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Italy's National Hydrogen Strategy

A structured overview of objectives, constraints, solutions, and timing — for policymakers, energy planners, and industrial stakeholders.

↓ SCROLL TO EXPLORE

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Sustainable Blue Economy Partnership

Co-funded by the European Union

01 — OBJECTIVES

What Italy wants to achieve

Hydrogen is a cornerstone of Italy's decarbonisation pathway to 2050 — spanning industrial, geopolitical, and infrastructural dimensions.

Hard-to-abate sectors

Steel, cement, ceramics, chemicals, aviation, maritime — sectors where electrification alone is insufficient.

Energy system integration

Hydrogen as a storage vector for surplus renewables — enabling power-to-gas and long-term grid stability.

Industrial supply chain

Electrolysers, components, and clean-tech infrastructure — economic opportunity and competitive advantage.

Mediterranean energy hub

Pipelines from North Africa, upgraded ports, the Southern Hydrogen Corridor, and Italy's role in the European Hydrogen Backbone.

Certification system

Guarantees of origin to ensure hydrogen is genuinely low-carbon and prevent carbon leakage.

R&D and innovation

Advanced electrolysers, new materials, storage technologies, e-fuels, secondary solid fuels, and next-gen nuclear.

02 — TECHNICAL CONSTRAINTS

The limits that shape everything

The strategy is clear about the structural challenges. These critical points define where intervention is most urgent.

High production cost

Renewable electrolytic hydrogen suffers from low technological maturity and high CapEx (Capital Expenditures). Electricity and electrolyser costs remain prohibitive at scale.

No national H_2 network

No dedicated hydrogen grid exists today. Dedicated pipelines, port upgrades, and storage must all be developed from scratch.

Import logistics complexity

Liquefaction consumes ~⅓ of hydrogen's own energy content. Ammonia is more viable but requires costly reconversion infrastructure.

Regulatory bottlenecks

Permitting, certification, and guarantees of origin require significant simplification. Competitive procurement mechanisms are still being designed.

Competition from alternatives

Direct electrification, biomethane, bioenergy, secondary solid fuels, and nuclear all compete in overlapping sectors — making demand forecasts less predictable.

03 — POSSIBLE SOLUTIONS

What the strategy proposes

Solutions are organised across four macro-areas: production, import, infrastructure, and demand creation.

🌱 Production

- Renewable Fuels of Non-Biological Origin incentives to kick-start the market
- Hydrogen Valleys — localized production-consumption ecosystems
- Large-scale plants from 2030 onward
- Sector coupling: electricity, gas, H_2, storage

🚢 Import & Logistics

- Competition-based import mechanisms
- Southern Hydrogen Corridor — North Africa to Europe via Italy
- Ports upgraded for green ammonia, methanol, e-fuels
- Certification to distinguish green, blue, and low-carbon H_2

🛣️ Infrastructure

- Repurposing existing gas network for H_2
- New dedicated pipelines connecting hubs
- Salt cavern and tank long-term storage
- AFIR: 1 HRS every 200 km on TEN-T core network

🚛 Demand creation

- Structured demand support schemes
- Auctions, contracts for difference, H_2 PPAs
- Support the development of pilot projects aimed at scaling up
- Support and guide the change of industrial processes by supporting investment costs for the installation of equipment/assets in production processes

04 — TIMING

Three strategic horizons

Italy's hydrogen roadmap unfolds in three distinct phases — from early market creation to full-scale Net Zero deployment by 2050.

1

🟢 2024 – 2030 · Launch

PNRR projects, first Hydrogen Valleys, Renewable Fuels of Non-Biological Origin incentives, early HRS mobility network, certification frameworks, and industrial supply chain support. Goal: In this context, the national hydrogen strategy aims to implement measures to facilitate the implementation of such projects, working on incentive schemes to reduce the cost of hydrogen.

2

🟡 2030 – 2040 · Scale-Up

This phase will feature a set of measures designed to follow up on the initiatives driven by European obligations and the PNRR to launch a true hydrogen market, including through the development of large-scale solutions capable of reducing operating costs. The sector's potential growth in the medium term will be driven by emission reduction policies and fostered by the growing availability of hydrogen-ready technologies.

3

🔵 2040 – 2050 · Centralization

2050 will represent the end point of the Net Zero commitments, with hydrogen penetration potentially reaching approximately 18% of final consumption in the HTA industry and 30% of final consumption in the transport sector.

Italy's hydrogen future starts now

From strategy to infrastructure, from policy to industry — the transition requires coordinated action across all four pillars.

🎯 Objectives

Italy recognizes hydrogen as one of the key solutions for achieving decarbonization goals, in line with the commitments made in the National Integrated Energy and Climate Plan (PNIEC) for 2030 and Net Zero for 2050.

⚙️ Constraints

5 critical barriers: High Production Cost, No National H_2 Network, Import Logistics Complexity, Regulatory Bottlenecks, Competition from Alternatives.

🧩 Solutions

4 macro-areas: Production, Import & Logistics, Infrastructure, Demand Creation.

⏳ Timing

3 horizons to 2050: 2024-2030, 2030-2040, 2040-2050.

Share this carousel with colleagues in energy policy, infrastructure planning, and industrial decarbonisation. Tag someone who needs to see Italy's hydrogen roadmap. 👇