

# CINeLDI

**Centre for intelligent electricity distribution**  
- to empower the future Smart Grid



Centres for  
Environment-friendly  
Energy Research



# CINELDI is one of the Centres for Environment-friendly Energy Research in Norway (FME)

## Technology-oriented FME centres

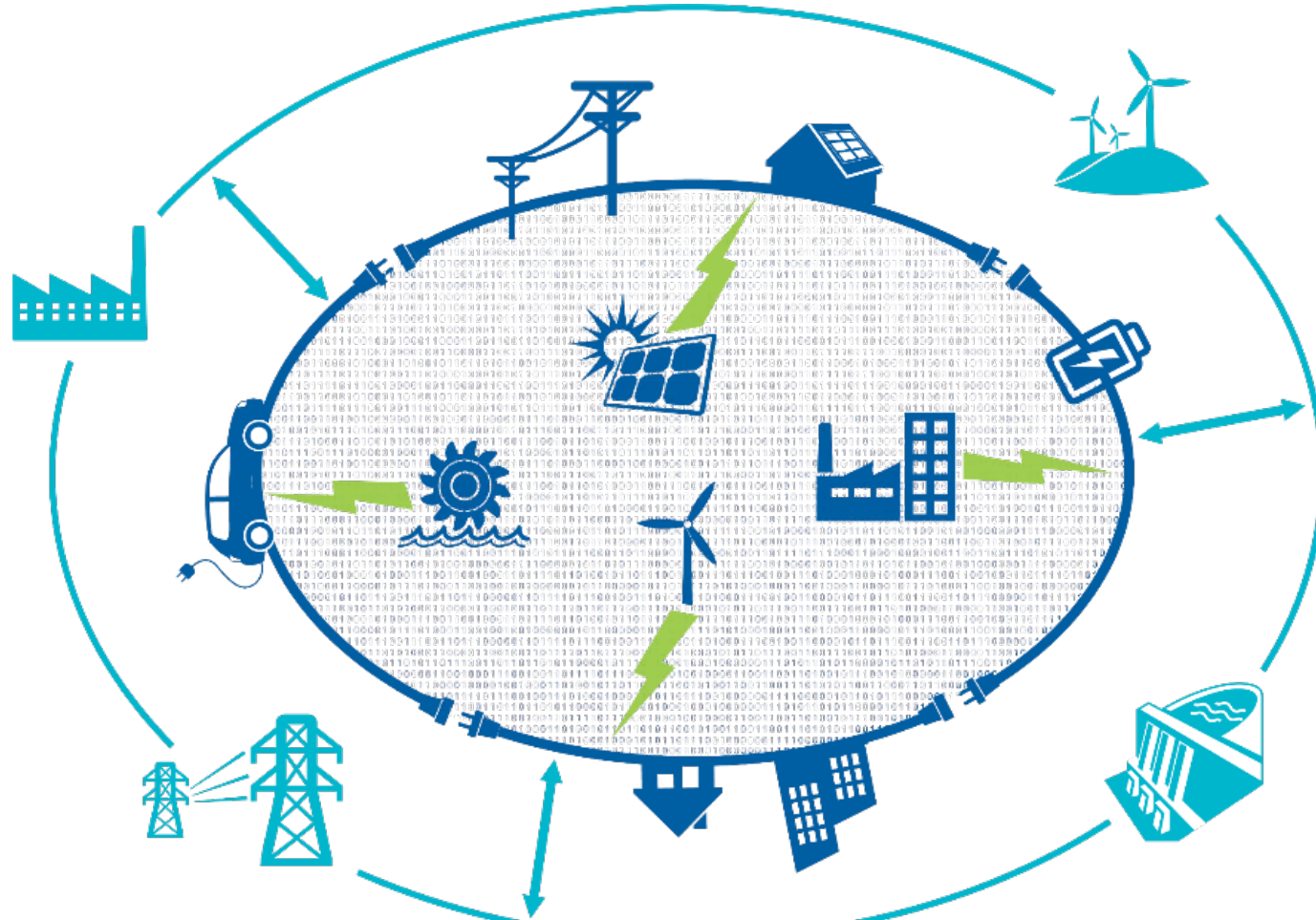


## Social science-related FME centres



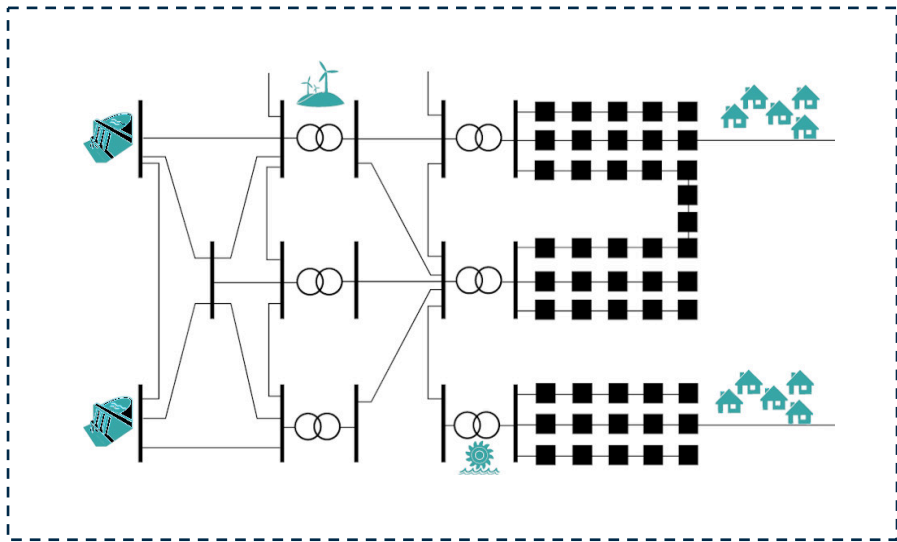


# CINELDI develops the electricity grid of the future



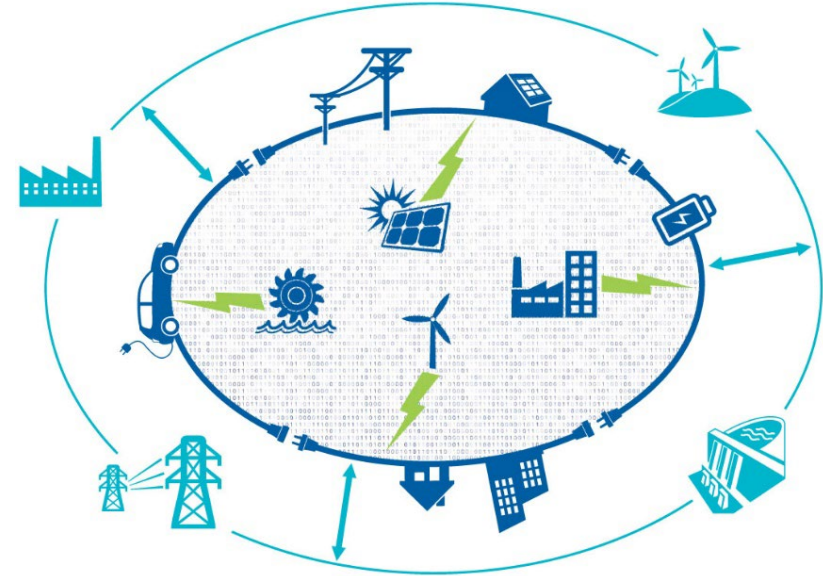
# CINELDI facilitates the transition to the future flexible, intelligent and robust distribution grid

The current power system



Power flow direction

The future power system



Flow in both directions



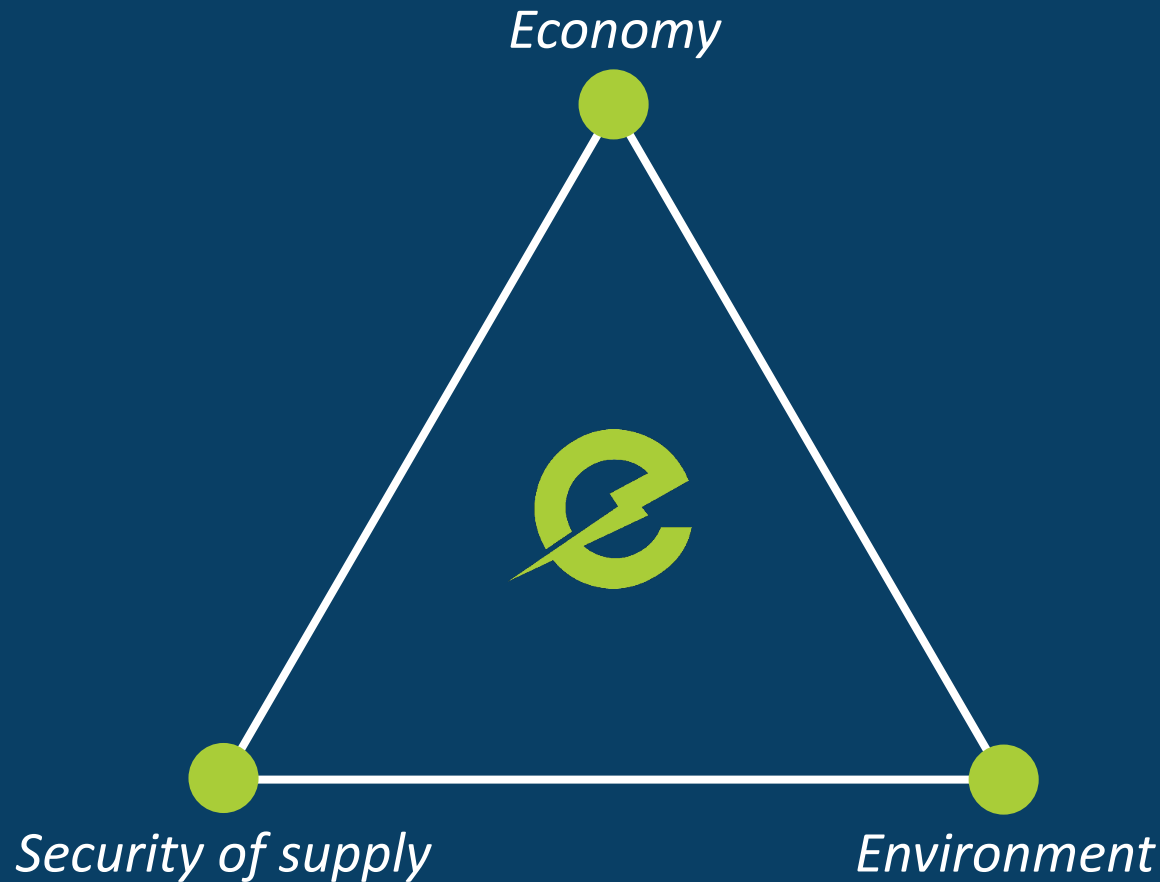


# CINELDI Mission

CINELDI works towards digitalising and modernising the electricity distribution grid for higher efficiency, flexibility and resilience.



# CINELDI's Main goal: a sustainable grid



To enable and facilitate a cost-efficient realisation of the future flexible and robust electricity distribution grid.



# CINELDI Main Deliverables (1)

- Decision support methodologies and tools needed for the optimal planning and asset management of the future system.
- New cost-effective concepts and solutions for smart operations based on new emerging control and monitoring technologies and extensive real time monitoring.
- Methods and models for cost-effective integration of flexible resources in smart distribution grids, including business models on how to utilise this flexibility.
- New concepts and solutions for utilising flexible resources in ancillary services and for increased observability between the distribution and transmission systems
- Microgrid concepts, technologies and solutions for optimal design, operation, and integration with the distribution system.
- Roadmap and recommendations for the transition to the intelligent electricity distribution system of 2030-2040 in Norway.





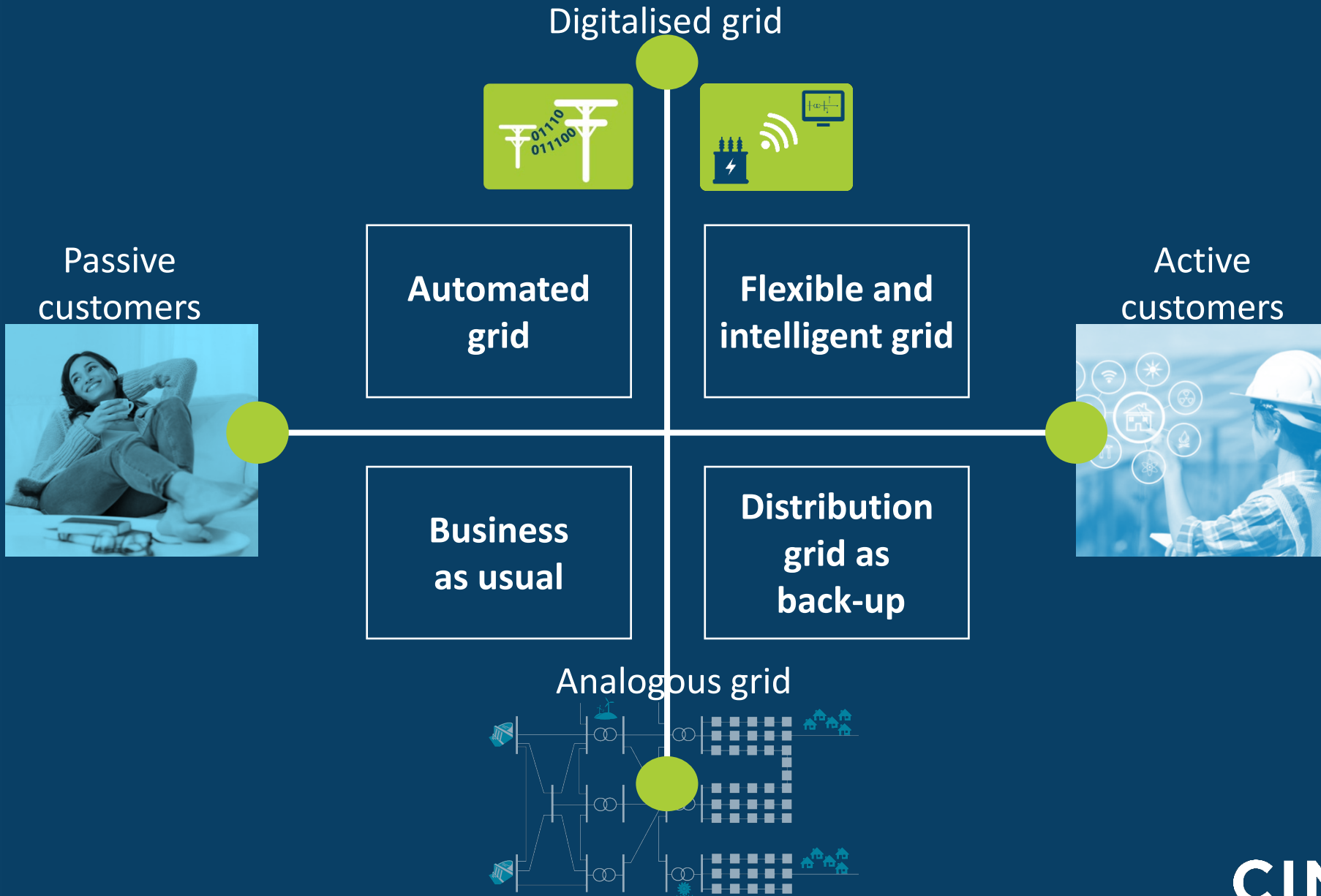
# CINELDI Main Deliverables (2)

- Knowledge base for grid owners and public authorities
- Training researchers and master students and transfer expertise to industrial stakeholders
- Efficient knowledge transfer through goal-oriented communication and user-involvement
- Facilitate business opportunities for technology providers by knowledge transfer
- Innovation opportunities for DSOs and TSO.





# Scenarios for the future distribution grid



# Research areas

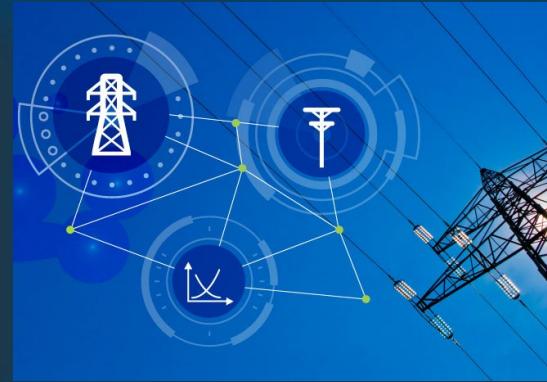
Smart grid development and asset management



Smart grid operation



Interaction DSO/TSO



Microgrids/ Local Energy Communities



Flexible resources in the power system



Smart grid scenarios and transition strategies





# Pilot projects supporting the research – in four thematic areas

**Fault handling and  
self-healing**



**Sensing and digital  
monitoring**



**Application of  
AMR/grid data**



**Flexibility**





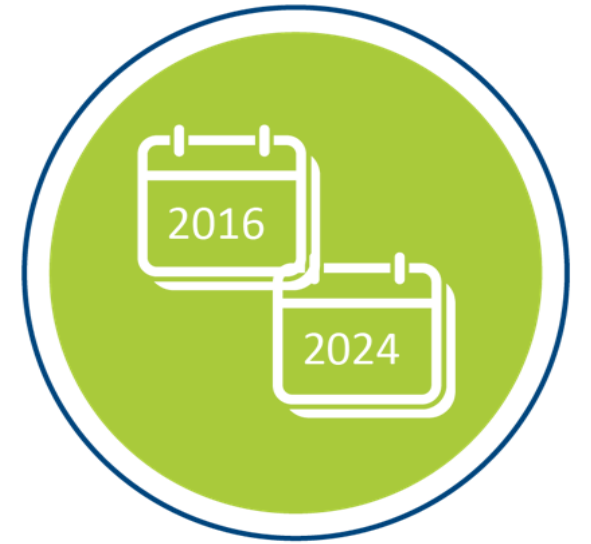
# CINELDI in figures



**30** PARTNERS



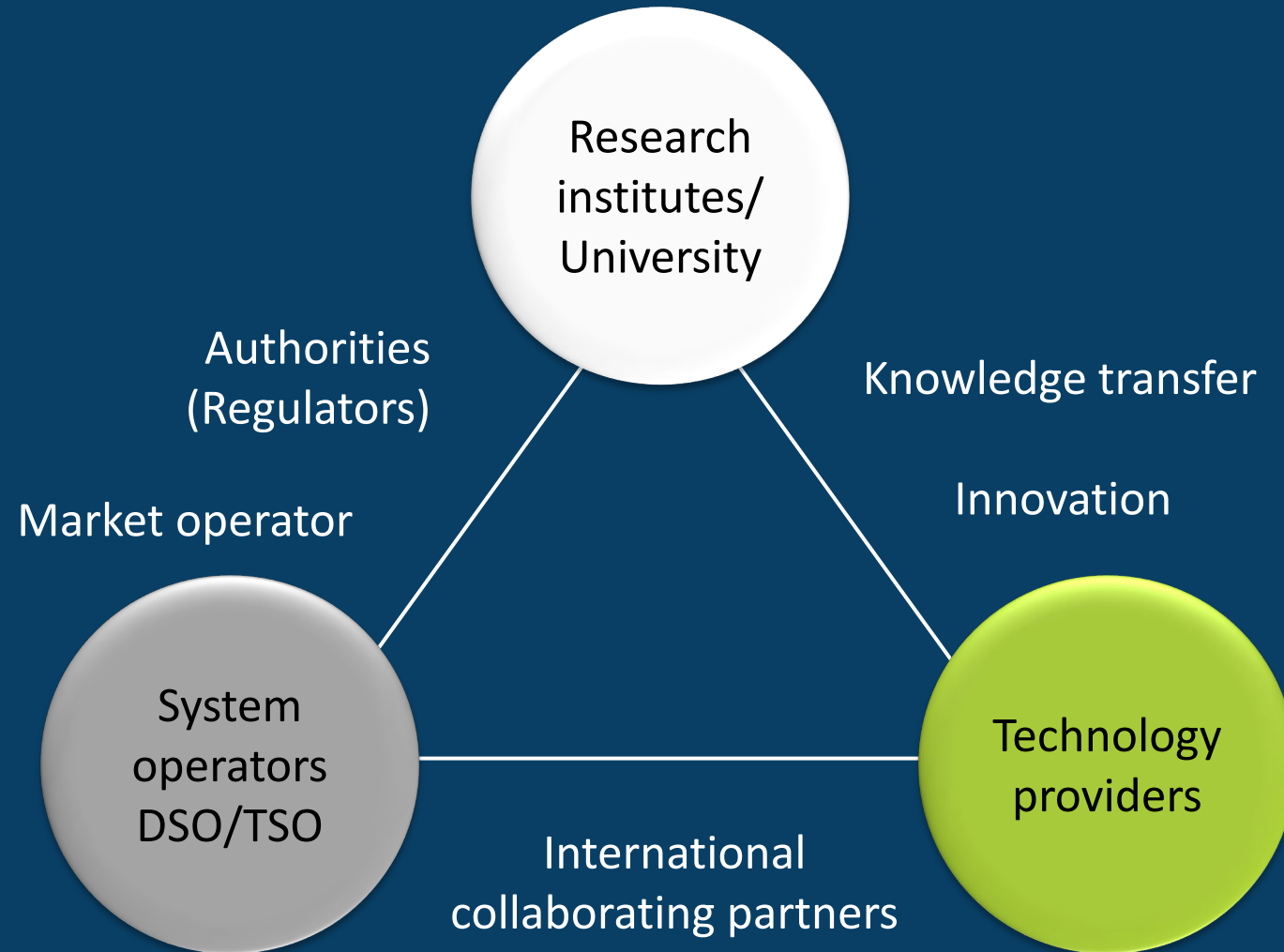
**369** MNOK



**8** YEARS



# CINELDI partners



# National partners



Glitre Nett



Elvia



elinett

lede



LINEA

Linja



Statnett

NODES



EmbriQ



Heimdall Power



Fornybar Norge

kraftCERT

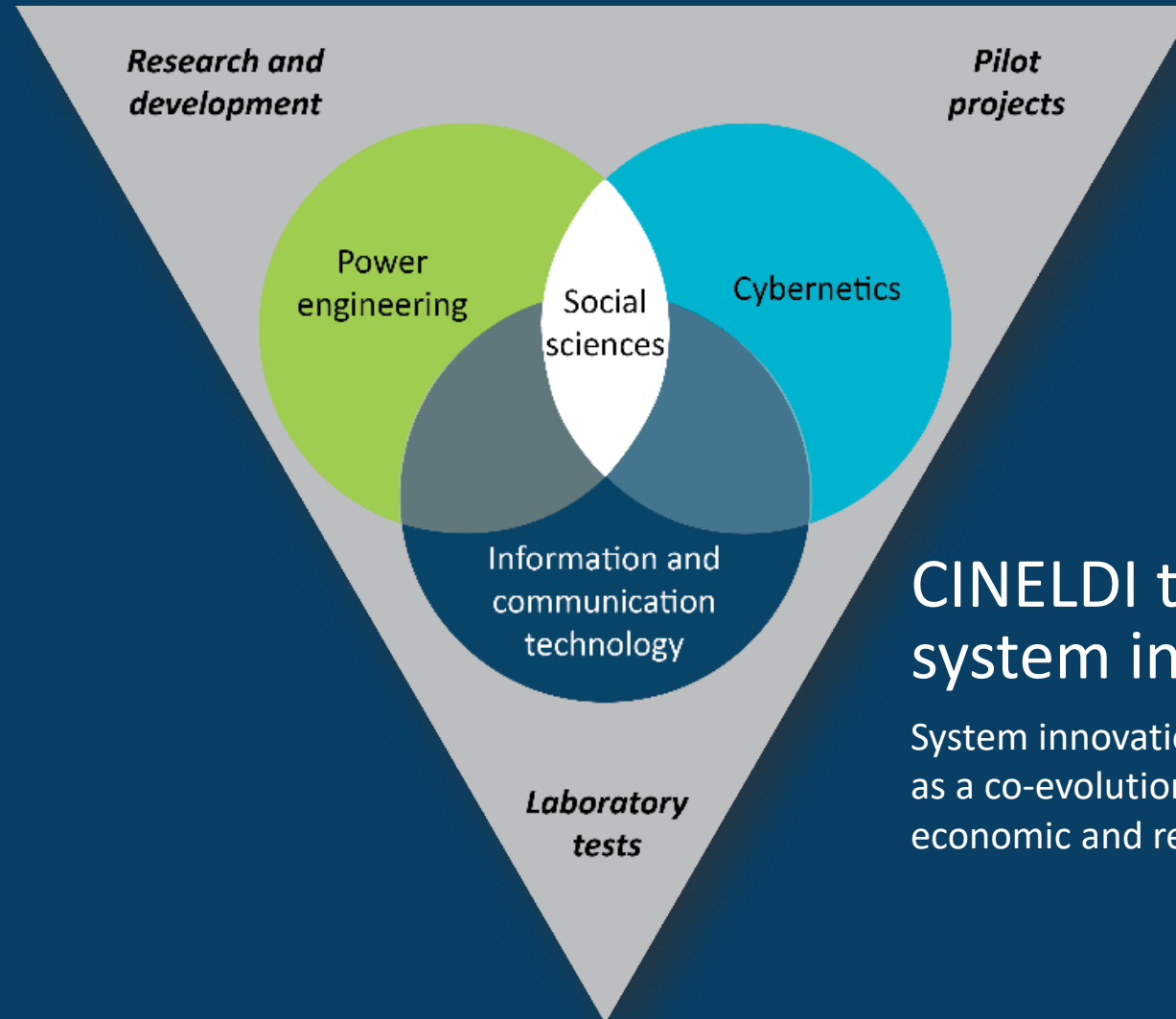


Nasjonal kommunikasjonsmyndighet





# Multidisciplinary research platform

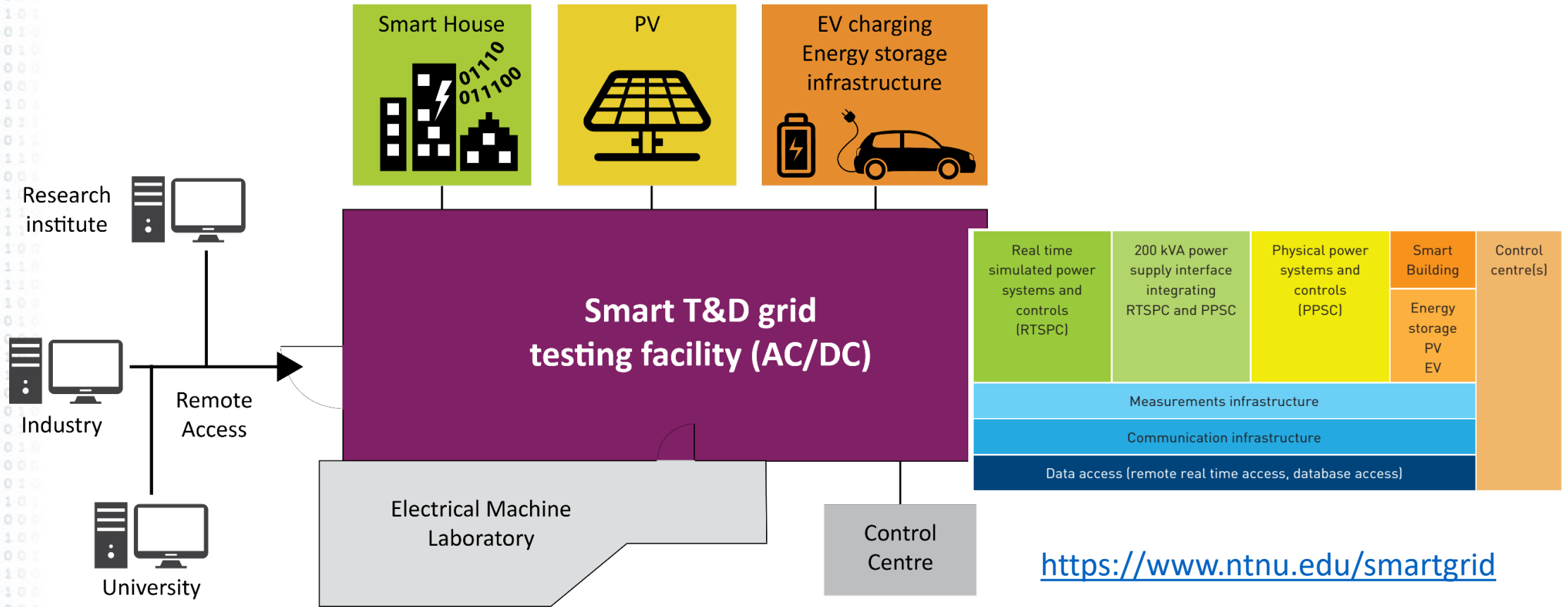


**CINELDI targets system innovation**

System innovation should be perceived as a co-evolution of technical, social, economic and regulatory change.



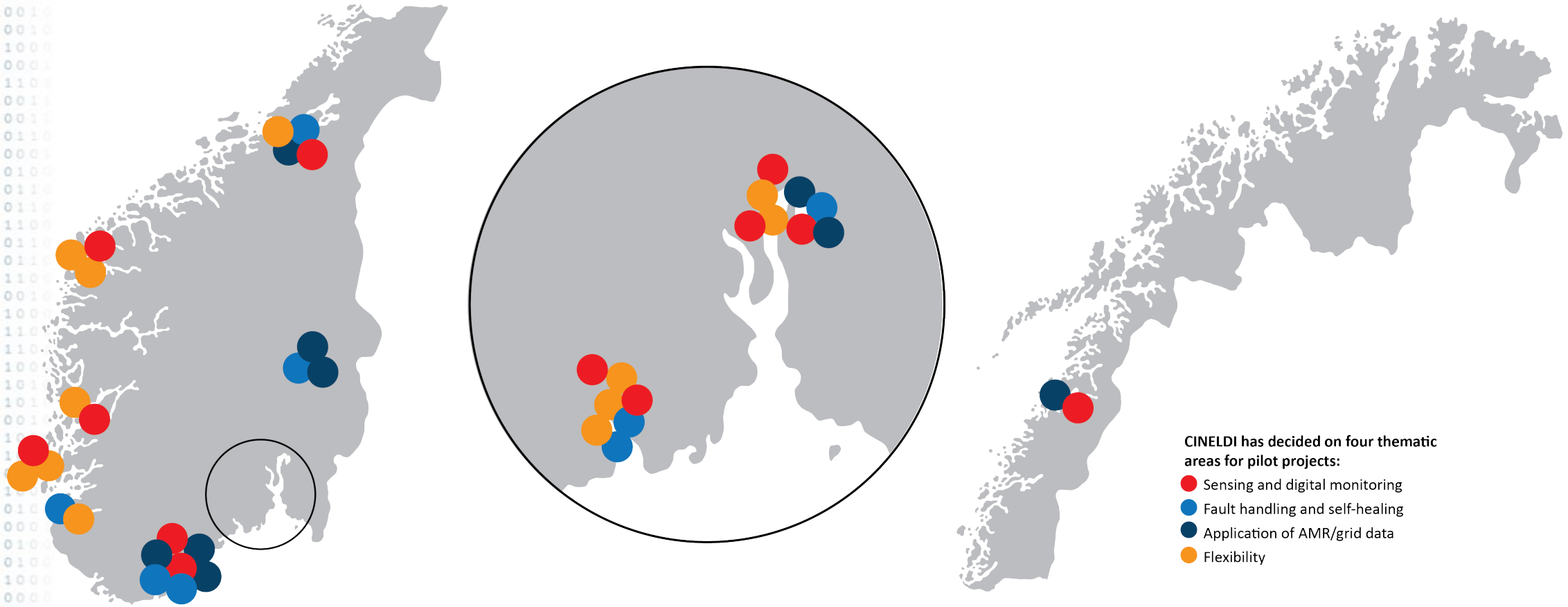
# The National Smart Grid Laboratory - an important asset in CINELDI



<https://www.ntnu.edu/smartgrid>

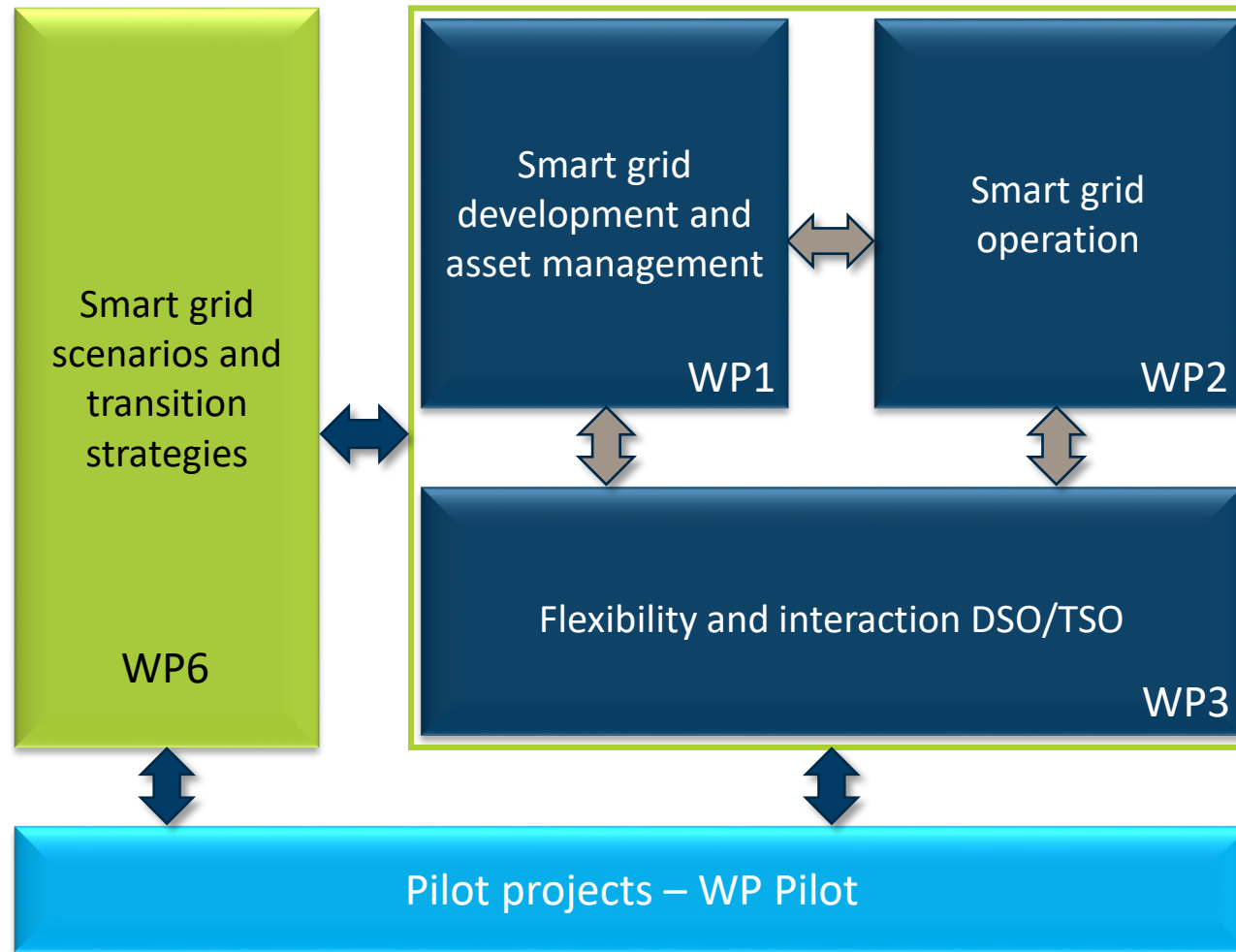


# ... as well as smart grid pilot projects and living labs

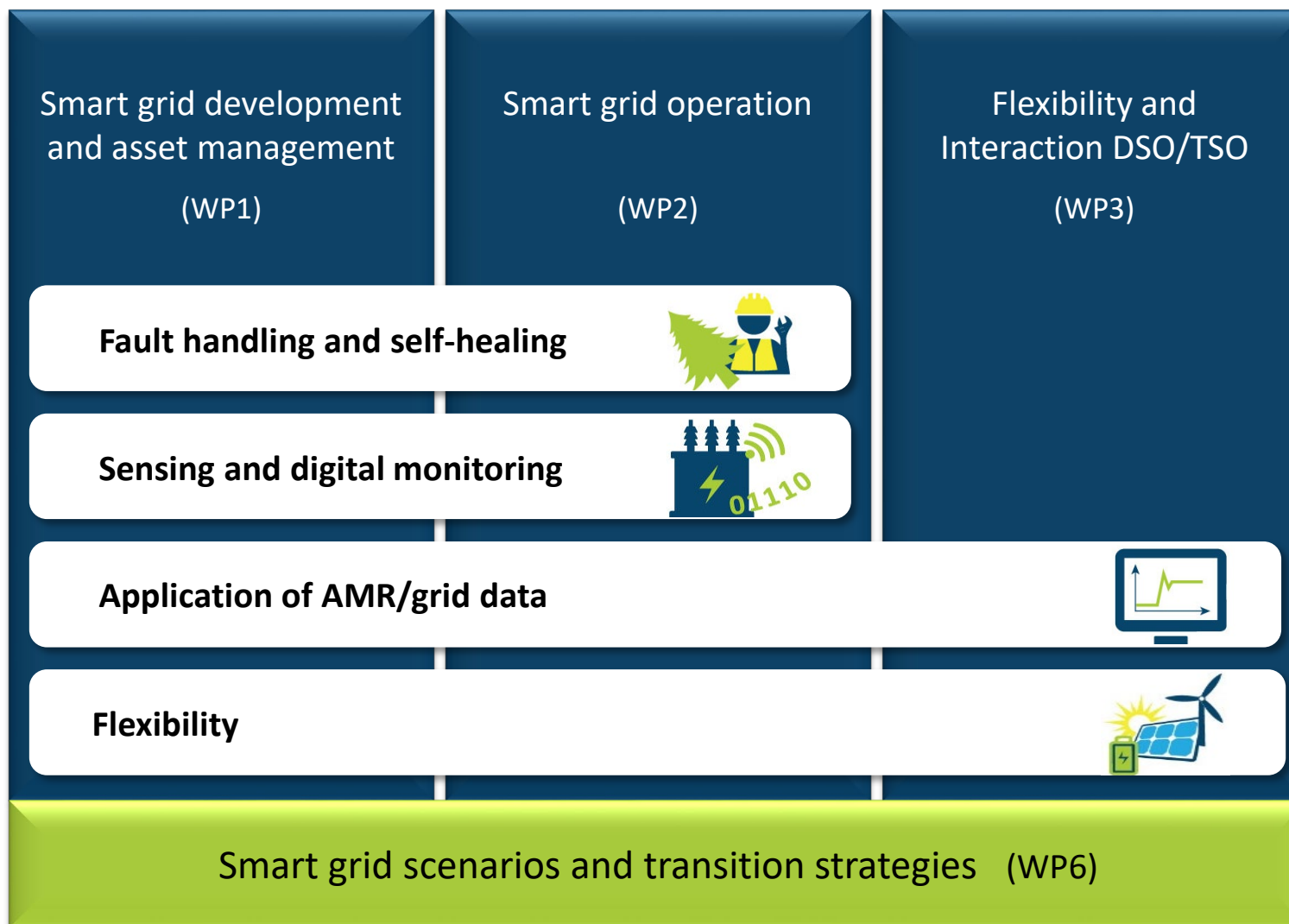




# Work packages



# Pilot projects in four thematic areas



# Researcher training and recruitment

CINELDI recruits masters, PhDs and Post doctors in the following disciplines:

- Electric power engineering
- Communication technology
- Information technology
- Automation/cybernetics
- Socio-economics
- Social science aspects of smart grids

CINELDI targets 20 PhDs/Postdocs and 150 Master projects

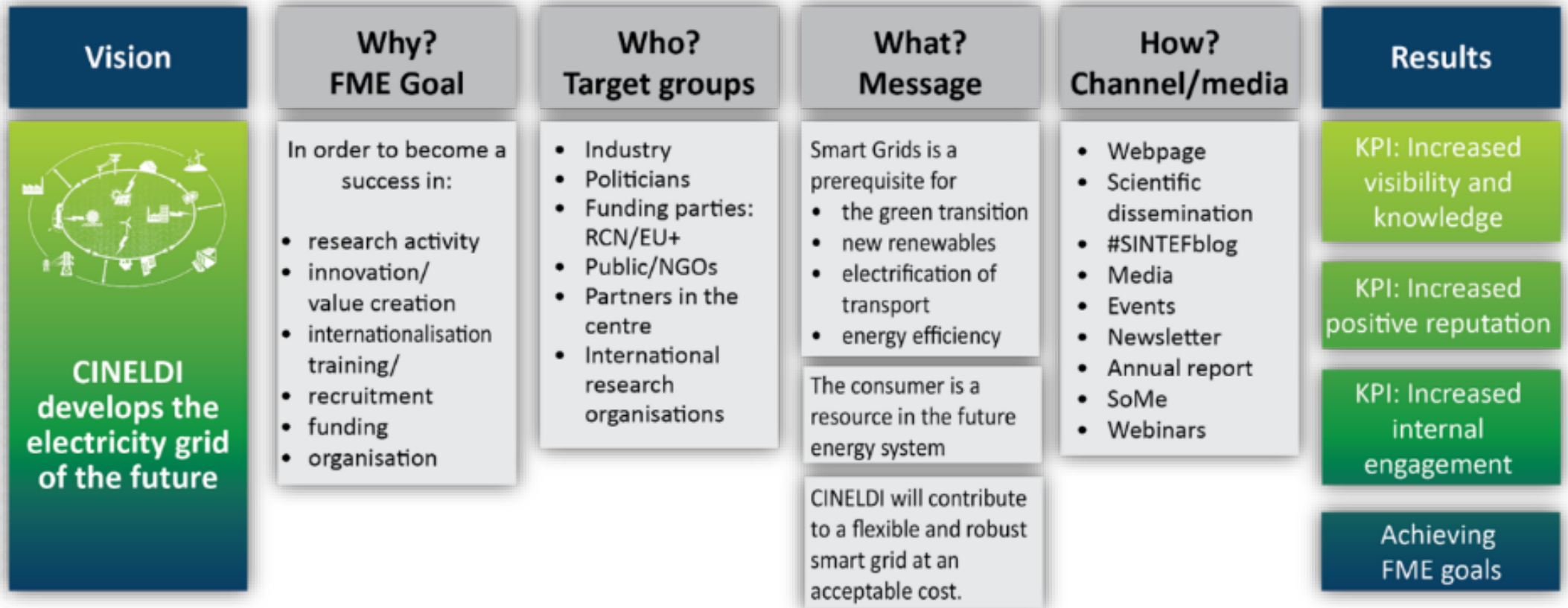


NTNU Energy Team Smartgrid  
<https://www.ntnu.edu/energy/smartgrid>





# Communication and outreach



# CINELDI's Knowledge base (cineldi.no)



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**CINELDI's Knowledge base** Publications Contact

**CINELDI is a centre for environment-friendly energy research**

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CINELDI enables a cost-efficient realisation of the future flexible and robust electricity distribution grid.



Smart grid development and asset management

Smart grid operation

Interaction TSO/DSO

Microgrids/local energy systems

Flexible resources in the power system

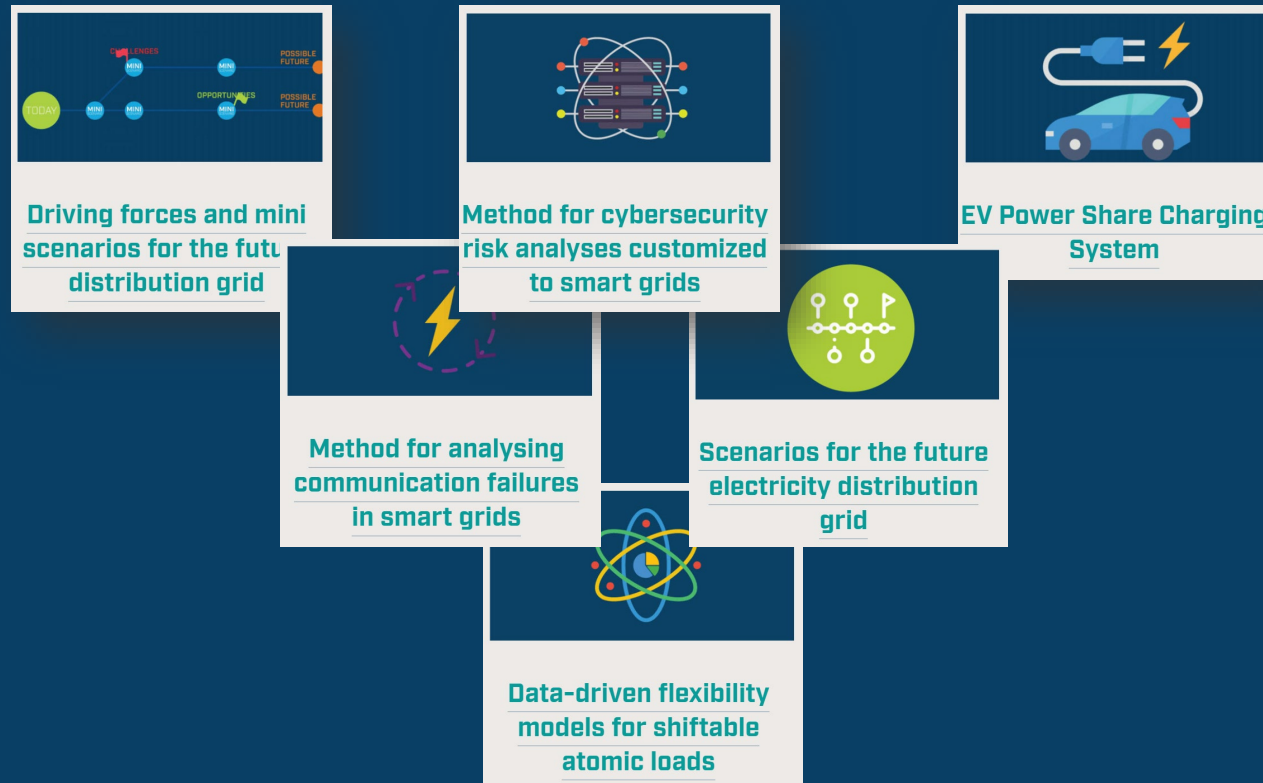
Smart grid scenarios and transition strategy





# Innovations

Through working with user partners, CINELDI identifies new business opportunities and elevate pilot projects to new national and international spin-off projects.



<https://www.sintef.no/projectweb/cineldi/innovation/>





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[www.cineldi.no](http://www.cineldi.no)



Centres for  
Environment-friendly  
Energy Research

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