



*Idrogeno e transizione ecologica
Gli attori, i luoghi e le opportunità*

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Claudia Vivalda, Director - National Energy Technology Cluster

- **CTN** (National Technology Cluster) – **Public/private partnership** operating on the national territory for **industrial research, training and technology transfer**, with the aim of coordinating and strengthening the link between the world of research and of industry through national and international initiatives. Co-funded by the Italian Ministry of University and Research
- **12 CTN** were created as a result of two calls for proposals:
 - **2012** – Aerospace, Agrifood, Green Chemistry, Intelligent factories, Transports, Life sciences, Technologies for living environments, Smart Communities
 - **2016** – Made in Italy, Economy of the sea, Cultural heritage, **Energy**
- The **National Energy Technology Cluster** started its activities in 2019

- **Task:** combine the **demand for innovation** in the **industrial** sector with the scientific and technical outcome provided by the **research structures** of the country to support the **energy transition** and therefore the achievement of the targets set by the *European Union* and the *SET Plan*, and at national level by the *PNIEC*, through research funding: *Horizon Europe, PNRR, PNR, RDSE, Mission Innovation, National and Regional Calls*
- **Founders:** **PRO** (ENEA, CNR, RSE), **Industry** (e-distribuzione, ENI, BAKER-HUGHES NUOVO PIGNONE TECNOLOGIE, TERNA), **Academy** (EnSiEL)
- **Associates (78):** 16 **territorial bodies** (some of which - territorial district/cluster - represents numerous SME), 12 **large industries**, 50 **Universities and PRO**
- **Reference** for institutional bodies as well as for regional and national administrations

- The Cluster implement a **Three-year Action Plan** approved by the Italian Ministry of University and Research that is annually updated
- Input to the update of the Action Plan come from:
 - ✓ National, European and international energy **policies and strategies**: **PNIEC** (Integrated National Plan for Energy and Climate), **EU Green Deal, Fit for 55 Package, RePowerEU Plan, SET Plan** (Strategic Energy Technology) and **R&I programs** such as **PNR** (National Program for Research), **PNRR** (National Plan for Recovery and Resilience, using Next Generation EU funds), **Horizon Europe, Mission Innovation, IPCEI** (Important Projects of Common European Interest), etc.
- Core of the Action Plan is its **Energy Technology Roadmap**

Six Priority Technological Areas -> Technology roadmaps (3-5)

- **Smart networks and micro-networks:** technologies, systems and methods for management and control
- **Energy storage:** technologies and management and control systems
- **Smart Grid:** innovative devices, technologies and measurement methodologies
- **Energy efficiency and renewable energy sources**
- **Smart Energy**
- **Hydrogen and CCUS Value Chain**

Technology roadmaps (3-5 in each Area, for a total of about 25)

- ✓ Sustainable mobility, power-to-gas, integrated energy networks, digitalization and smart metering, energy storage management, energy production and end-use efficiency, energy production from renewable sources (solar, wind), RES integration in buildings and environment, local energy communities, biochemicals and biofuels, industrial symbiosis in the energy sector (energy recovery from thermal waste), hydrogen, CCUS (blue hydrogen), energy network integration, local energy communities

Five main trajectories regarding the Hydrogen and CCUS value chains:

- **Technologies and processes for clean hydrogen production:** *electrolysis, reforming (+ CCU)*
- **Utilization:** *mobility (land, waterborn & airborne vehicles, refuelling), industry (chemical processes refinery, steels, others, heat and high temperature processes), residential*
- **Logistics:** *transportation & distribution (compression & liquefaction, piping & instrumentation), storage (above ground), transformation (methanation & fuel synthesis, purification & separation)*
- **R&D and validation** (valleys, ecosystems, residential, waste processing)
- **Technologies and processes for Carbon Capture, Utilisation and Storage (CCUS)**

Main activities:

- contribute to **innovation and technology transfer** by promoting **events** and facilitating **networking** and **matching**
- provide **support to the Associates** involved in research and innovation activities, with **specific insights** into all issues relating to the **energy sector**
- **coordinate** actions with other **Associations, industries, research centers**
- participate in institutional activities: **public consultation, auditions, thematic working groups and tables, ...**



Claudia Vivalda
Cluster Tecnologico Nazionale Energia
www.cluster-energia.it