



**Mission Innovation Clean Hydrogen Mission**  
**10<sup>th</sup> Plenary Meeting – 6 July 2023**  
**13:00 – 14:30 CET in WebEx**

**Present:**

*Co-leads:*

Matthijs Soede (EC) (CH Mission Director), Eirik Lonning (EC); Pete Devlin (DoE US), Lorena Steinle (NOW GmbH, Germany), Trevor Rapsom (CSIRO, Australia), Loreta Lancellotti (Ministry of Energy, Chile); Karla Chase (Ministry of Energy, Chile); Bianca Lewis (DCCEEW, Australia), Oliver Guerrero (BEIS, UK)

*Members:*

Africa Castro, Spain  
Antonio González, Spain  
Pratibha Sharma, India  
Eva González, Spain  
Xavier Montagne, France  
Abdullah Ameer, Saudi Arabia  
Margherita Matzer, Austria  
Kate Powe, Canada  
Marcello Capra, Italy  
Stefano Raimondi, Italy  
Teo Martin, Italy  
Nawal Alhanaee, UAE  
Fatma Al Saffar, UAE  
Abdelmuti Murad, UAE  
Arijeet Boruah, UAE  
Trond Moengen, Norway  
Akiteru Martuta, Japan

*Guest:*

Aage Stangeland, CETPartnership  
Isabel Cabrita, CETPartnership  
Andy Fuchs, H2Scout  
Effie Klippan, MI Secretariat

## 1. Mission direction and vision

### a. MI8/CEM14 in Goa 19-22 July 2023

#### i. Ambitions of India towards Green Hydrogen – update by Dr. Pratibha Sharma (presentation attached to the meeting report)

- National hydrogen mission was announced in January 2022, overall objective was to make India global hub for production, usage and exporter of green H<sub>2</sub> and its derivatives; this should leave to extensive decarbonisation and reduce dependence on imports
- The overall coordination of this mission is done by Ministry of New and Renewable Energy supported by other ministries
- Mission components incl. e.g.: demand creation, enabling policy framework, Green H<sub>2</sub> Hubs, pilot projects
- Mission will have two phases:
  - Phase I (2022-23 to 2025-26)** involving e.g. creating demand, enabling adequate supply by increasing electrolyser manufacturing; creating demand, enabling adequate supply by increasing electrolyser manufacturing
  - Phase II (2026-27 to 2029-30)** involving e.g. GH<sub>2</sub> expected to be at par with fossil fuel based alternatives in refineries and fertilizer; Undertake pilot projects in railways, aviation etc.
- Expected deliverables by 2030 :
  - At least 5 MMT GH<sub>2</sub> annual Production
  - 60-100 GW Electrolyser capacity
  - 600,000 Jobs
  - 125 GW RE Capacity for GH<sub>2</sub> Generation & associated Transmission network
  - 50 MMT CO<sub>2</sub> Annual Emissions Averted
  - USD 100 Billion Investment
- R&D activities on hydrogen production, storage and utilisation
- Mission innovation – recently hydrogen valleys calls were announced, screening of H<sub>2</sub>V projects has been carried out, they will be closed to the ecosystems e.g. at the coastal region for sea water electrolysis; these valleys will be in different regions, there will be more than three
- India is developing technologies across entire H<sub>2</sub> value chain, focussing on economics, scaleup, performance to realize the H<sub>2</sub> potential and to address the issues of climate changes and including international Collaborations

#### ii. Overview side events / round tables

##### Agenda CEM | CEM-14/MI-8

##### - Side events :

- Accelerating net-zero ambitions through clean hydrogen for decarbonisation of industry value chains (19/7 13.15 IST)

- Enablers for an acceleration of clean hydrogen production and uptake (20/7 13.15 IST)
- Unleashing the global potential for clean Hydrogen in ports and the maritime sector (MI CHM, MI shipping, CEM Global Ports Hydrogen Coalition) (20/7 15.00 IST)
- 22/7 13.15 IST Hydrogen -Hydrogen – the Nordic rally to the valley (Nordic Energy Research, MI CHM, MI shipping)
- 22/7 15.00 IST Launch of the International Hydrogen Trade Forum (CEM)
- **Green Hydrogen round table on 21 July 14.30-15.45 IST** - for ministers, CEOs and invited guests – closed door; three questions are suggested :
  1. *What policy and regulatory measures can governments implement to incentivize large scale green hydrogen deployment?*
  2. *What are the successful case studies or pilot projects that are boosting the production and demand for green hydrogen?*
  3. *How can the CEM and MI platforms be leveraged to address some of the barriers impeding the acceleration of green hydrogen deployment and innovation?*
- More information can be found at: Home | CEM-14/MI-8 ([cem-mi-india.org](http://cem-mi-india.org))
- On-line platform to joint side events will be communicated later

## **b. Workplan 2023 – KPIs**

- MI secretariat / Technical Advisor Group are asking to report using different KPIs
  - Inputs – these include areas such as resourcing, both financial and personnel.
  - Outputs – including published reports, webinars and other engagement metrics
  - Outcomes – the broader advances within the mission field of activity that may or may not be directly attributable to the mission but may steer its activities.
- The current proposal is a draft for discussion and comments and will be finalised in September
- It should not put too much burden on the team, however more reporting is expected from the mission so we shall be prepared to be able to implement

## **2. From Action to Implementation – Pillar updates**

### **a. Pillar updates**

#### **Pillar 1: Production Working Group (UK/ Oliver Guerrero of BEIS)**

- Planning workshop activity focused on showcasing R&I to support the mission’s overall goal
- Reached out to all members with a survey to identify the priorities; if you have not replied yet your feedback is still welcome in order to shape this activity  
*reach out directly to [Oliver.Guerrero@beis.gov.uk](mailto:Oliver.Guerrero@beis.gov.uk)*
- 1<sup>st</sup> Workshop will be on 17 July 2023 on scaling up (PEM) electrolysis particularly focused around electrolyser development, speaker will come from TNO - Netherlands Organisation for Applied Scientific Research

### **Pillar 1: Distribution and Storage working group (Aus/Trevor Rapson of CSIRO)**

- Collected case studies internationally of Distribution and Storage, a big thank you to all of you who have provided with input
- The map is now online and will be officially launched in Goa on 19 July during a side event: Accelerating net zero ambitions through clean hydrogen for decarbonisation of industrial value chains 19 July

**<https://www.csiro.au/en/maps/Hydrogen-storage-and-distribution>**

- 10 countries have contributed with 42 case studies, 24 demonstration projects, 18 translational research projects, 24 distribution focus, 29 storage focus
- Technology focus is on pipelines (12), liquid carriers (9), underground storage (7) and liquid hydrogen (5)

### **Pillar 1: Offroad working group (USA/Pete Devlin of DoE)**

- Start of this WG at the joint workshop between US, EU, Australia, Chilly in 2021 since then monthly meetings every third Friday
- Global participation from >40 organizations – 130+ active members – monthly Group & Team meetings
- Focused on mining vehicles primary but also agriculture and construction
- Now expanding to include rail locomotives
- WG topics: e.g. TCO Analysis, Develop a project list of global projects, Determine key data for collection (fuel cell durability, refueling rates volumes, etc.), Develop cost and performance for mining equipment applications, Convene a workshop / webinar with Center For Hydrogen Safety and other stakeholders to identify required training
- You are welcome to join the group, please contact [peter.devlin@ee.doe.gov](mailto:peter.devlin@ee.doe.gov)

### **Pillar 2: Demonstration/Hydrogen Valleys (EU/Matthijs Soede of European Commission)**

- As of today, 83 H2V are listed on the platform H2Valleys | Mission Innovation Hydrogen Valley Platform
- Spread over 33 countries, not only in MI- countries
- The increase is very positive, from 32 hydrogen valleys in 2022 to 80 in May 2023
- The latest count of 14 June is 83
- One of the commitments of CHM is for each country to have and support at least three H2V
- The total target is to reach 100

## **Pillar 2: Hydrogen Exchange (Germany/Lorena Steinle of NOW)**

### **Sprint 2: Hydrogen Exchange Program**

- In this WG we support non-MI countries in development of hydrogen projects
- A series of workshop was developed the first will focus on the region of Latin America
- The workshop that is jointly developed with Pillar 3 will be on 12 July on Regulatory Framework & Certification, this event is prepared in collaboration with OLADE, Spain, Chile and Germany (currently more than 300 registered participants)
- The following sessions will be in August, September, October and November

#### **b. Guest speakers**

##### **i. CET Partnership / Isabel Cabrita/Aage Stangeland – The CET Partnership will launch in September a new call for joint hydrogen projects. Countries are invited to support this initiative (presentation attached to the meeting report)**

- CETP is a partnership of national and regional research, development and innovation (RDI) programmes in European Member States and Associated Countries, and also United States and Canada, India joined this week
- Ambition is to boost and accelerate the energy transition
- The Partnership is setting up annual calls for RDI applications
- The 2023 call is currently open at <https://cetpartnership.eu/calls/joint-call-2023>, the scope is very broad from renewable energy production to CCUS and energy efficiency in industry and buildings
- The call is focused on technology, the priority is to have project focused on technology development, ideally project with demonstration of new technologies (focusing on blue and green H<sub>2</sub>), projects should aim at TRL 5-9
- **New partners are very welcome to join!** Wanted: funding agencies interested in joining this call and having a budget available within this call, no money flow across border is possible which means that all funding partners would fund the partners from their country
- CETPartnership will have a side event in Goa

##### **ii. H2Scout / Andy Fuchs – The H2Scout tool facilitates hydrogen integration into regional planning and transition activities. This tool is helping regions to develop their hydrogen valleys. It is tested in Germany (presentation attached to meeting report)**

- Home ([toyotamobilityfoundation.org](http://toyotamobilityfoundation.org)): mobility has to be safe, sustainable, affordable and convenient for that we are looking also on energy

- Sustainable Cities Challenge has been just launched to give out 9M USD to two cities to address the issues of inclusion, resilience and decarbonised solutions to solve various mobility issues e.g. traffic safety, support people with mobility challenges, hydrogen/energy
- H2Scout for Regions
  - The H2Scout facilitates hydrogen integration into regional energy planning and transition activities by identifying cost-optimizing infrastructure settings for regional resourced hydrogen production, and quantifying cost and benefits compared to the fossil system in place.
  - Regions may define unlimited sets of scenarios, differing in use of resources, assumptions on (future) cost and willingness-to-accept, energy and climate strategies. The H2Scout empowers regional stakeholders to understand impacts of assumptions by comparing system performances of the scenarios.
  - As the energy transition is yet under construction, it is likely that system framework and assumptions change with time. To understand the impacts of these changes, regions may alter a selected set of assumptions and apply it to an existing infrastructure system. The main KPI will reflect system performance under these sub-optimal conditions.
- Everything is on-line, once you register you can develop a concept, put description, your stakeholders can have access, via the tool you search for available technologies; as a result you will get cost-optimized infrastructure setup incl. system performance (KPIs)
- Technical workshop with live demonstration will take place on Wednesday, 26th of July, 13:00 – 15:00 CET
- For more information and to register for the workshop contact Andy at [andy.fuchs@toyota-europe.com](mailto:andy.fuchs@toyota-europe.com)

### **3. Round table – (all members) – update on individual activities to support the implementation of the Clean Hydrogen Mission Action Plan**

Nawal Alhanaee, UAE:

- National hydrogen strategy launched on 3 July
- By 2031 there shall be two hydrogen oasis / hydrogen valleys

Africa Castro, Spain

- Revision of the energy and climate plan has been submitted to the European Commission last week, Spain has increased the objective of the electrolysis capacity from 40 GW to 11 GW by 2030
- Spain is currently chairing the presidency of European Union Council and has organized an event on ministerial level devoted to hydrogen

Carla Chase, Chile

- Working on Action plan on hydrogen to support the National hydrogen strategy
- Also working on Regulatory action plan 2023 – 2030

Margherita Matzer, Austria:

- Three hydrogen valleys will be developed, one of them together with Bulgaria and Italy
- On line meeting to get input from hydrogen community in Austria, follow-up of this meeting in September

Peter Devlin, US:

- Preparing the announcement on hydrogen hubs that is planned for September, Federal consensus meetings have just finished in evaluating the best proposals
- 1-2 billion USD will go to regional hydrogen valleys and hubs
- Large (also PEM) electrolyser research solicitation has been published

#### **4. Any other business**

- CHM Hydrogen Safety Detection Technology Report (METI Japan) available on the website Clean Hydrogen Mission – Mission Innovation ([mission-innovation.net](https://mission-innovation.net))
- Monday 10 July 2023 EU-Japan workshop with contribution from MI CHM
- Next Plenary Meeting: 14 September