



# INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

## IPHE Country Update November 2021: Italy

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### 1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

In the last year the Italian Ministry for Economic Development has issued the preliminary Guidelines for a National Hydrogen Strategy (November 2020)<sup>1</sup>. A new Ministry has been founded (for Ecological Transition) that has taken over responsibility over policies related to the energy transition, including the roll-out of hydrogen.

EU Recovery Fund (total for Italy €220B): €3.4B towards hydrogen roll-out, of which €160M for R&D, as set out in the national plan for recovery and resilience.

Regional funds (Smart Specialisation Strategies and Just Transition Fund) provide further opportunities for hydrogen implementation. Italy participates in the development of IPCEI on Hydrogen with €1.5B.

### 2. Hydrogen and Fuel Cell R&D Update

The main national R&D activities on hydrogen are currently supported under the Fund for Research on the electrical system financed – through the Ministry of Economic Development – by a component of the electricity tariff. Other ad hoc projects are funded through the Ministry of Education, University and Research.

Most hydrogen projects are funded through the European framework programmes for research (Horizon 2020, Horizon Europe). In 2021, another 10 funded projects kicked off with Italian participation, attracting €7M funds to Italy while mobilising over €37M funds in total. The implementation of the first Mission Innovation projects for the Hydrogen Challenge kicked off in 2021 for a total value of €17.5M.

### 3. Demonstration, Deployments, and Workforce Developments Update

The most important initiatives in terms of demonstrations and first industrial deployment projects have been two Important Projects of Common European Interest (IPCEI). These are industry-only undertakings that integrate individual deployment projects and programmes within a pan-European framework with multiple spill-over effect, to release State aid support.

To this effect, 2 integrated projects (one on enabling hydrogen technologies, the other on decarbonising hard-to-abate industrial sectors) were notified to the European Commission for authorization on Aug 31<sup>st</sup> 2021. Scheduled start of the projects Q1 2022.

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[https://www.mise.gov.it/images/stories/documenti/Strategia\\_Nazionale\\_Idrogeno\\_Linee\\_guida\\_preliminari\\_nov20.pdf](https://www.mise.gov.it/images/stories/documenti/Strategia_Nazionale_Idrogeno_Linee_guida_preliminari_nov20.pdf)



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

In addition, the flagship project Hydrogen Demo Valley – for the creation of an at-scale, fully integrated hydrogen ecosystem within the precinct of a Research Centre but with full access to industry for showcasing hydrogen products across the value chain – was kicked off, funded through the first Mission Innovation Hydrogen Challenge.

Many others projects have been announced, most of them are in the development and authorization phase and some of them already elected for funding under different programs. Below a selection of the most mature, to which at least as many could be added under advanced negotiation.

- H2iseo for the conversion of diesel trains in Valcamonica, named in the PNRR and selected by the Innovation Fund for funding.
- Project AGNES, port of Ravenna for the production of hydrogen on shore (100MW) and off shore (5MW)
- The Hydrogen Valley in Puglia, proposes the construction of three green hydrogen production plants in Brindisi, Taranto, and Cerignola for a total capacity of 220 MW, powered by photovoltaic production for a total power of 380 MW.
- Innovation Hub for Hydrogen in Carlentini, Sicily

#### 4. Events and Solicitations

In 2021 the first hydrogen fair in Italy has been Launched: Hydrogen Energy Summit Expo. In the Key energy Fair, famous at international level, for the first time the hydrogen area has been developed. The main international event to be held is the 8<sup>th</sup> edition of the European Fuel Cells and Hydrogen Conference (15-17 December 2021, on line). In addition, at least 3-5 events per month are being organized by various industries, associations, projects on hydrogen.

The Hydrogen Demo Valley project mentioned in the previous section is the main project that aims to reach out to international players, including IPHE members, but especially through the Mission Innovation platform on hydrogen valleys [www.h2v.eu](http://www.h2v.eu) . This project will also publish calls for tender and solicitations for component and service supply.

#### 5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

The main funding allocation to hydrogen is through the Recovery fund and the IPCEI projects, over €3B.

#### 6. Regulations, Codes & Standards, and Safety Update

The national association of industries (Confindustria) is carrying out a nation-wide gap analysis of regulation codes and standards for the deployment of hydrogen solutions in industry and infrastructure.

CIG, the national Gas authority, is working with stakeholders and government to study the normative framework for hydrogen injection in the gas grid. The national fire brigade is dealing with the regulatory framework related to hydrogen refuelling stations.



## Summary Country Update 2021: ITALY

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles <sup>2</sup>	25k by 2025	As of June 2020	Partnership between Toyota and ENI for FC cars and HRSs.	
FC Bus	1000 by 2025	As of June 2020	The main activity is through FCH 2 JU in Bolzano, Sanremo and Milano (CHIC, JIVE, Hy.Vlo.city, MERLIN). Sustainable Mobility Plan funds regions to develop public transportation (battery or hydrogen)	<ul style="list-style-type: none"> <li>• FCH JU projects, LIFE and CEF</li> <li>• Regional support</li> <li>• National fund for new bus fleet for PA</li> </ul>
Fuel Cell Trucks <sup>3</sup>	NA	NA	In Bolzano (REVIVE project) there is a garbage collection truck being deployed. In Bolzano the first refueling of a hydrogen truck ever made in Italy. 40 HRS foreseen by NRP.	
Forklifts	NA	NA	Toyota Material Handling in their factory near Ferrara have installed an onsite HRS to refuel a small fleet of forklifts	
Train	NA	NA	Lombardy, Puglia, Sicily, Abruzzo, Calabria and Umbria. These are the regions identified by the NRP that should guide the Italian experimentation of hydrogen for rail transport. FNM has already ordered 14 hydrogen trains to Alstom for H2iseo project	<ul style="list-style-type: none"> <li>• PNRR, Innovation fund, Budget Law</li> </ul>

<sup>2</sup> Includes Fuel Cell Electric Vehicles with Range Extenders

<sup>3</sup> As above



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

H <sub>2</sub> Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
70 MPa Delivered	346 by 2030	1	ENI announces an HRS in Milano (San Donato Milanese) and one near Venice in partnership with Toyota for vehicles. South Tyrol with the LifeAlps project promoted by the European Commission announces the opening of 5 new hydrogen refuelling stations by 2028.	
35 MPa Delivered	96 by 2030	3	European projects	<ul style="list-style-type: none"> <li>• FCH JU projects, LIFE and CEF</li> <li>• Regional support</li> <li>• National fund for new bus fleet for PA</li> </ul>
Stationary	Target Number <sup>4</sup>	Current Status	Partnerships, Strategic Approach	Support Mechanism
Small <sup>5</sup>	No specific target	As of 2019 around 20 units installed	New production facility for SOFC for Solid Power (Pergine-Trentino)	<ul style="list-style-type: none"> <li>• There are white certificates for micro-CHP that reward efficiency increase</li> <li>• An ecobonus for micro cogenerators, considering fiscal deduction, has been placed for 2018-2019-2020</li> </ul>

<sup>4</sup> Targets can be units installed and/or total installed capacity in the size range indicated

<sup>5</sup> <5 kW (e.g., Residential Use)



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

Medium <sup>6</sup>	No specific target	1 demonstration site		FCH JU
Large <sup>7</sup>	No target	None	Development of 100% hydrogen turbine (BHGE & Ansaldo Energia)	
District Grid <sup>8</sup>	No target	None		
Regional Grid <sup>9</sup>	No target	None		
Telecom backup	No target	Around 20		
<b>H<sub>2</sub> Production</b>	<b>Target<sup>10</sup></b>	<b>Current Status</b>	<b>Partnerships, Strategic Approach</b>	<b>Support Mechanism</b>
Fossil Fuels <sup>11</sup>	No target	None		
Water Electrolysis <sup>12</sup> (PEM, Alkaline, SOEC)	No target	None	New production facility in Pisa for Enapter (AEM electrolyzers)	
By-product H <sub>2</sub>	No target	None		

<sup>6</sup> 5kW – 400 kW (e.g., Distributed Residential Use)

<sup>7</sup> 0.3MW – 10 MW (e.g., Industrial Use)

<sup>8</sup> 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

<sup>9</sup> 30MW plus (e.g., Grid Storage and Systems Management)

<sup>10</sup> Target can be by quantity (Nm<sup>3</sup>, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

<sup>11</sup> Hydrogen produced by reforming processes

<sup>12</sup> Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)



## INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

Energy Storage from Renewables	Target <sup>13</sup>	Current Status	Partnership, Strategic Approach	Support Mechanism
Power to Power <sup>14</sup> Capacity	No target	None		
Power to Gas <sup>15</sup> Capacity	No target	1 <sup>st</sup> plant for H2 injection (5% and 10%) in grid launched near Salerno (SNAM Gas TSO)	TSO-level initiatives starting to emerge Power-to-gas pilots by ENEA and SGI (Società Gasdotti Italia)	Still to be determined

<sup>13</sup> Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity

<sup>14</sup> Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

<sup>15</sup> Operator has the opportunity to provide the stored energy in the form of hydrogen back to the energy system through multiple channels (e.g., merchant product, enriched natural gas, synthetic methane for transportation, heating, electricity)