ETN R&D Recommendation Report 2021

Project Board 2020-2022









NORCE Norwegian Research Centre



Project Board 2020-2022





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Energy and R&D

Energy Technology innovation (including R&D) is one of the pillars of the EU. The EU, including its member states, is the 3rd largest funder of public energy R&D (after the USA and China) and the investments keep increasing

Programme	% of the total budget dedicated to energy		
7 th FP	5% (EUR 2.4 billion)		
Horizon 2020	11% (EUR 8.3 billion)		
Horizon Europe	16% (EUR 15 billion)		

Evolution of global energy RD&D public spending by region or country



Source: IEA, European Union 2020 - Energy policy review, 2020



The role of the GT in the changing landscape towards climate neutral energy systems

- Sectorial implementation
- Sector coupling integration
- Technology enablers

Vision Document





Update of the R&D Recommendation Report

ETN R&D RECOMMENDATION REPORT OCTOBER 2018



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ETN RESEARCH AND DEVELOPMENT RECOMMENDATION REPORT 2018 |



ETN's High-Level User Meeting 2020 as input

"Operational optimisation and technology development needs for the transition to a carbon-neutral society"

Vision for the Energy Transition Decarbonisation **Energy Efficiency** Transition to new energy systems Improve the carbon footprint of new and Explore new and more Expand the solutions portfolio in the existing assets towards carbon-free generation efficient options transition to new energy systems Strategic Areas and Goals Affordable decarbonised gas turbine-Decarbonisation and security of supply Fleet improvements towards the most based solutions solutions through expanded fuel efficient and cost-effective solutions flexibility and system integration for the energy system **Current Assets Needs and Requirements** Decarbonisation System transition Carbon footprint measurements Advanced Cycles Large scale CC(U)S Large demonstration project Operation with decarbonised fuels

Energy Efficiency Improvements Existing assets upgrades and new assets Full and part load operation Increase overhaul service options Offshore OCGT to CCGT transition Light and compact bottoming cycles

Emissions NOx monitoring NOx emissions with alternative fuels (hydrogen, ammonia, biofuels) Flaring reduction

Reliability Maintain availability and performance

Competitiveness

CAPEX optimisation to support new investments Low OPEX models Affordable overhaul options Short term overfiring for peak power Economic viability of solutions

Hydrogen

Short-term retrofit to 20-30 vol.% 2030 target to 0-100 vol.% Local, small scale (<100MW), intermittent power Cooperation with TSOs and DSOs on infrastructure

Advanced Cycles sCO₂ Standard package solutions

GT Hybrid System

GT hybridization with batteries, decarbonized fuels, thermal storage

Key Enablers

Servicing Depot quality, diversity and capacity Healthy competition Lifecycle assessment

Workforce Develop and retain existing skills Attract new talents

Policy and Regulatory Market mechanism to reward transition System actors collaboration (TSO, DSO) Legislation Certification

Digitalisation Unmanned plants Data analysis Remote monitoring

Additive Manufacturing Product quality & Control



R&D Recommendation Report update

How:

- Review team with members of the Project Board
- Kick-off and general discussion
- Intermediate conference calls to synchronise the activities
- Input from user meetings and research programmes, strategies etc.

What was done:

- Review of the structure of the report
- Re-arranging chapters
- One additional chapter on system integration and energy storage

ETN R&D Recommendation Report Edition 2021								
GI@b	market conditions & policy framework operational flexibility efficiency (at part load)			on				
Sy	stems	integration	extended f	uel spectrum				
C	ecent Flex	ralised systen ibility (Fuel &	ns deca	emissions decarbonisation advanced cycles system integration and energy sto			& Gas	
	C	Digital solution	S	materials advanced repa	ir		Indus	trial
		Reliability		reliability, a digitalis	vailability, maintena ation	ance		
	sensors/instrumentation condition monitoring & lifing							
				ETN Global				

ETN key R&I topics of interest



ETN

Gl@bal



ETN's R&D commitment

Between 2009 and today ETN has participated, in various capacity, in **2 projects funded under EU's 7th FP** (H2-IGCC and OMSoP) and **4 projects funded under Horizon 2020**.

But, more will come soon!

CO2OLHEAT project Kick-off June 2021

Submitted project proposal on Heat & Power system solution

