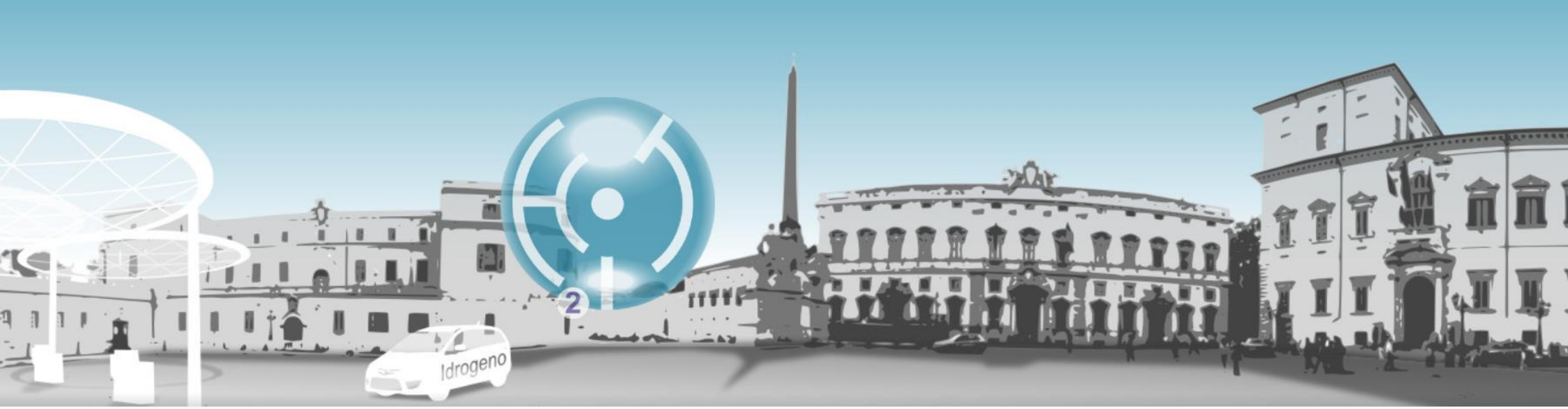

H2IT

Italian Hydrogen and fuel cell Association

STATE OF ART AND TRENDS OF INNOVATION IN ITALIAN H_2 SECTOR

SMARTENERGY WEBINAR

17 -2 - 2021

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P.le R. Morandi 2, Milano

WHO WE ARE

We are the voice of the Italian industry and research centers involved in the hydrogen sector. We aim to promote the development of the Italian market relating to the production, storage and utilization of hydrogen in Italy.

Enterprises

Hydrogen Europe

Network

Research centers and technology clusters

MISSION

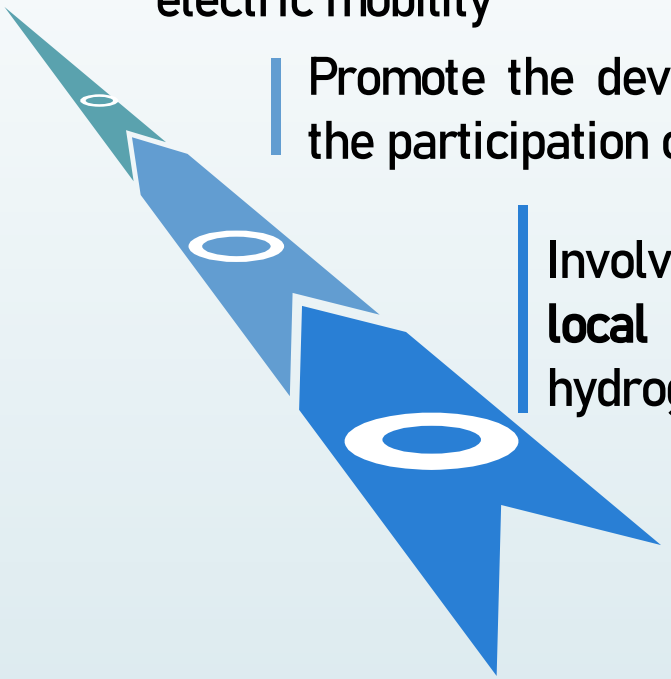
Promote technological progress and the development of the Italian market relating to the production, storage and use of hydrogen.

Specific objectives

Create the **political and normative conditions** for the development of stationary applications and hydrogen electric mobility

Promote the development of hydrogen through the participation of the **industry**.

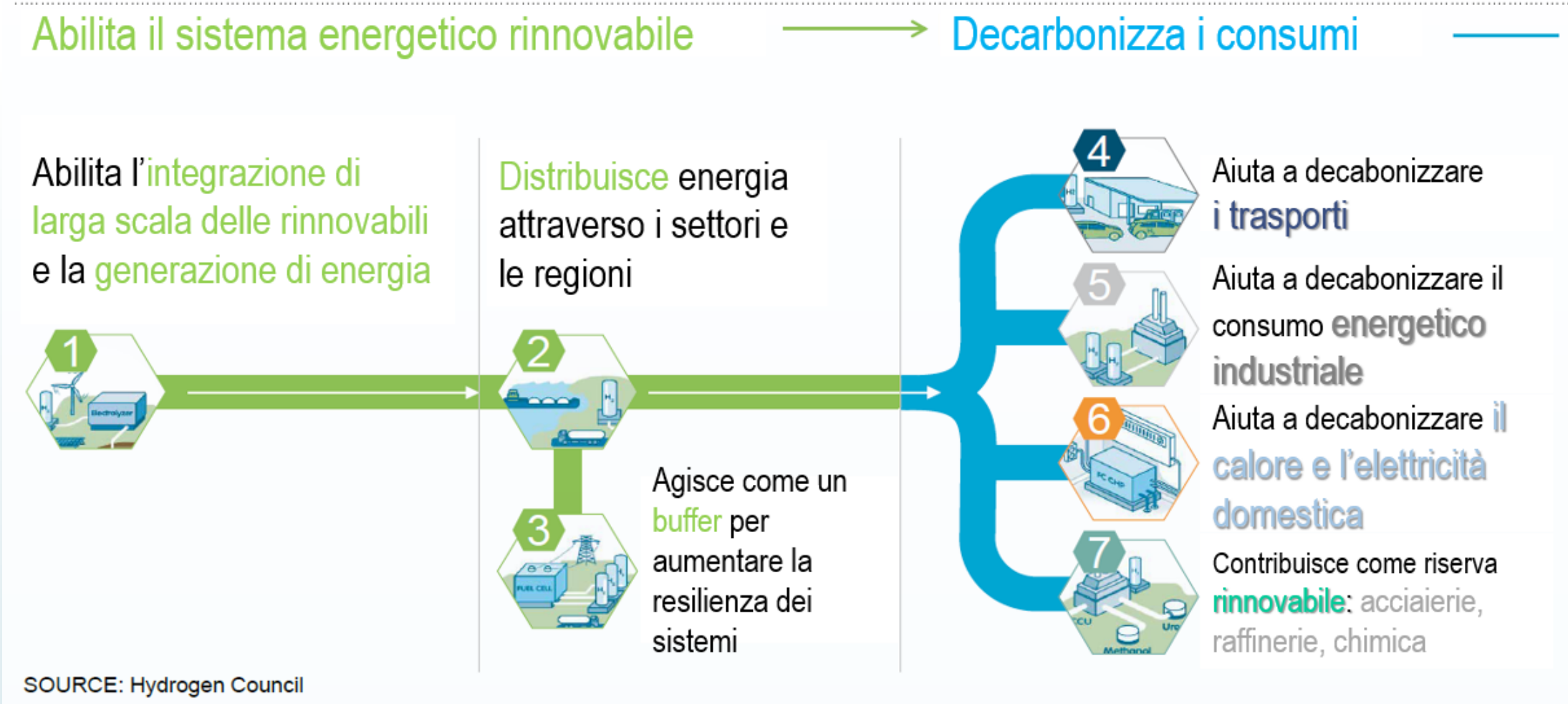
Involve the **Public Administration and local entities** to decide to invest in hydrogen final uses



- H2IT supports the government in drafting measures to support hydrogen development
- H2IT supports decision makers to create awareness on hydrogen as an option to contribute to the decarbonisation processes
- H2IT creates synergies between Industry and Research Bodies
- H2IT organizes conferences, workshops and events to increase public awareness and social acceptance of the role of hydrogen in the energy transition

HYDROGEN : ESSENTIAL TO DECARBONIE THE ENERGY SYSTEM

L'idrogeno è un **vettore energetico flessibile**, con potenziali applicazioni in tutti i settori dell'energia.



EUROPEAN AND INTERNATIONAL HYDROGEN INITIATIVES

2016

Davos meeting, the **HYDROGEN COUNCIL** is formed. Global initiative aimed at gathering industries and with a long-term vision for hydrogen to support the energy transition;

2018

The Innovation Challenge 8 on hydrogen is launched by Australia, part of the **MISSION INNOVATION** work program in which Italy also participates.

LINZ HYDROGEN INITIATIVE: Initiative proposed by the Austrian Presidency and signed by the European Ministers of Energy to support hydrogen;

New "**CLEAN HYDROGEN FOR EUROPE**" hydrogen program confirmed as a continuation of the FCH JU platform, support for R&I for hydrogen continues until 2030;

2019

Hydrogen is one of the Strategic Value Chains to be supported by **IPCEI - IMPORTANT PROJECTS OF COMMON EUROPEAN INTEREST**;

2020

Europe publishes the **HYDROGEN STRATEGY** e launches the **CLEAN HYDROGEN ALLIANCE**

STRATEGIC INITIATIVES IN ITALY

2016

With the legislative decree of **16 December 2016, n. 257** - Italy transposes Directive 2014/94 / EU on the development of an infrastructure for alternative fuels - AFID

2018

Italy participates in **MISSION INNOVATION**: IC8 - Renewable and Clean Hydrogen Innovation Challenge and signs the **LINZ HYDROGEN INITIATIVE**

Italy is involved in the **IPCEI** on hydrogen

"*Technical rules for fire prevention for the design, construction and operation of hydrogen distribution systems for automotive*" DECREE OF THE MINISTRY OF THE INTERIOR OF **OCTOBER 23, 2018**

2019

Hydrogen is included in the **National Energy and Climate Plan** in all the dimensions, in particular it is expected 1% of the RES target for transport. Ministry of Development (MISE) launches **HYDROGEN TABLE** for companies in the sector.

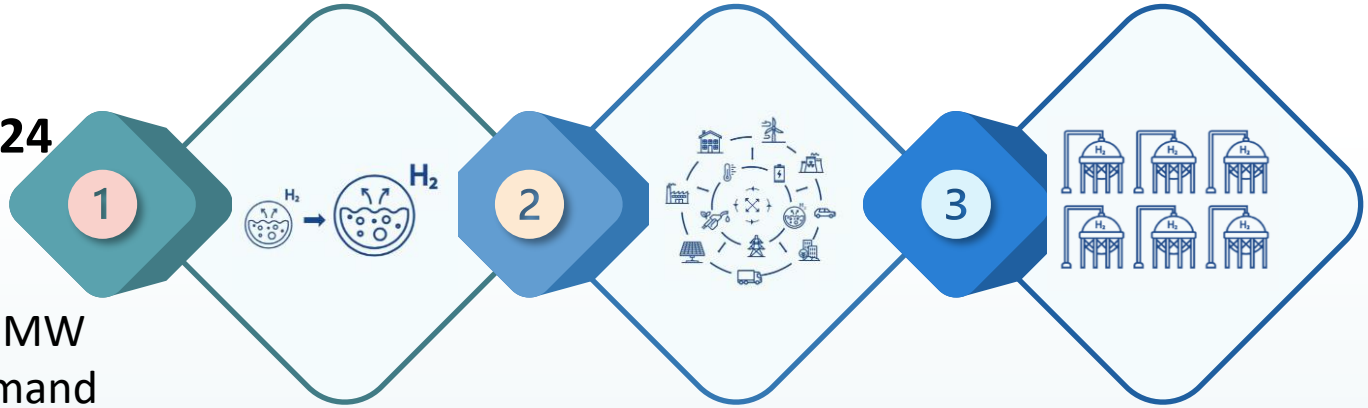
2020

Mise publishes preliminary guidelines for an **Italian hydrogen strategy** with investments of up to 10 billion, Hydrogen has been included in the **PNRR** 2 billion.

European Hydrogen Strategy

Today - 2024

- 6 GW electrolysers
- 1 Million t H2 green
- Electrolyzers up to 100 MW
- Production close to demand

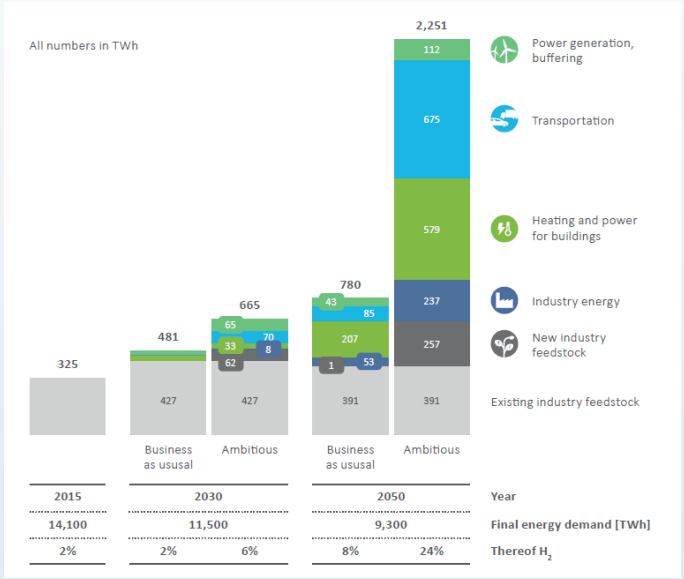


2025-2030

- Decarbonisation of the Industrial sector
- Development of H2 valleys
- 40 GW of electolysers and 10 million tons greenH2
- Development of the logistics infrastructure and refueling stations
- Open and competitive hydrogen market

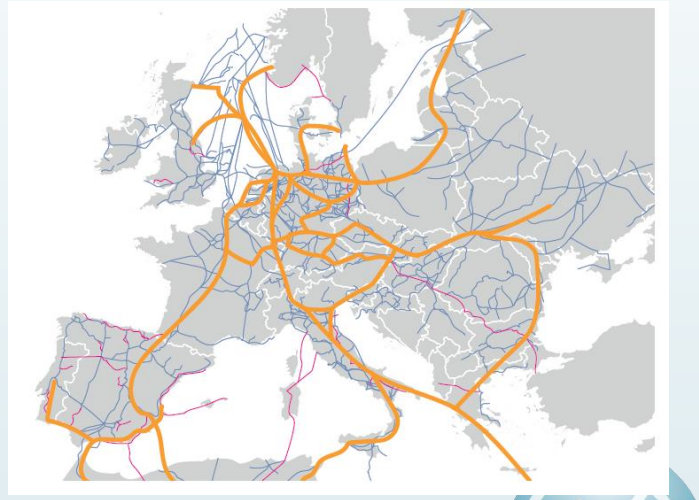
2030-2050

- Technological maturity and large-scale development
- ¼ of energy consumption represented by green hydrogen.



Already in 2030, the use of hydrogen will be more than doubled to 665 TWh, compared to 2015 use

Hydrogen gas infrastructure backbone to transport large amounts of H2 from the solar and wind RES areas throughout Europe including Ukraine



Italian National Hydrogen Strategy: Preliminary guidelines

OBJECTIVES

Italian National Hydrogen Strategy: Preliminary guidelines

PRIORITIES AND TARGET

A. Heavy duty Transport

- Responsible for 10-15% of emissions, O&M restrictions by 2030 and 2050, competitive TCO in 10 years, benefits for long hauls and short recharge times

2% FC Trucks in 2030

- 4000 Trucks
- Infrastructure investments, HRS strategically positioned, the A22 is named
- Take into account the AFID updates expected by 2021

B. Trains

- 1/3 Italian railways still running on diesel
- FC trains are already in operation in some European countries such as Germany

50% cannot be electrified

- Sardinia Sicily Piedmont,
- Synergies with heavy transport

C. Chemicals and refinary

- «Hard to abate» sectors, hydrogen feedstock already used 500,000 tons / year

1% of final uses

- Reconversion of areas Sector from which to start decarbonising
- northern Italy and islands where plants are concentrated

D. Miscelazione dell'idrogeno

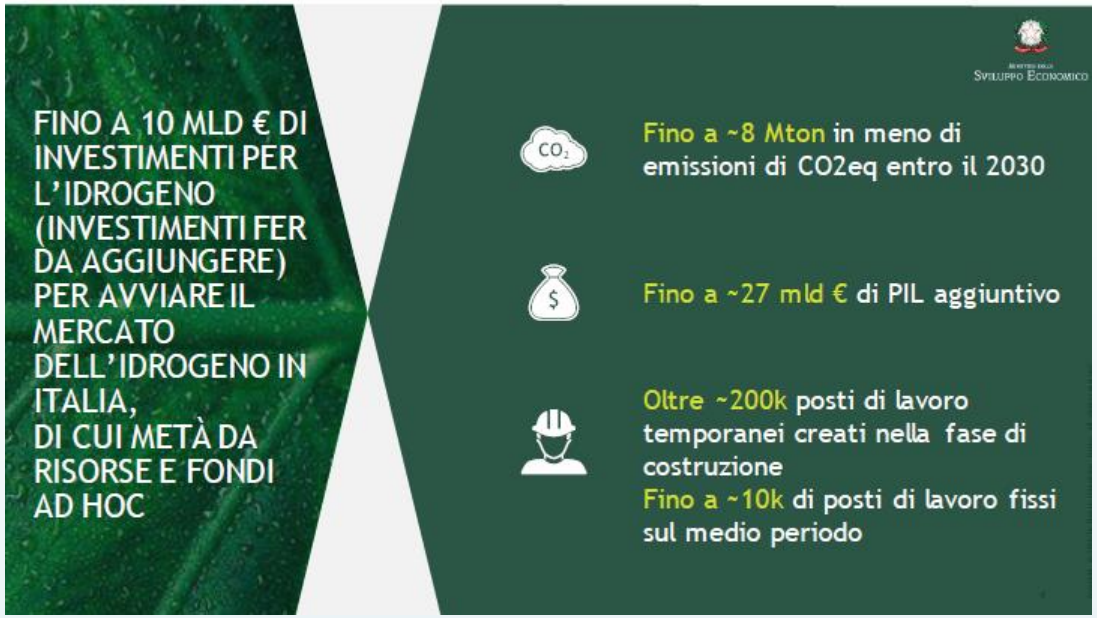
- 70 billion m3 of gas in the network
- Leverage overgeneration from RES

2% injection in the gas grid

Italian National Hydrogen Strategy: Preliminary guidelines

IMPACTS & INVESTMENTS

- 10 billion in investments over 10 years, of which
  - 5-7 for production
  - 2-3 for distribution (infrastructure)
  - 1 R&D
- Investments in gas infrastructure
- Up to half from ad hoc resources and funds
- 8 Mton CO2 saved by 2030 (4% PNIEC targets)
- + 27 billion GDP (projects lasting over 20 years) 200,000 jobs over the next 10 years



H2IT REPORT: Support Tools for the Hydrogen Sector | Phase 1

H2IT REPORT: Support Tools for the Hydrogen Sector | Phase 1

OBJECTIVE: Identification of legislative, regulatory or economic barriers along the entire value chain from Production to Final Uses, development of proposals and identification of action priorities.

- **COORDINATION:** H2IT in collaboration with research institutions and universities
- **WORK TABLES:** 7 tables divided by segment of the supply chain:
  1. **Production,**
  2. **Transport, distribution and treatment**
  3. **Storage**
  4. **Mobility**
  5. **Energy Uses**
  6. **Industrial Residential Uses and Feedstock**
  7. **Supply chain and cross themes**
- **APPROACH:** initially bottom-up by collecting information and experiences and then top-down by guiding the collection of specific feedback.

- **PARTICIPATION:** Operators in the sector throughout the value chain, research centers both partners and external companies so that all sectors of the supply chain were represented in a broad manner

48 INDUSTRY

12 RESEARCH

7 CLUSTER AND ASSOCIATIONS

RESULTS

51 PRIORITIES

66 POLICY

PRIORITIES

H2IT aims to reach political institutions and reference bodies in order to provide an in-depth study of complex issues such as the development of a potentially very broad industrial chain and a market linked to a new energy system, with an eye to deep decarbonisation .

1. Define the LONG-TERM STRATEGIC ROLE OF HYDROGEN in the Italian framework
2. CLEAR LEGISLATIVE AND TECHNICAL-REGULATORY FRAMEWORK
3. CERTIFICATION of renewable and low emission hydrogen
4. RESEARCH AND INNOVATION along the entire supply chain
5. Development of a REFUELING INFRASTRUCTURE FOR MOBILITY
6. Strategic collaboration between HYDROGEN VALLEYS projects
7. Promote SOCIAL ACCEPTABILITY of hydrogen technologies

PROJECT DEVELOPMENT PRIORITIES FOR ITALY

- Projects aiming at creating **ECOSYSTEMS WHERE HYDROGEN FINDS MORE USES (H2 valley)** where the risk of single application is limited;
- Enhance the development of **ELECTROLYSIS TECHNOLOGIES FOR P2G** and demonstration in the context of sector coupling between energy networks;
- Demonstration projects in the context of **HYDROGEN TRANSPORT IN GAS NETWORKS**, combined with storage solutions
- Enable the **PRODUCTION OF HYDROGEN WITH LOW CARBON CONTENT** with carbon capture systems, or renewable from biomethane
- Promote projects for the **USE OF HYDROGEN TO DECARBONIZE INDUSTRIAL PROCESSES**, (Refineries, Steel, Chemical.)
- Projects that demonstrate cases of **SPECIFIC APPLICATION TO END USERS OF MOBILITY:** car / bus, rail, maritime, heavy transport, material handling.

H2IT

Associazione Italiana Idrogeno e Celle a Combustibile