



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

### IPHE Country Update March 2019: Italy

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<b>Covered Period</b>	To March 2019

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

An important achievement in the last 4 years has been the establishment of a national hydrogen and fuel cells association, [H2IT](#), which gathers 13 industries and 10 associations/universities/research organizations.

A “spin-off” of H2IT was created especially to address hydrogen mobility in view of Italy's required Plan for Alternative Fuels Infrastructure, following EU Directive 2014/94/EU. MobilitaH2IT developed a [National Plan for Hydrogen Mobility](#), which the Ministry of Economic Development has integrated into the National Strategic Framework for alternative fuels, published in January 2016. The Plan suggests Italy deploy an **adequate number of refuelling stations** to allow the circulation of fuel cell powered vehicles on the territory **by December 31, 2025**. The Plan includes a series of scenarios related to the **number of cars and refuelling stations**, and relative quantities of hydrogen to produce, estimating costs, and incentives. The National Strategic Plan should be updated every 3 years (revision due in 2019), but, importantly, **an implementation plan is still required**.

Article 5 of Legislative Decree 257 ordered the update of the technical regulation of fire prevention issued in 2006 (technologically outdated, but still applicable at the time). Intensive work between the Ministry of the Interior, the Central Directorate for Prevention and Technical Safety of the Fire Department, and the Hydrogen Working Group of ‘Assogastecnici’ led to the publication on 5 November 2018 of the "*Technical regulation of fire prevention for the design, construction and operation of hydrogen refuelling stations for mobility*".

It can be accessed at: <https://www.gazzettaufficiale.it/eli/id/2018/11/05/18A07049/sq>

This technical regulation will facilitate

- allowing the delivery of hydrogen at a **pressure of 700 bar** as required by the technical characteristics of the cars currently on the market;
- allowing the use of the **engineering approach** for the assessment of the installations on a case by case basis, guaranteeing the safety of the work and of the refuelling activity of the station;
- aligning Italy to other European countries, allowing the application of internationally recognized technical standards;
- allowing to partially overcome the economic and social limits deriving from the regulations in force up till then.

The Italian Government presented in December 2018 to the European Commission the proposal of the National Energy and Climate Plan (NECP), according to the Governance of the Energy Union and Climate Action. The Plan sets out measures to ensure the creation of a secure, sustainable and competitive energy system in order to achieve sustainable growth, promote fundamental role of research and innovation in the cleantech sector and reach the 2030 environmental targets at European level. The targets for RES are very significant and



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assume to cover more than 55% of the demand in the electricity field, 33% of the demand in the thermal sector and more than 21% in the transport sector, for an overall target of 30% of the gross energy consumption.

The NECP recognizes the strategic role of hydrogen in reducing CO<sub>2</sub> emissions and improving the energy system flexibility. In the mobility sector, hydrogen is expected to contribute around 1% of the 2030 RES-Transport target, through direct use or the introduction of methane in the network also for transport use. Development of power-to-gas long-term storage systems, enabling the large-scale integration of the electricity produced from renewable energy (PV, wind) into the energy system is also expected in the next decade.

One of the five dimensions of the NECP proposal is represented by the research, innovation and competitiveness' pillar. The dimension includes and refers to the national participation to Mission Innovation, which is committed to double public funds for R&D for clean energy from €222M in 2013 to €444M in 2021. Italy has joined the MI IC8 on Hydrogen and took part actively to the Mission innovation "Hydrogen Valleys" workshop organized in Antwerp on March 2019 presenting its national "Hydrogen Valley" located in Bolzano, South Tyrol.

Italy has also joined the Hydrogen Initiative, launched by the European Commission in September 2018 in Linz, Austria, in order to maximise the great potentials of sustainable hydrogen technology for the decarbonisation of multiple sectors, the energy system and for the long-term energy security of the EU.

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

Hydrogen R&D activities are currently funded at national level under the Fund for Research on the electrical system financed by a component of the electricity tariff.

Significant research is being carried out in Italy, mainly through mobilising European funds from the FCH 2 JU (€98M funding per year from the FCH JU supporting over 140 projects and 100 beneficiaries in 13 years spanning the two framework programmes). National programmes are currently funding 5 projects worth €8.5M. In addition, there is a lot of internal R&D taking place in universities, ranging from innovative materials to new fuel cell architectures to monitoring and diagnostic algorithms and system integration.

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

Among the most notable demonstration projects are the following:

- 3 FC Buses and H<sub>2</sub> refuelling station deployed in Sanremo at the end of 2018
- Bolzano planning 15 FC Buses in addition to the current 5 ([JIVE](#) & MEHRLIN projects – FCH JU)
- ENI announces an HRS in Milano (San Donato Milanese)
- SNAM (Italian gas Transmission System Operator) initiates first hydrogen injection in the gas grid
- Power-to-gas pilots by ENEA and SGI (Società Gasdotti Italia)
- Ongoing demonstration of a 170 kW SOFC plant running on biogas from waste-water treatment near Turin

As of yet no explicit deployment actions have been decided, and initiatives are still exploratory and local-scale. The workforce in the order of 1000 is active in H<sub>2</sub>FC (industry and academia).



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### **4. Events and Solicitations**

The 7<sup>th</sup> edition of the European Fuel Cell “Piero Lunghi” Conference will be held (EFC19) 9-11 December 2019 in Naples. This is a biannual event gathering around 250-300 scientists and policy representatives from around the world to discuss the rapidly evolving hydrogen and fuel cell panorama. It is co-scheduled with the all-Italian day on the State-of-Play of H2FC in Italy.

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

The 5 National projects currently running on H2FC applications mobilise around €8.5M funding.

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

As mentioned previously, an important update took place this year regarding the technical regulation of fire prevention, previously dated 2006 and which effectively impeded deployment due to technologically outdated requirements.

Italy is contributing to standardization work going on within IEC TC105 (fuel cells) and ISO TC197 (hydrogen generation) and the European CEN/CENELC TC6 on hydrogen distribution.



### Summary Country Update March 2019: Italy

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles <sup>1</sup>	1000 by 2020, 25k by 2025	As of 2019, 15	<ul style="list-style-type: none"> <li>• Toyota is keen but waits for HRS to be deployed to offer FCEVs. No implementation plan is currently available to force progress</li> </ul>	<ul style="list-style-type: none"> <li>• Still to be determined</li> </ul>
FC Bus	100 by 2020, 1000 by 2025	As of 2019, 10	There is an Italian bus manufacturer that has a FCB on catalogue (Rampini), but main activity is through FCH 2 JU in Bolzano and the north of Italy	<ul style="list-style-type: none"> <li>• Still to be determined</li> </ul>
Fuel Cell Trucks <sup>2</sup>	NA	None	In Bolzano (REVIVE project) there is a garbage collection truck being deployed	Still to be determined
Forklifts	NA	Around 5	CESAB in their factory near Ferrara have installed an onsite HRS to refuel a small fleet of forklifts	<ul style="list-style-type: none"> <li>• No support policy</li> </ul>
H <sub>2</sub> Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
70 MPa On-Site Production	No target	As of 2019, none	No implementation plan is currently available to force progress	<ul style="list-style-type: none"> <li>• Still to be determined</li> </ul>
70 MPa Delivered	140 by 2025	As of 2019, none	Toyota is keen but waits for HRS to be deployed to offer FCEVs. No	<ul style="list-style-type: none"> <li>• Still to be determined</li> </ul>

<sup>1</sup> Includes Fuel Cell Electric Vehicles with Range Extenders

<sup>2</sup> As above



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			implementation plan is currently available to force progress	
35 MPa On-Site Production	No specific target	As of 2019, none		• Still to be determined
35 MPa Delivered	60 by 2025	As of 2019, 4		
Stationary	Target Number <sup>3</sup>	Current Status	Partnerships, Strategic Approach	Support Mechanism
Small <sup>4</sup>	No specific target	As of 2019 around 20 units installed		• There are white certificates for micro-CHP that reward efficiency increase
Medium <sup>5</sup>	No specific target	1 demonstration site		FCH JU
Large <sup>6</sup>	No target	None		
District Grid <sup>7</sup>	No target	None		
Regional Grid <sup>8</sup>	No target	None		
Telecom backup	No target	Around 20		

<sup>3</sup> Targets can be units installed and/or total installed capacity in the size range indicated

<sup>4</sup> <5 kW (e.g., Residential Use)

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

<sup>6</sup> 0.3MW – 10 MW (e.g., Industrial Use)

<sup>7</sup> 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

<sup>8</sup> 30MW plus (e.g., Grid Storage and Systems Management)



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H <sub>2</sub> Production	Target <sup>9</sup>	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fossil Fuels <sup>10</sup>	No target	None		
Water Electrolysis <sup>11</sup> (PEM, Alkaline, SOEC)	No target	None		
By-product H <sub>2</sub>	No target	None		
Energy Storage from Renewables	Target <sup>12</sup>	Current Status	Partnership, Strategic Approach	Support Mechanism
Power to Power <sup>13</sup> Capacity	No target	None		
Power to Gas <sup>14</sup> Capacity	No target	1 <sup>st</sup> plant for H <sub>2</sub> injection in grid launched near	TSO-level initiatives starting to emerge	Still to be determined

<sup>9</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>10</sup> Hydrogen produced by reforming processes

<sup>11</sup> Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)

<sup>12</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>13</sup> Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

<sup>14</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)



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		Salerno (SNAM Gas)		
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