



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

# **Excellence in European energy research – An NTNU perspective**

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# Content

- Background information on NTNU
- Energy as a strategic research area at NTNU
- NTNU's international strategic energy partnerships
- NTNU's International action plan
- NTNU as a partner in European Energy Research
- Concluding remarks

# NTNU Facts

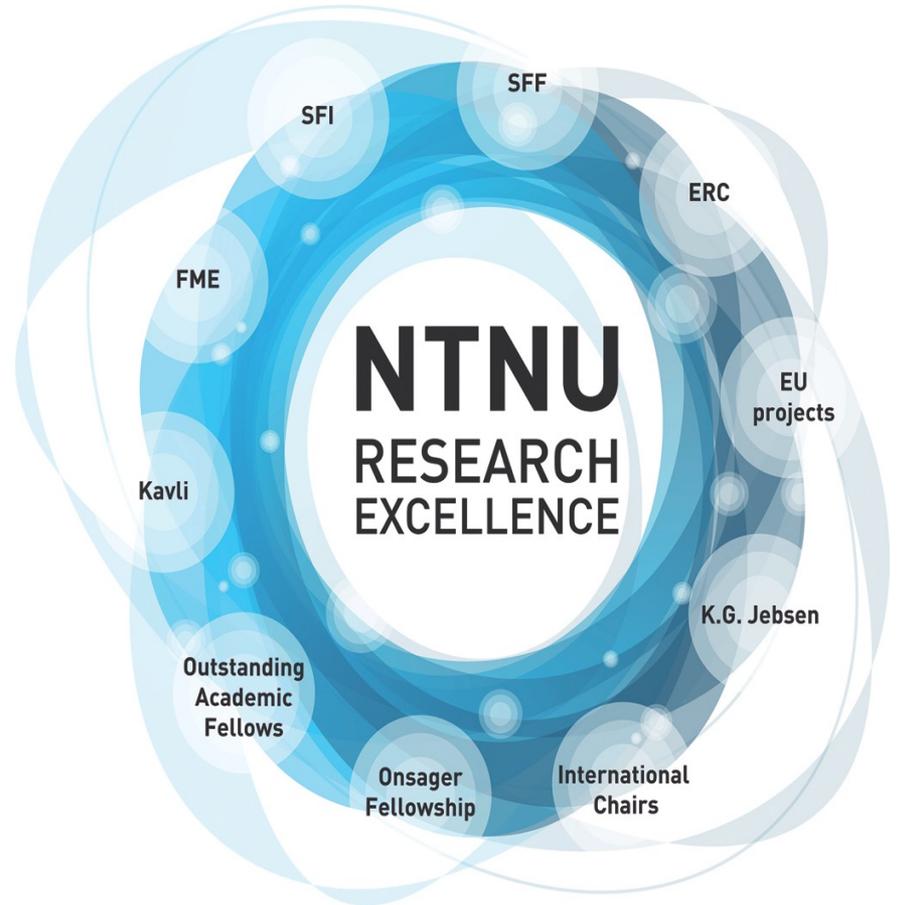
- After merging in 2016, the largest university in Norway
- 14 faculties and 70 departments (2016) covering:
  - **Technology, natural sciences**, humanities, social sciences, economics, medicine, health sciences, education, architecture, entrepreneurship, and fine and performance arts.
- 39000 students and more than 4000 FTE in teaching research and outreach positions (39% female)
- 120 laboratories - some owned jointly with SINTEF
- 340 doctoral degrees awarded (2015)

# Research

- Four strategic thematic research areas (TSOs)
- Three strategic technology areas (ICT, Nano, Bio)
- **Four Norwegian Centres of Excellence (SFF)**
- Host institution for seven, partner in **eight Centres for Research-based Innovation (SFI)**
- Host institution for two, partner in **six Research Centres for Environment-Friendly Energy (FME)**
- Approximately 120 research laboratories
- Several other large research programmes



- NTNU also hosts the **Kavli Institute for Systems Neuroscience**, as well as a wide range of research schools.
- We work in close partnership with SINTEF, one of Europe's largest independent research institutes. Together, NTNU and SINTEF are responsible for six national research centres for eco-friendly energy (FMEs).
- Researchers at NTNU have also received several grants from the European Research Council (ERC).



# STRATEGIC RESEARCH AREAS 2014–2023

 NTNU  
Norwegian University of  
Science and Technology



ENERGY



HEALTH



OCEANS



SUSTAINABILITY

# Strategic area Energy: Facts & Motivation

- A strategic area at NTNU since 2000
- NTNU's largest strategic area (TSO):
  - 6 of 7 “old” (pre-merger) NTNU faculties involved
  - 30 departments/at least 60 research groups
- Created
  - ... to facilitate **multi-disciplinary research** across faculties
  - ... to benefit from some of NTNU's major strengths:
    - Work on the **entire technology chain** from source to end user
    - Combination of technology, societal research, and humanities
  - ... to facilitate **international collaboration**
    - ... in research
    - ... in education
- Enhanced **coordination of national initiatives**

# Energy education@NTNU

## MSc programmes (in English)

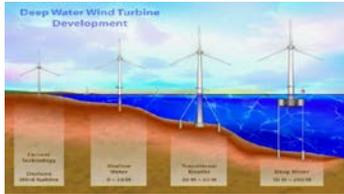
- Industrial Ecology
- Electric Power Engineering
- Natural Gas Technology
- Petroleum Engineering
- Sustainable Energy
- Hydropower Development
- Innovative sustainable Energy Engineering
- EWEM – European Wind Energy Master

## Degree programmes in Norwegian (samples)

- Energy and Environment
- Civil and Environmental Engineering
- Materials Technology
- Marine Technology

About 400 MSc students in energy related fields each year

# Overview of TSO Energy's focused activities (I)



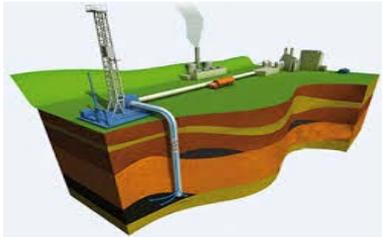
Off-shore Wind



Hydro Power



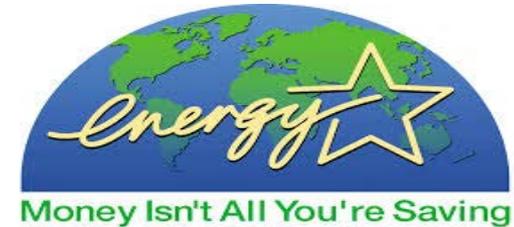
Smart Energy Systems/Smartgrids



Carbon Capture and Storage (CCS)



Smart Cities

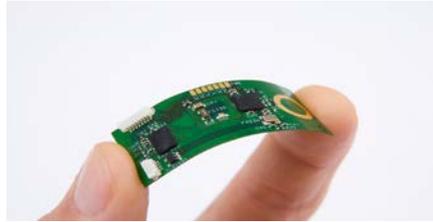


Energy Efficiency

# Overview – Focused Activities (II)



**Solar Power (PV)**



**Nano Technology**



**Energy Efficiency  
Marine Transport system.**



**Politics, innovation  
public engagement -  
sustainable energy**

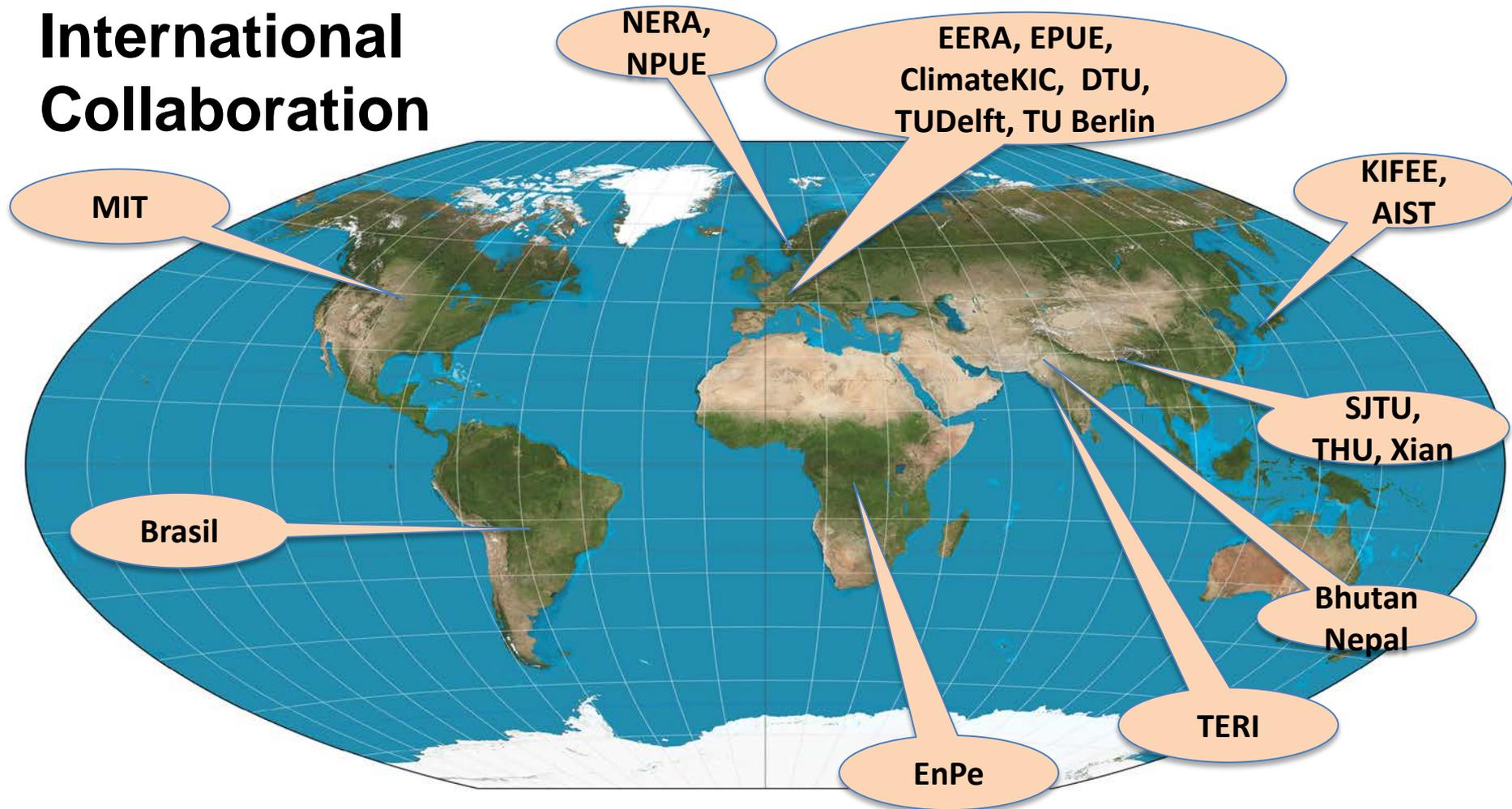


**Energy Storage**



**Petroleum Research**

# International Collaboration



# NTNU's International Action Plan - Goals

- Strong participation within:
  - EU's Framework Program Horizon 2020 - Research
  - ERASMUS+ (Cooperation in Education)
  - European Research Council (ERC)
  - Knowledge and Innovation Communities (KICs)
- Cooperation with outstanding international research groups
- Cooperation with developing countries
- International mobility
  - Students
  - Researchers
- Internationalization of study programs



# European Energy Research Alliance EERA: NTNU Mirror Organization

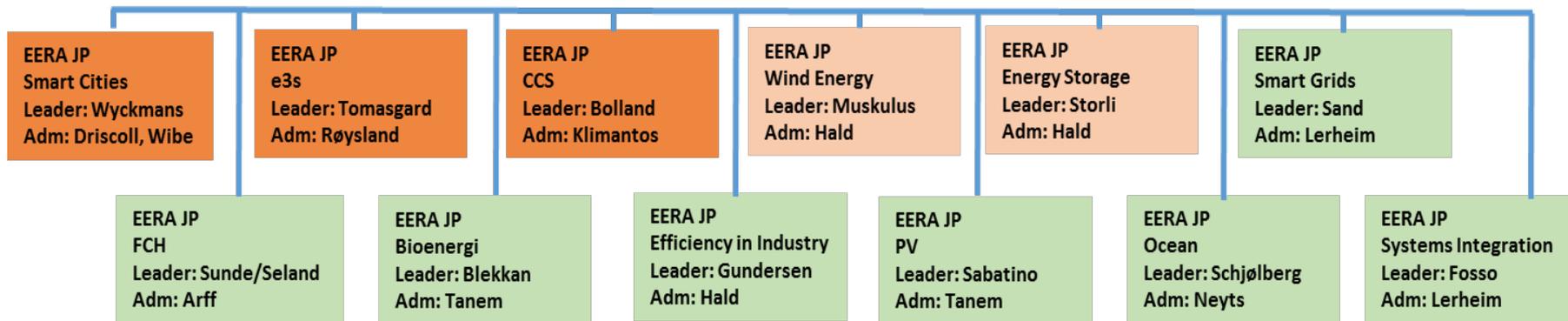
## NTNU EERA Leader Group

Leaders: Olav Bjarte Fosso and Massimo Busuoli  
EERA JP NTNU Leaders

NTNU EERA JP  
- full member

NTNU EERA JP  
- associate member

NTNU EERA JP  
- not member  
- relevant JPs



# Concluding remarks

- NTNU aims high for international participation in:
  - Research
  - Education
- A core of the internationalization strategy is to enter into strategic partnerships with outstanding universities
- Mobility of students and staff is prioritized
- Instruments developed under the EU Framework will be particularly focused
- EERA is essential, and a mirror organization is created to facilitate participation within the multi-disciplinary activities



***THANKS FOR YOUR ATTENTION***

Information: <http://www.ntnu.edu/energy>