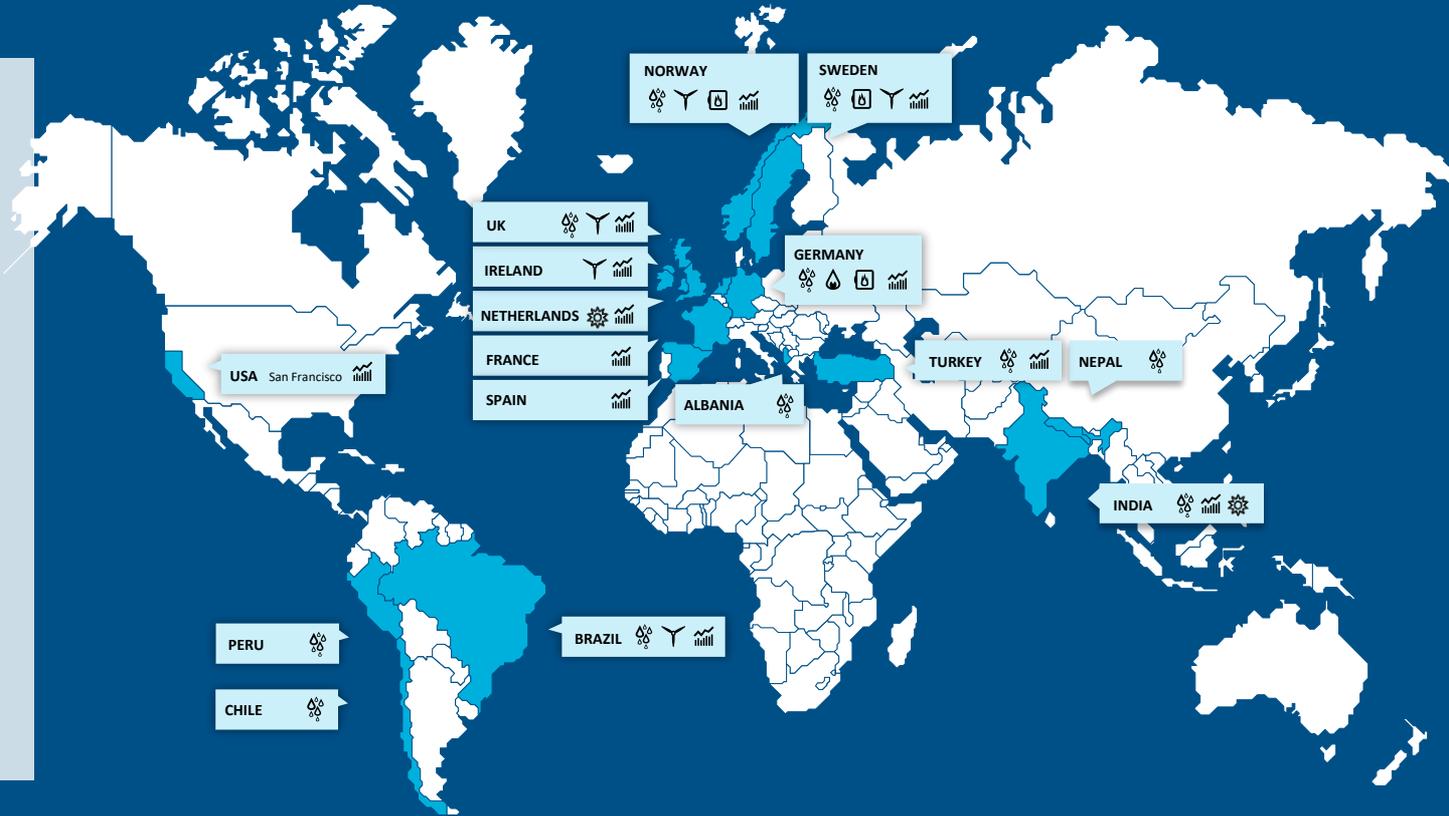
**62 TWh**

EMPLOYEES

**3 600**

NET PROFIT

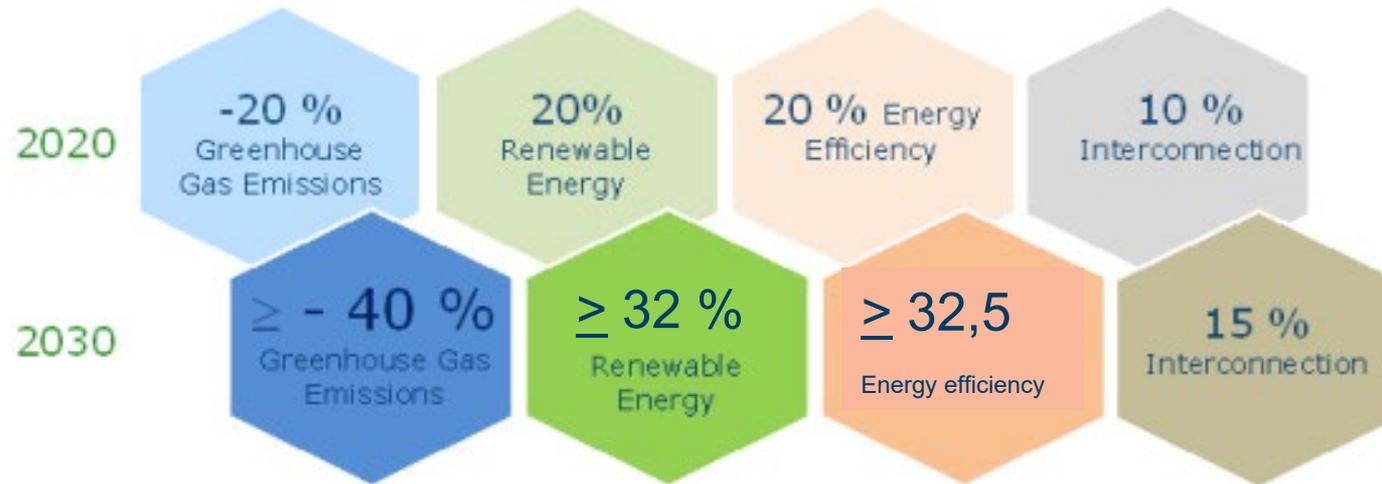
**13.4 NOK billion**





# EU climate and energy targets

## 2030 Framework for Energy and Climate - Agreed headline targets



# Horizon Europe: Preliminary structure



**Pillar 1**  
Excellent Science



**Pillar 2**  
Global Challenges and  
European Industrial  
Competitiveness



**Pillar 3**  
Innovative Europe

## THE VISION:

- ✓ Tackling climate change
- ✓ Achieve SDG's
- ✓ Boost EU competitiveness and growth

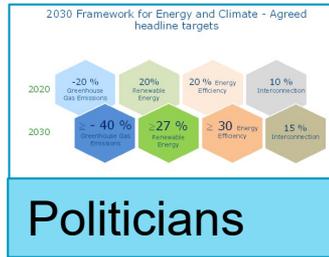


**Widening Participation and Strengthening the European Research Area**

Widening participation and spreading excellence

Reforming and Enhancing the European R&I system

# Shaping EU research agenda: Horizon Europe



Horizon Europe: Preliminary structure



Bureaucrats



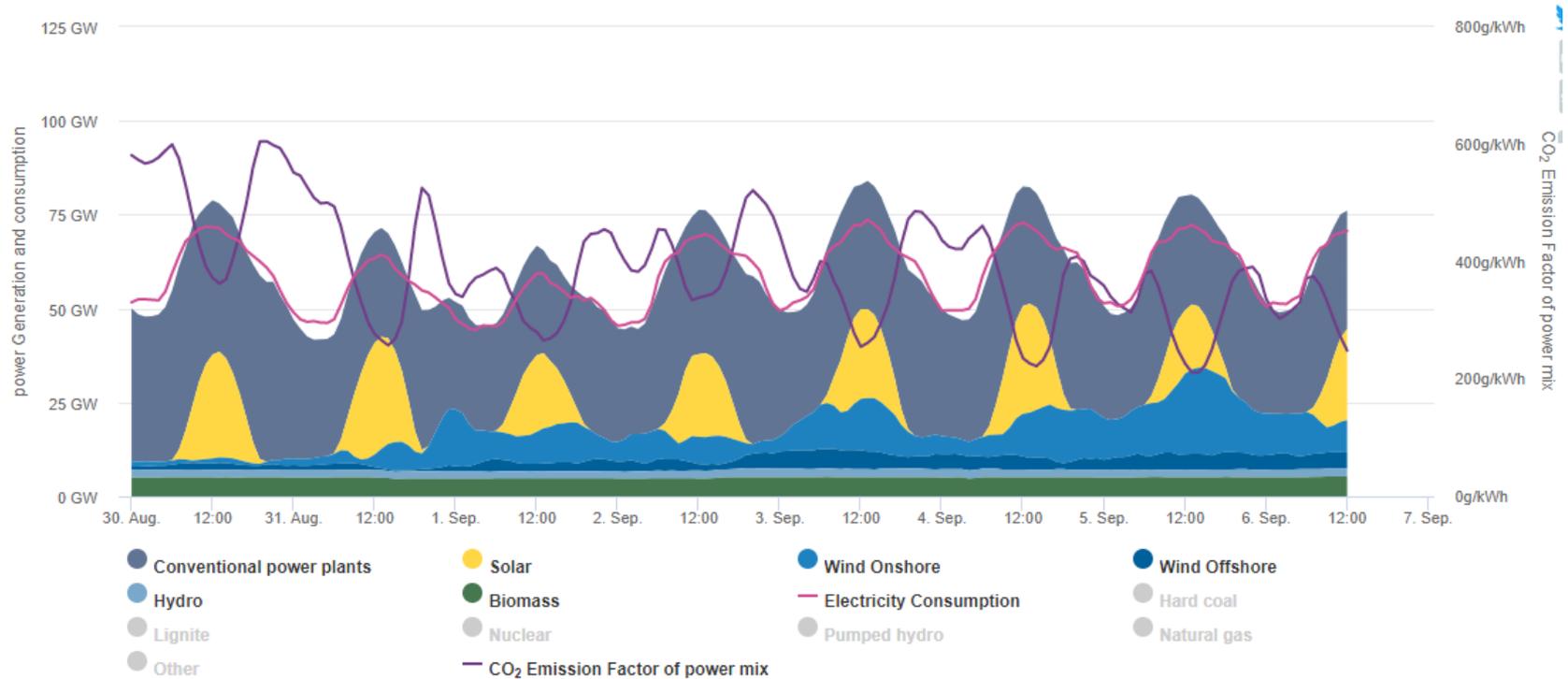
**Why your project now?  
What if we do not do your proposal?**

Research



# Ex: Germany September 2019

## Power Generation and Consumption



# Increasing need for flexibility - numerous solutions

	Hydro	Consumer respons	Batteries	Intercon./ grid	Gas/Coal
Balancing (0 -1 hr)	✓	✓	✓	✓	✓
Intra day (1 – 24 hrs)	✓	✓	✓	✓	✓
Intra week (1 – 7 days)	✓			✓	✓
Base load (> 1 week)	✓				✓

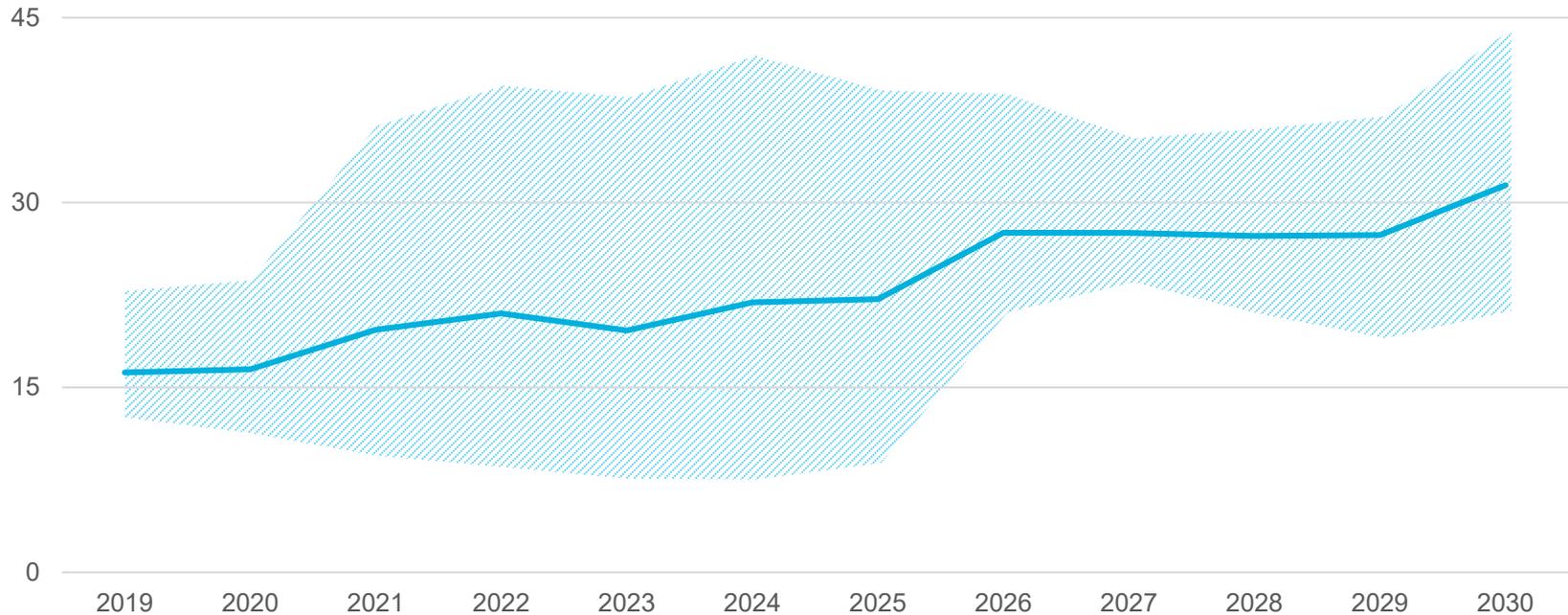
# VALUE OF FLEXIBILITY

An aerial photograph of a large, curved dam made of grey stone or concrete, situated in a rugged, mountainous landscape. Behind the dam is a large reservoir of blue water. The surrounding terrain is rocky and covered with patches of green moss or low vegetation. In the distance, more mountains and a valley are visible under a cloudy sky. A white rectangular box is overlaid on the image, containing the text 'VALUE OF FLEXIBILITY' in bold, black, sans-serif capital letters.

# Nordic challenge: Substantial power surplus

## Power surplus, forecast

TWh



# Future threats and opportunities for hydro

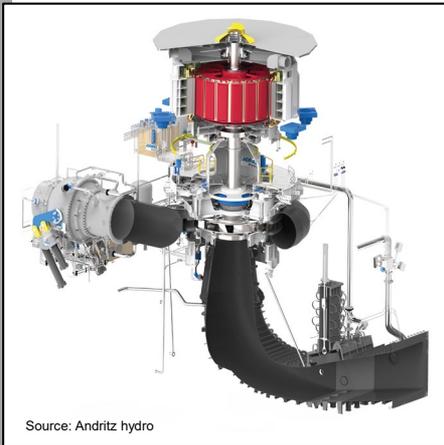


More  
unpredictable  
waterflow

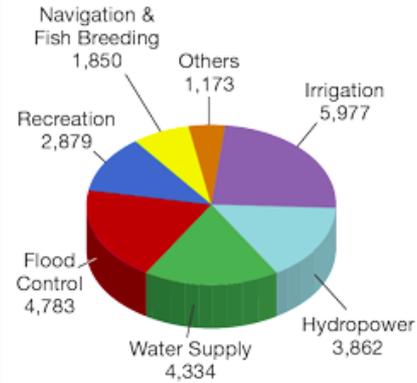


Ageing  
assets

Opportunity  
to redesign  
assets



Changing  
Regulations  
WFD



Multi  
purpose  
hydropower

# Corporate strategy defines R&D priorities

**OPTIMISE HYDRO-  
POWER PORTFOLIO**



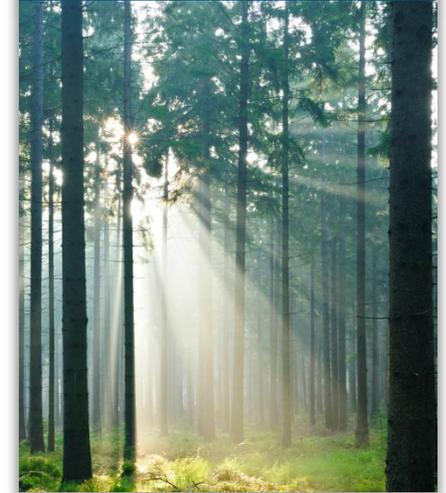
**RAMP UP AS WIND  
AND SOLAR DEVELOPER**



**GROW THE  
CUSTOMER BUSINESS**



**DEVELOP NEW  
BUSINESS INITIATIVES**

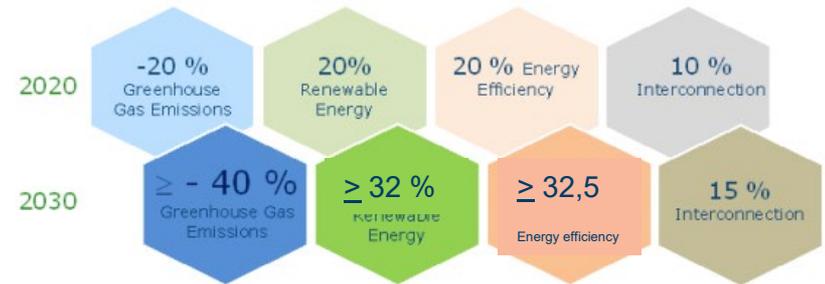


# Hydro R&D helps Europe reach its targets



- ▶ **Continuously improve O&M**
  - Life prolonging measures on ageing assets and climate adaptation
- ▶ **Hydropower flexibility solutions**
  - Main focus on large reservoirs and improving possibilities for delivering on both long and short term
- ▶ **Regulatory issues**
  - Environmental effects and dam safety
- ▶ **Market design**
  - Value of flexibility
- ▶ **Interconnection technology**
  - Nordic hydropower delivering to continental Europe

## 2030 Framework for Energy and Climate - Agreed headline targets





# THANK YOU

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PURE ENERGY

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