



**Norwegian research and innovation centre for hydrogen and ammonia**

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# FME HYDROGENi in short

- Centre for environmentally-friendly energy (FME)
- 8 years (5 + 3 years), starting 2022 (~ September)
- Host institution: SINTEF Energy
- Research partners: SINTEF, NTNU, UiO, IFE, USN, UiT
- Industrial partners: More than 50; large, multi-national and small (SMEs)
- Budget: ~540 MNOK (~55 M€), 200 MNOK in public support from RCN
- 35 PhD/postdoctoral fellowships

Oppretter to nye forskningscentre på hydrogen

SINTEF og NORCE får hvert sitt forskningscenter, og mottar til sammen 310 millioner kroner for å styrke Norges forskningsinnsats på hydrogen de neste åtte årene.

Pressemelding | Publisert 11. mar 2022

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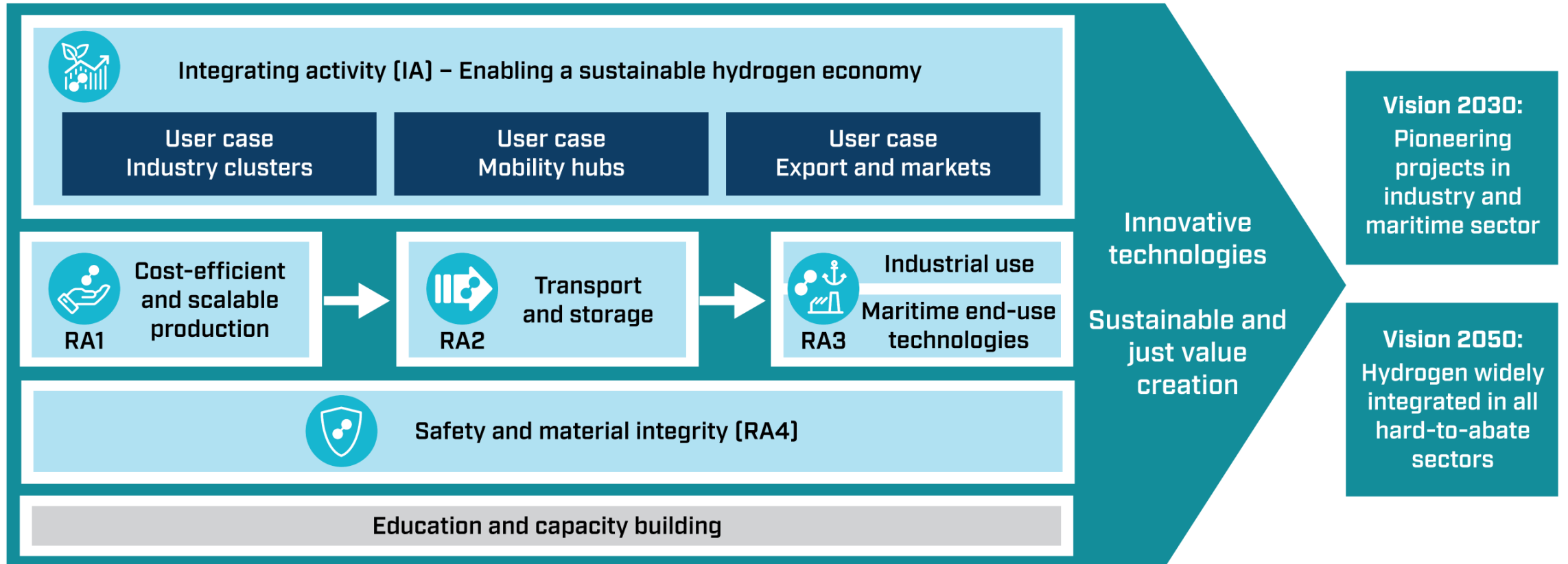


Regjeringen har ambisjoner om at Norge skal ta på seg ledertøyen i teknologutviklingen på hydrogen og hydrogenbaserte energibærere. Forskningsrådet tildeler 310 millioner kroner til to nye sentre ved SINTEF og NORCE. Foto: Margrete Lobben Hanssen/OED

# FTE HYDROGENi – strong partnership



Supporting partners: **inovyn** **Statnett** **SUSTAINABLE ENERGY** **NORWEGIAN CATAPULT CENTRE**





# RA1 – Cost efficient and scalable production

- WP 1.1 – Green H<sub>2</sub> production
  - Materials and manufacturing for optimum performance and durability
  - Efficiency and dynamic behaviour of electrolysers
  - Design, operation and process integration of large-scale electrolysers
- WP 1.2 – Blue H<sub>2</sub> production
  - Reforming concepts
  - Smelter off-gas handling
  - Advanced H<sub>2</sub>/CO<sub>2</sub> separation technologies
- WP 1.3 – NH<sub>3</sub> production and cracking
  - Integrated production
  - NH<sub>3</sub>-cracking catalysts
  - Membrane-enhanced NH<sub>3</sub> cracking

RA1 lead  
[Marie-Laure Fontaine, SINTEF](#)







# RA2 – Transport and storage

- WP 2.1 – Liquid H<sub>2</sub> technologies
  - H<sub>2</sub> liquefaction
  - Magneto-caloric materials
  - Quantification of efficiency and scalability of H<sub>2</sub> liquefiers
  - Assessment of measurement principles
- WP 2.2 – Storage
  - Metal hydrides
  - Geological formations
  - Gas hydrates
- WP 2.3 – Maritime and pipeline transportation
  - Maritime distribution network
  - H<sub>2</sub>/NH<sub>3</sub> fleet and its operational patterns
  - Novel ship designs
  - Upgraded fit-to-purpose port infrastructure
  - Pipeline transportation

RA2 lead  
[Petter Nekså, SINTEF](#)





# RA3 – End-use technologies

- WP 3.1 – Industrial use
  - Industrial heat
  - H<sub>2</sub> as reducing agent
- WP 3.2 – Maritime H<sub>2</sub>/NH<sub>3</sub> technologies
  - Fuel-cell stacks and systems
  - Internal combustion engines
  - System integration and hybridization

RA3 lead  
[Øystein Ulleberg,](#)  
[IFE](#)





# RA4 – Safety and material integrity

- WP 4.1 – Material integrity
  - H uptake and diffusion
  - Critical degradation mechanisms
  - Lifetime assessment
  - Polymer ageing
- WP 4.2 – Safety and risk assessment
  - Risk-management framework
  - Frequency analysis
  - Physical phenomena

RA4 lead

[Nicola Paltrinieri,](#)  
[NTNU](#)







## Integrated capacity building programme (35 PhD and postdoctoral fellowships)

Responsible: Prof. Hilde J. Venvik  
(+research advisor Thais Mothe-Diniz)

Institutions involved: NTNU, UiO, USN, UiT

Key elements:

- ✓ Integration/interaction with the relevant WPs and industrial partners
- ✓ Internationalization and scientific excellence; scientific committee and international advisors, HySchool
- ✓ Team efforts and exchange of experience, competencies, results and best practices



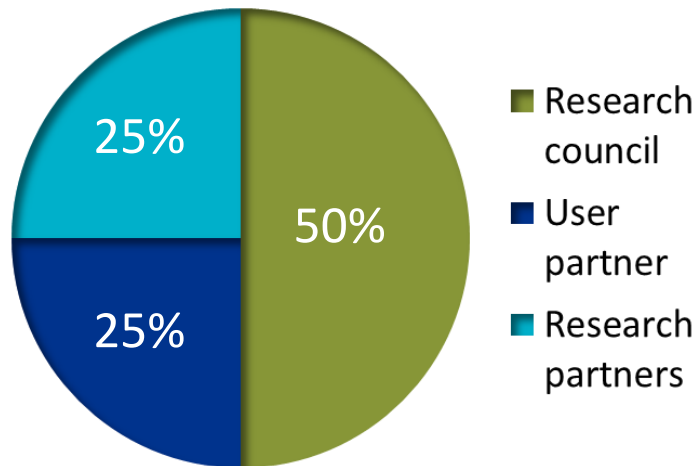
# **HYDROGENi** A successful outcome will:

Accelerate a hydrogen-based energy and technology export industry for Norway, reducing emissions while boosting industry competence and creating new green jobs.

- *Enable cost-effective and large-scale  $H_2$  and  $NH_3$  production technologies*
- *Enable  $H_2$  storage and transport for emerging large-scale and high-energy demand applications*
- *Enable end use of clean  $H_2$  and  $NH_3$  in hard-to-abate sectors, including industry and maritime transport*
- *Develop new knowledge on critical aspects of safety, material integrity & standards*
- *Stimulate innovation, industrial establishment and uptake of new technology and solutions through industry-driven user cases*
- *Build capacity for the hydrogen economy*

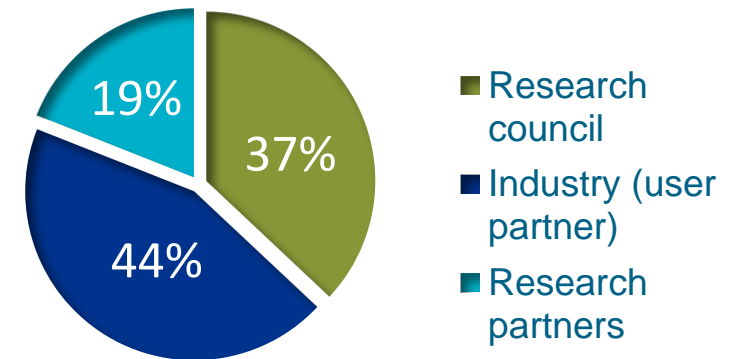
### General funding contribution model

- Research council:
  - maximum 50%
  - allows up to 25 MNOK per year
- Industry (user) partners: minimum 25%



### Funding of FME HYDROGENi

- 25 MNOK per year from the Research Council of Norway
  - ca. 37% of total funding
- Cash and in-kind funding from industry and R&D partners ca. 63%







**Centre Director**  
Nils Røkke,  
SINTEF



**Integrated capacity  
building programme**  
Hilde J Venvik, NTNU



**Scientific  
Committee co-lead**  
Bjørn Hauback, IFE



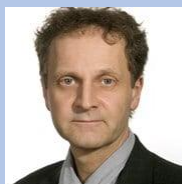
**Scientific  
Committee co-lead**  
Anja Sjøstad, UiO



**RA1 lead**  
Marie-Laure  
Fontaine, SINTEF



**RA2 lead**  
Petter Nekså,  
SINTEF



**RA3 lead**  
Øystein Ulleberg,  
IFE



**RA4 lead**  
Nicola Paltrinieri,  
NTNU



**Co-Director**  
Kyrre Sundseth,  
SINTEF



**Co-Director**  
Stefania Gardarsdottir,  
SINTEF



**Co-Director**  
Trond Johnsen,  
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**International  
Liaison Manager**  
Steffen-Møller-Holst,  
SINTEF





# **HYDROGEN**

Thank you for your attention!