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H2MA

H2MA - Green Hydrogen Mobility for Alpine Region Transportation

Training package on green H2 mobility planning
Wien, 19.02.2024

Deliverable D.2.1.2

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Hydrogen Mobility Planning – Intro H2MA project

WHAT: H2MA project aims to coordinate and accelerate the transnational roll-out of green hydrogen infrastructure for transport and mobility in the Alpine region.

HOW: Through the joint development of cooperation mechanisms, strategies, tools, and resources.

WHO: 11 partners from all 5 Interreg Alpine Space EU countries (SI, IT, DE, FR, AT).

WHEN: from 11.2022 to 10.2025

WHY: to increase the capacities of territorial public authorities and stakeholders to overcome existing barriers and collaboratively plan and pilot test transalpine zero-emission H2 routes.

MAIN FOCUS: create **policy** and **strategies** in order to accelerate the deployment of H2 routes.

CONTENT OVERVIEW

1. Introduction
2. Territorial State of Play for Hydrogen mobility in the Alpine Region
3. Objectives and challenges of green hydrogen mobility in the Alpine Space
4. The importance of policy makers and public authorities
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5. Steps in Developing a National Hydrogen Strategy– some examples of hydrogen regulation across Europe
   5.1 Italian national hydrogen strategy
6. Operational guidelines to help public authorities update and/or develop hydrogen policies and relevant action plans

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INTRODUCTION

Hydrogen is an environmentally friendly alternative to fossil fuels and can be used to provide flexible and high-density power and propulsion for a wide range of modes of transportation. Although hydrogen can be produced in a variety of ways, e.g. from natural gas, nuclear power, or biomass, zero emission H2 is produced mainly through electrolysis of water, powered from renewables like solar and wind.

Government policies and regulations play a critical role in the design and implementation of a green hydrogen mobility network. This includes regulations on the production, storage, distribution, and use of hydrogen fuel, as well as incentives for the adoption of hydrogen vehicles.

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Territorial State of Play for Hydrogen mobility in the Alpine Region

Diversity: Each EUSALP country has its own national strategies and policy frameworks.

Common Focus: Shared emphasis on the transport sector in current hydrogen policy debates.

H2MA Project: Transnational Collaboration →

Emphasis: Establishing a collaborative mechanism.

Goal: Plan the rollout of hydrogen infrastructure for heavy-duty transportation.

Contributions: National and regional strategies, EU initiatives on green hydrogen mobility.

The collaborative effort within the H2MA partnership aims to overcome regional challenges and pave the way for a sustainable and green hydrogen-powered future in the Alpine region.

Importance of transnational governance and action plans highlighted for successful deployment.

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Objectives and challenges of green hydrogen mobility

Public authorities and policy makers recognize the urgent need for transformative change in the mobility sector. Hydrogen, with its potential to significantly reduce carbon emissions, plays a central role in achieving the European Green Deal's objective of climate neutrality by 2050.

The AFIR Proposal

The European Commission has put forth the Alternative Fuels Infrastructure Regulation (AFIR) to accelerate the production, use, and distribution of green hydrogen. Here are the key targets proposed by AFIR:

1.Hydrogen Refuelling Stations (HRS) Network:

1. Establish publicly accessible HRS every 150 km along the TEN-T core network by 2030.
2. Each station should have a minimum cumulative capacity of 1 ton/day and be equipped with a 700-bar dispenser.
3. At least one HRS in every urban node.
4. Liquid hydrogen availability within a maximum distance of 450 km between stations by 2030.

2.Promoting Deployment:

1. National policy frameworks must support HRS deployment.
2. Member States should submit clear trajectories toward meeting the 2030 targets.
3. An indicative target for 2027 to ensure sufficient coverage of the TEN-T core network.

Impact

AFIR is a milestone in our 'Fit for 55' policy, enabling citizens to charge electric cars as easily as refueling at traditional petrol stations. By embracing green hydrogen, we pave the way for a sustainable and climate-friendly future.

Objectives and challenges of green hydrogen mobility

MAIN CHALLEGES

Based on the review of national and regional strategies and considering the key findings from prior deliverables of H2MA project, several challenges within territorial hydrogen strategies and mobility plans have been identified:

1. Establishing clear and specific targets at national and regional levels;
2. Transalpine policy harmonisation through the adoption and integration of EU targets and benchmarks into national strategies and transalpine green hydrogen mobility;
3. Transalpine coordination in establishing a shared pipeline distribution network;
4. Establishing common safety standards and requirements in the design and operation of hrs;
5. Infrastructure deployment.

The importance of policy makers and public authorities

The Essence of Strategic Planning

Strategic planning is a vital process for governments to set long-term goals, create roadmaps, and align stakeholders. In the context of green hydrogen infrastructure, it provides direction, aligns stakeholders, and aids decision-making.

Key Points:

- **Process Overview:** Systematic and structured process for defining goals and objectives.
- **Importance for Hydrogen:** Establishes direction, aligns stakeholders, aids decision-making.
- **Benefits:** Better communication, collaboration, and resource allocation.

Example: Germany's national hydrogen strategy showcases effective strategic planning for green hydrogen.

Germany's national hydrogen strategy

- It is a virtuous example of strategic planning
- It showcases effective strategic planning for green hydrogen.
- It provides precise and achievable objectives
- Objectives are coupled with concrete action points

The importance of policy makers and public authorities

Germany's Updated National Hydrogen Strategy (2023) → Germany's Comprehensive Hydrogen Strategy unveiled in 2020 → 2023: Revision and Ambitious Targets and **f**ocused on domestic green hydrogen production

Policy Framework:
Renewable Energies Sources Act (EEG) 2021 (Amended in 2023)

National Hydrogen Strategy (NHS) 2020

Revised Targets (Until 2030):

Doubling Electrolyser Capacity: 10 GW for Green Hydrogen Production.

Hydrogen Start-up Grid: 1,800 km Infrastructure by 2027-2028 (Connected to European Hydrogen Backbone).

Expanded Applications: Industry, Heavy-Duty Vehicles, Air and Shipping Transport, H2-Ready Gas Power Plants.

Global Leadership: Germany positioned as a Lead Supplier for Hydrogen Technologies by 2030.

International Framework: Creation of European and Global Conditions (Efficient Permit Procedures, Joint Standards).

Action Areas (Short Term):

a) Ensure Sufficient Hydrogen Supply by 2030:

Total Demand: 95-130 TWh by 2030.

Exploration of Imports, Shipping, and Future Options (Green Methane, Synthetic Methanol, LOHC).

Action Areas (medium Term):

b) Establish Robust Hydrogen Infrastructure:

National Core Hydrogen Grid Proposals.

EU Level Focus (European Hydrogen Backbone).

Cross-Border Collaborations for Joint Production and Distribution Clusters.

Infrastructure Development for Imports from Third Countries.

Action Areas (Long Term):

c) Establish Hydrogen Applications:

•Support for Industry via Climate Contracts, IPCEI Projects, and Programs.

•Transformation Strategies in Transport, Electricity, and Heating Sectors.

Conclusion:
Germany's 2030 Hydrogen Strategy focuses on ambitious targets, infrastructure development, and comprehensive measures across key action areas to lead in hydrogen technologies and contribute to global sustainability goals.

The importance of policy makers and public authorities

Developing Strategies and Action Plans

Strategic planning for hydrogen involves two document types: strategies and action plans. These provide a conceptual framework and practical steps to achieve overarching objectives.

Key Points:

- **Document Types:** Strategies (conceptual roadmap) and Action Plans (practical steps).
- **Elements of Action Plans:** Specific tasks, time horizon, resource allocation.
- **Complex Process:** Involves initiation, research, goal setting, policy framework development, monitoring, and evaluation.

Example: Bavaria and Piemonte regions developing regional strategies for hydrogen showcase the diversity in strategic planning.

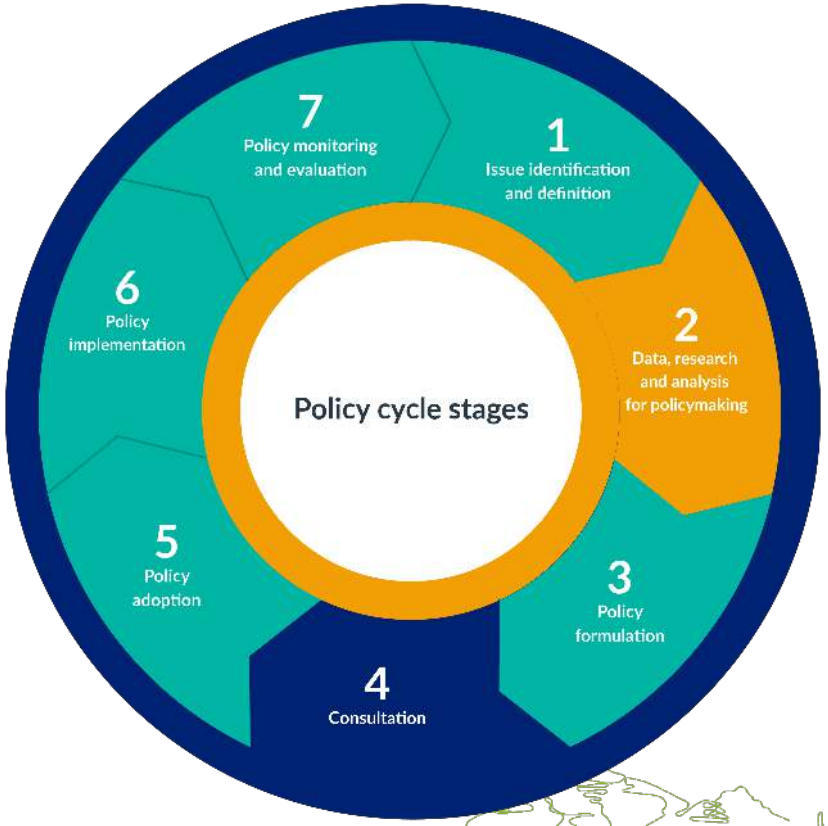
Steps in Developing a National Hydrogen Strategy

Stepwise Process

Key Components: Initiation, Research, Goal Setting, Policy Framework, Monitoring challenges and considerations

Key Phases:

I. Issue identification: Identifying the need, engaging stakeholders, setting priorities.
II. Data, research and analysis: Data collection on current hydrogen sector status and trends.
III. Goal Setting: Establishing SMART objectives for successful implementation.
IV. Policy formulation: Translating goals into concrete actions with timelines and resource allocation.
V. Consultation: engage stakeholders to align with them on major issues
VI. Policy adoption and implementation.
VII. Monitoring and Evaluation: Framework for assessing progress and adjusting.



Italian national hydrogen strategy

- It is a virtuous example of strategic planning
- It sets specific, measurable targets for hydrogen deployment.
- It is aligned with European targets

Italian Strategy on Green Hydrogen and Energy Transition:

- **CO2 Reduction and Decarbonization:** Italy aims to reduce CO2 emissions in line with EU and international targets
- **Hydrogen's Key Role in the Energy Ecosystem**: plans to increase its share in the energy mix to 13-14% by 2050, driven by a substantial growth in electrolysis capacity.
- **Transportation**: Priority is given to hydrogen use in long-haul trucks, trains, and heavy vehicles, targeting at least 2% penetration of fuel cell trucks by 2030.
- **Industry**: Hydrogen is identified as the sole zero-emission alternative in primary steel production (Direct Reduced Iron - DRI).
- **Hydrogen Valleys**: Promotion of hydrogen valleys as ecosystems integrating hydrogen production and consumption, acting as hubs for hydrogen diffusion by 2030.
- **Electrolysis Capacity and Infrastructure**: Plans include installing around 5 GW of electrolysis capacity by 2030, accompanied by a dedicated network of refuelling stations and infrastructure for hydrogen production, transport, and storage.
- **Financing and Policies**: investments up to ~€10 billion from 2020 to 2030 allocated for hydrogen production, distribution, consumption infrastructure, research, development, and the required renewable sources.
- **Economic Incentives and Environmental Impact**: Anticipated environmental impact includes a reduction of CO2eq emissions by ~8 Mton in 2030, contributing to 4% of the National Integrated Energy and Climate Plan (PNIEC) goals, with positive economic effects on GDP, job creation, and industry growth.
- **EU Support**: leverage EU financial instruments, such as Next Generation EU, Horizon Europe, Innovation Fund, and the National Operational Plan (PON) 2021-2027, to facilitate the low-carbon hydrogen transition.

Operational guidelines based on H2MA key findings

STEP 1

Identification of H2MA Key Takeaways: key findings from WP1 deliverables (A1.1, A1.2, A1.4, A1.5).

Activity A1.1 identified gaps in green mobility infrastructure in the Alpine space, revealing issues like uneven distribution of hydrogen refuelling stations (HRS) and lack of harmonization in policies.

Key findings include the lack of concrete quantifiable targets in most national strategies, uneven distribution of existing HRS, and the need for a transalpine cooperation mechanism.

Recommendations include setting quantitative targets for hydrogen mobility, improving strategic infrastructure planning, fostering transalpine collaboration, and developing harmonized policies and standards

Focus on Activity A1.2 - Planning specifications and requirements for setting up green H2 mobility routes.

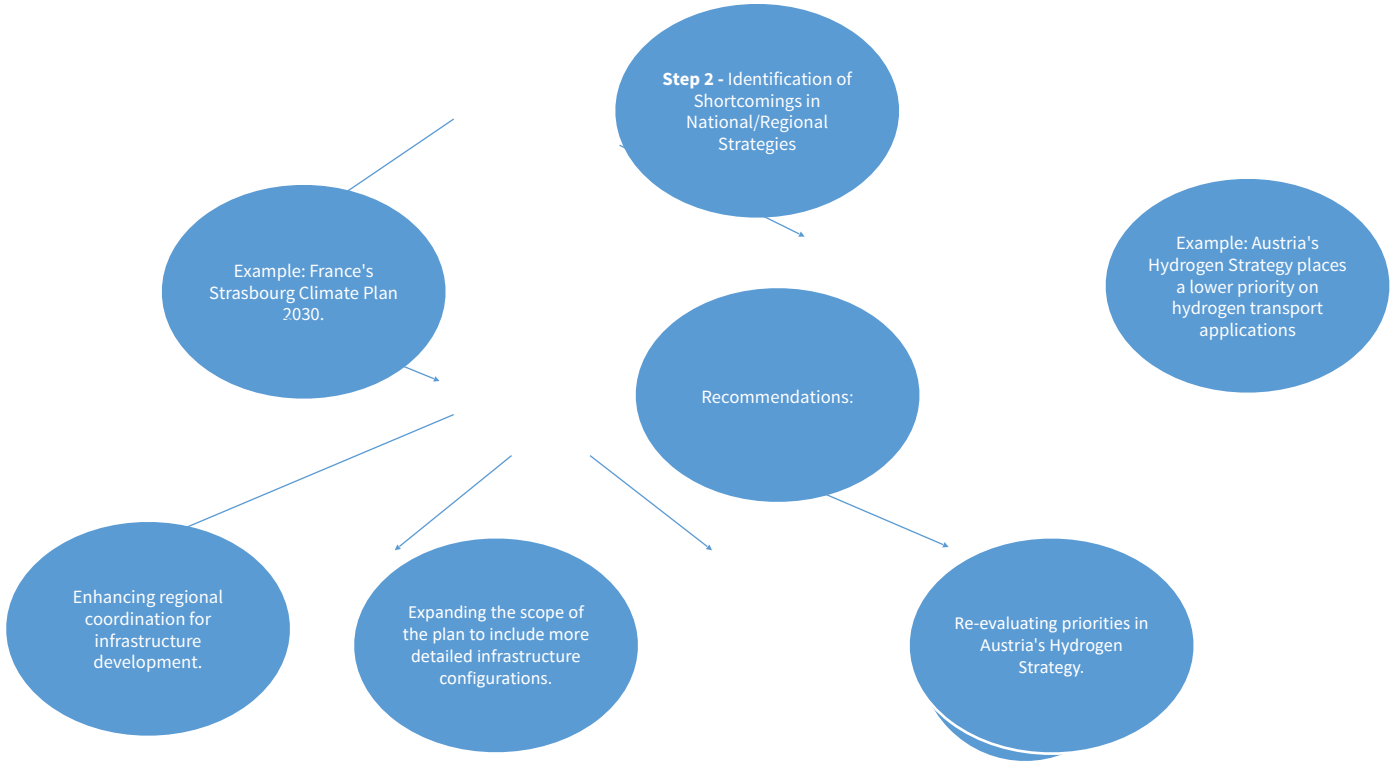
Study visits in Strasbourg and Augsburg provided insights into planning requirements for urban and commercial transportation.

Harmonizing safety standards for hydrogen infrastructure.

Incorporating knowledge from study visits into national strategies.

Enhancing coordination and harmonization in safety standards.

Operational guidelines based on H2MA key findings



Operational guidelines based on H2MA key findings

•Step 3 -General guidelines for drafting

•Use clear and concise language.
•Consider local context and conditions.
•Recognize varying development paces among territories.
•Address shortcomings identified in existing strategies.
•Example: Fostering a Permanent Transalpine Cooperation Mechanism for Hydrogen Mobility.

Policy Recommendations (Selected Examples)

•Examples of policy recommendations based on key findings and shortcomings:

1. Fostering a Permanent Transalpine Cooperation Mechanism.
2. Developing Harmonized Policies and Standards.
3. Setting Quantitative Targets for Hydrogen Mobility.
4. Improving Strategic Infrastructure Planning.

•Each recommendation aligns with the broader energy and environmental goals of the respective territories and emphasizes collaboration for economies of scale in hydrogen development.

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Thank You for your attention!

Any questions?

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