**HYDROGEN AND THE PATH TOWARDS THE NET-ZERO COMMITMENT**

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**Paris Agreement:**
- 194 countries + EU
- Reduce GHG emissions to hold the increase in global T below 2 °C
- Review the parts’ commitments every 5 years

**H2 Momentum:**
- Revision of NDCs
- H2 plays a key role in NDCs
- The H2 Roadmap has been announced by many countries(40-50).

**The First Global Stocktake:**
- 38 countries signed H2 scheme certification declaration of intent – H2TCP leader with Task 47
- 2030, triple global renewable energy capacity
- Fossil Fuel Phaseout

**Toward Net-Zero:**
To keep temperature, increase below or equal to 1.5 degrees, countries must cut emissions by at least 45 per cent compared to 2010 levels.

**Neutral in Emitting CO2:**
The transition to net-zero emissions must be fully complete

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**COP 21**
Energy Sector 18% GHG

**COP 26**
2020 - 2021

**COP 28**
2023

**Race to Zero**
2030

**Net-Zero Emissions 0%**
2050

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THE GLOBAL HYDROGEN LANDSCAPE

**DEMAND**

Hydrogen demand remains concentrated in traditional uses (refining and chemical industry).

**PRODUCTION**

Most is based on unabated fossil fuels. Low-emission production is yet to take off as a mainstream industry.

**TRANSPORT AND STORAGE**

Transport and storage are critical elements of the low-emission H2 supply chain.

Global H₂ use reached 95Mt in 2022, a nearly 3% increase from 2021.

**INTERNATIONAL TRADE**

International trade in H₂ is today at a very nascent stage.

**ROADMAPS**

41 Countries have H₂ Roadmaps and strategies to achieve Net-Zero goal.

**POLICY**

Policy trends show an increase in the number of policies and strategies being announced to support scale-up of low-emission hydrogen.
THE GLOBAL HYDROGEN LANDSCAPE - GOVERNMENTS

- **2020**
  - European Green Deal

- **2021**
  - European Climate Law
  - China's National Hydrogen Development Plan

- **2023**
  - UAE National Hydrogen Strategy 2050
  - Brazil: Programa Nacional do Hidrogênio
  - Algeria National Hydrogen Strategy
  - U.S. National Clean Hydrogen Strategy and Roadmap
H2TCP IN A NUTSHELL

Members
25 Member Countries
+ European Commission
8 Sponsors

Tasks
10 Open
40 Finished
3 Preliminary Proposals

Experts involved
In collaborative research on hydrogen technologies

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Leadership
IEA Collaboration: Lead the H2 Coordination Group and with other TCPs

Development
Introduce the TCP to key regions for H2 development. e.g. LATAM and Africa

Collaboration
Foster international collaboration on R&D&D for H2 technologies

Innovation
Task Portfolio with innovation topics

Challenges
Addresses critical issues and main challenges in the H2 value chain

Synergies
Create synergies among stakeholders and avoid duplication of efforts

HYDROGEN TCP
CONTRIBUTION
HIGHLIGHTS OF OUR LAST TERM

2020-2025

19 R, D&D Studies and publications

7 Task annual reports

17 Executive Committee Meetings

+100 Events, meetings and workshops in Europe, Asia, Oceania, Africa, America, and online.

7 New Members:
4 Contracting Parties: Portugal, USA, Ireland and Morocco. 3 Sponsors: NTPC, ADNOC, Eni
HYDROGEN TCP 2025 – 2030

VISION

A world where clean and affordable hydrogen plays an essential cross-sectoral role in a secure and sustainable energy future.

MISSION

To accelerate the development and deployment of sustainable technologies for the production, storage, and delivery of clean and affordable hydrogen and its derivatives for use in industry, mobility, heating, and power.

STRATEGY

To align and facilitate innovative research, development, and demonstration activities as a hub for international cooperation and sharing knowledge.
OVERARCHING OBJECTIVES AND STRATEGIC ACTIVITIES (TBD) 2025 - 2030

Technical Leadership
To continue to provide technical leadership in the international hydrogen community by:

- **Hydrogen R&D Facilitation**
  Acting as the primary facilitator for organisations seeking to undertake hydrogen R&D projects by offering comprehensive support.

- **Value Chain Research**
  Researching relevant current and emerging topics within the complete hydrogen value chain.

- **Clean Hydrogen Exploration**
  Exploring various dimensions of clean hydrogen production, transportation, storage, market penetration, infrastructure development, technological advances and regulatory frameworks.

- **Awareness**
  Identifying emerging needs and communicate potential breakthroughs.

- **Policy Guidance**
  Providing technical guidance to policymakers and industries to streamline the implementation of hydrogen projects.

- **Societal Impact Analysis**
  Exploring the societal implications of hydrogen implementation.

- **Engagement with Platforms**
  Engaging with platforms specialising in techno-economic and life cycle assessments, sustainability, regulations, and business guidelines.

- **Community Expansion**
  Maintaining and expanding the H2TCP’s community of experts.
Internal Operations
Taking into account its new objectives, the Hydrogen TCP aims to optimise internal processes and procedures in order to ensure the efficient functioning and effective coordination of the H2TCP. It aims to do this by:

▪ Enhancing administrative workflow.
▪ Implementing robust organisational structures.
▪ Establishing clear guidelines, standardising methodologies, and creating comprehensive manuals.

Collaboration
Enhance collaboration to establish the H2TCP as a leading participant in global efforts to advance hydrogen technologies and address energy transition challenges by:

▪ Leading the Hydrogen Coordination Group.
▪ Promoting internal collaborations within the IEA network across all TCPs.
▪ Expanding external collaboration beyond the IEA network.
▪ Expanding global membership to achieve diverse representation, including members from countries aiming to advance their objectives in the hydrogen sector.

Communication and Outreach
Strengthen communication channels and outreach initiatives to effectively distribute information, foster engagement by:

▪ Communicating IEA hydrogen knowledge and results.
▪ Sharing hydrogen information from government, industries and academies to policy makers, decision-makers and the greater public.
▪ Consolidating effective internal and external communication channels (social media, newsletters, website, etc).
CORE ACTIVITIES

- Collaboration
- Task Portfolio
- Strategic Activities
CORE ACTIVITIES

Collaboration

External

Internal

THE HYDROGEN COORDINATION GROUP

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## Mapping the Landscape for International Collaboration on H2

<table>
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<tr>
<th>Initiative</th>
<th>Long-term vision &amp; action plans</th>
<th>Demand creation &amp; management</th>
<th>Infrastructure &amp; supply chains</th>
<th>Finance &amp; investment</th>
<th>Research &amp; innovation</th>
<th>Market Structures</th>
<th>Standards &amp; certification</th>
<th>Trade conditions</th>
<th>Knowledge, Capability &amp; Skills</th>
<th>Social engagement &amp; impact</th>
<th>Landscape co-ordination</th>
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## Priority Actions for the H2 Breakthrough in 2024

<table>
<thead>
<tr>
<th>Priority International Action</th>
<th>2024 Objectives</th>
<th>Initiatives</th>
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<tbody>
<tr>
<td><strong>H1: Standards &amp; Certification</strong></td>
<td>Accelerate and fully resource a coordinated programme to develop a comprehensive portfolio of international hydrogen standards and facilitate associated certification schemes.</td>
<td>Coordinating: IPHE Partners: IEA’s Hydrogen TCP, IRENA, UNIDO</td>
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<td><strong>H2. Demand Creation &amp; Management</strong></td>
<td>Coordinate the agreement of packages of firm and sustained public and private commitments for the large-scale use renewable and low carbon hydrogen that displaces fossil fuel use and supports just transitions.</td>
<td>Coordinating: RMI, CEM H2I Partners: FMC, WEF’s Accelerating Clean Hydrogen Initiative, IHTF, MI Clean H2 Mission, H2 Global</td>
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<td><strong>H3. Research &amp; Innovation</strong></td>
<td>Drive a significant increase in the number and geographical distribution of new, innovative hydrogen research and demonstration projects across a diversity of hydrogen’s high-value end use sectors, backed by mechanisms to broaden and more rapidly share learnings from projects.</td>
<td>Coordinating: Mission Innovation Clean Hydrogen Mission Partners: IEA H2 TCP</td>
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<td><strong>H4: Finance &amp; Investment</strong></td>
<td>Enhance the international assistance offer for clean hydrogen, coordinating and facilitating access to increased finance and support, enabling private investment at scale in EMDEs. Targeted support for ‘lighthouse projects’ in EMDEs through a coordinated transition platform.</td>
<td>Coordinating: World Bank &amp; UNIDO Partners:</td>
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<td><strong>H5: Landscape Coordination</strong></td>
<td>A widely supported, structured, open, resource-efficient approach to the voluntary and consensus-based coordination of international hydrogen initiatives.</td>
<td>Coordinating: Breakthrough Agenda project team Supported by Hydrogen Breakthrough Facilitator, hosted by IPHE Secretariat Partners: All willing H2 initiatives.</td>
</tr>
</tbody>
</table>
Priority Action delivery plan
H3. Research & innovation

**Priority Action**
Drive a significant increase in the number and geographical distribution of new, innovative hydrogen research and demonstration projects across a diversity of hydrogen’s high-value end use sectors, backed by mechanisms to broaden and more rapidly share learnings from projects. Progress to be reported on by COP29.

**How this will be taken forward**
By joining and/or increasing support for and engagement with the Mission Innovation Clean Hydrogen Mission’s goals and the work of IEA’s Hydrogen and Fuel Cells TCPs to deliver a wider portfolio of Hydrogen Valleys, supported by expanded R&D programmes and strengthened sharing of learning from those projects.

**Key steps and milestones in 2024**
- Continuation working groups to identify R&I needs and best practices on ‘hydrogen production’, ‘distribution and storage’, ‘End-use off road applications’ (Q1-Q4). Potential new group on ‘End-use steel’ (Q2)
- Joint Workshop at CEM/MI ministerial on global R&I needs for clean hydrogen from production to end-use (Q3)
- Joint call for hydrogen R&I projects in place via CET Partnership with commitment of national funding programmes (launch Sept 2024)
- Short report providing oversight hydrogen R&I activities (December 2023)
- Set up Task group ‘Future demand in Industry’ and presentation workplan in collaboration with MI Net Zero Industries (Q1/Q2)
- Identification of and support to 100 Hydrogen valleys (continued 2023)
- Hydrogen Exchange (increasing global interest – Latin-America (continued) – Africa (new))
- Knowledge exchange – 6 workshops on regulatory issues/finance/standards to enable demonstration actions and hydrogen valleys
- Increase industrial engagement

**Coordinating initiatives**
- MI Clean Hydrogen Mission
- IEA’s Hydrogen and Fuel Cells TCPs

**COP29 Deliverables:**
- Short stock take report ‘Towards 100 Hydrogen Valleys - 2024’
- Launch of first global R&I agenda for clean hydrogen development towards achieving USD 2/Kg.

**COP30 Deliverables:**
- Short stock take report ‘Towards 100 Hydrogen Valleys- 2025’
- Report on ‘Flagship R&I projects along the value chain from production to end-use’
# CORE PRINCIPLES

## Task Portfolio (more bottom up approach)

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<td>PP - H2 Materials for Energy Storage</td>
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...To be completed by a « Top Down » approach to fulfill the gaps with Strategic plan (Strategic Plan and Task Portfolio Alignment ExCo Task Force)
CORE PRINCIPLES

Strategic Activities

- TRL Assessment
- Hydrogen TCP Awards of Excellence
- Contact database of hydrogen experts
- Participation in GREET+ Project
- IEA TCPs network Coordination Group
HYDROGEN TCP
LEADERSHIP TEAM

Chair
Lucchese Paul
paul.lucchese@cea.fr

Vice Chair
Weeda Marcel
marcel.weeda@tno.nl

Vice Chair
Eric Miller
eric.miller@ee.doe.gov
Conclusions:
Main evolutions of 2025-2030 SP compared to 2020-2025 SP

• Larger geographical diversity of members

• More work on analysis, economics, socio-economics, geopolitics, regulatory framework, LCA and all non-technological parameters

• More integration and collaboration in the TCPs network: synergies, joint work and stronger collaboration with IEA secretariat

• Strong integration in the international collaboration initiative Landscape

• Development of a « Strategic activities Portfolio » besides the task portfolio

• Continue to modernize internal operations and internal efficiency, increase flexibility, develop experts database, develop more short deliverables and quick answer
THANK YOU!