

Clean Hydrogen Mission Overview - MI Annual gathering - March 2023

Description	
Key contacts	Mission Director: Matthijs Soede (matthijs.soede@ec.europa.eu) MI Secretariat Liaison: Stephanie Klak (interim basis) (stephanie.klak@nrcan-rncan.gc.ca)
2030 Goal	Increase the cost-competitiveness of clean hydrogen by reducing end-to-end costs to a tipping point of 2 USD/kg by 2030.
Mission Scope	<ul style="list-style-type: none"> • R&I – Reducing hydrogen production costs; large-scale storage and compression technologies, and end-use technologies in different sectors. Environmental research, and research and development of enabling technologies (hydrogen detection technologies, new materials, recycling) are included • Demonstration of hydrogen technologies via the build of Hydrogen Valleys – Demonstrating production, storage, distribution, and end-use in a defined area bringing supply and demand together. • Stimulating an enabling environment for the development of a hydrogen economy: <ul style="list-style-type: none"> - Identify efforts needed to stimulate demand, diffuse, and deploy emerging solutions, - Facilitate the creation and diffusion of non-technological and non-commercial knowledge - Generate positive engagement from local stakeholders to facilitate the deployment and growth of hydrogen valleys

Deliverables		
Action	Concrete Deliverable(s) for 2023	Details
<i>List sprint and non-sprint activities to support the 2030 goal. These could unfold over multiple years</i>	<i>For each action, what are the specific outputs for 2023? Please indicate deliverables that are SMART: specific, measurable, achievable, realistic, and time-bound. E.g. “Publish list of demo projects by September 2023”; “Announce new joint funding call by December 2023.”</i>	<i>For each deliverable, elaborate on how this will be achieved. E.g. “List of demos to be published on MI website”; “Topic for new joint funding call to be decided by June 2023...”</i>
Pillar 2/ Sprint 1 100 Hydrogen Valleys	<ul style="list-style-type: none"> • Identify 100 hydrogen valley regions globally that are willing to develop concrete project ideas/plans by Q4/2023 	<p>All MI CHM members will be approached to identify hydrogen valley/hubs regions (Q1/2023).</p> <p>All projects will be analyzed if they comply with the criteria and to see in which stage of development they are (plan, feasibility study, pre-FID, FID, deployment, operation) (Q2-Q4/2023).</p> <p>A comprehensive survey on project fundamentals, technologies deployed, project development overall, financial aspects as well as hurdles and key success factors will be done to enable best practice exchange, learning and identify need for support. (Q3/2023)</p> <p>All valleys will be listed at the Hydrogen Valley Platform.</p>
	<ul style="list-style-type: none"> • Launch the Hydrogen Valley Platform at the World Hydrogen Summit Rotterdam May 2023 	Re-launch www.h2v.eu with additional functionalities to enable match-making and stimulating interactions with members of the platform. Will be implemented by EU Clean Hydrogen JU/contract with Roland Berger.

	<ul style="list-style-type: none"> • Award a Hydrogen Valley Mission label to identified hydrogen valleys in Q4/2023 (European hydrogen week) 	<p>Assessment if the project fits regarding the Hydrogen Valley definition, and the project will be featured on the platform and joins the circle of successful peers from around the world. All Hydrogen Valleys on the platform will receive an H2.0 Valley Certificate. They are thus recognised and certified by Mission Innovation and the EU Clean Hydrogen Joint Undertaking as a global Hydrogen Valley flagship.</p>
Pillar 2/ Sprint 2 Hydrogen Exchange	<ul style="list-style-type: none"> • Identification of needs of non-MI countries to develop hydrogen economy and development of support programme for these countries to develop Hydrogen Valleys/projects Q1-Q3/2023 	<p>First workshop alongside MI/CEM annual gathering in Brazil for all countries in South America.</p>
	<ul style="list-style-type: none"> • Developing concepts and options for a Global Hydrogen Valley Project Development Assistance (PDA) Network Q3/2023 	<p>Based on the PDA services supported by the EU Clean Hydrogen JU the set up of a global network will be explored to set-up hydrogen projects/valleys in MI countries in support of the Sprint 1 and 2.</p>
Pillar 1/R&I	<ul style="list-style-type: none"> • Series of workshops in the field of clean hydrogen production, distribution and storage and end use applications R&I (Q1-Q4/2023) • Identification of best practice case studies/promising technologies in the different fields (June 2023) • Analysis report on best practice case studies (December 2023) 	<p>International workshops on key R&D gaps requiring research/innovation to meet the MI goal of 2 USD/EUR per kg from production of clean hydrogen to end use. Results can be used to define joint research/innovation projects.</p> <p>Topics for the Production Working Group will be decided in Q2, with the identification of best practice case studies across Q3 and Q4, and working groups convened during Q3 and Q4.</p> <p>Topics covered in workshops conducted by the End Uses Working Group will include hydrogen for open pit mining vehicles, cargo handling equipment, and safety detection equipment for off road applications.</p> <p>Analysis and determine the best way that MI can contribute to helping drive down the costs associated with storage and distribution of clean hydrogen.</p>
Pillar 1/R&I	<ul style="list-style-type: none"> • Announce joint funding call for clean hydrogen projects under the umbrella of the EU Clean Energy Transition Partnership with at least 3 non EU MI countries. Q3/2023 	<p>https://www.cetpartnership.eu https://cetpartnership.eu/tri/3</p> <p>This partnership has organized joint calls in different areas of clean energy transition, from renewables to system integration. In the so-called transition initiative 3 they are looking for solutions for storage technologies, hydrogen, and renewable fuels. Focus was on projects aiming TRL or above.</p> <p>More info:</p>

		<p>TRI 3 Office TRI3@cetpartnership.eu Ragnhild Rønneberg (RCN,NO) rr@forskningsradet.no</p>
Pillar 3/Enabling environment	<ul style="list-style-type: none"> Series of workshops in the knowledge areas of Finance, Regulations, and Codes and Standards. (Q2-Q4/2023) 	<p>No duplicative work with other international initiatives Focus will be on awareness raising and knowledge exchange.</p> <p>1st knowledge area Finance Objective: Explore how to best leverage private capital towards the clean hydrogen economy. Activities: 1. Share existing best practices among public entities 2. Gather input about risks from the private financial value chain 3. Guidelines public tools to address financial value chain risks.</p> <p>2nd knowledge area Regulations: Objective: Best practice exchange in building a regulatory framework to support the development of a hydrogen economy.</p> <p>3rd knowledge area Codes and Standards: Objective: Increased knowledge regarding Codes and Standards in support of the in building a regulatory framework to support the development of a hydrogen economy (in collaboration with IPHE)</p>
<p>Future deliverables:</p> <ul style="list-style-type: none"> Annual joint calls for clean hydrogen projects under the Clean Energy Transition Partnership till 2027. The number Hydrogen Valleys presented at the revamped H2V.eu platform will be at least 100 by 2024. The Hydrogen Valleys presented at the H2V.Eu platform are moving forward from Idea to pre-FID phase to implementation and operation. By 2027 FID taken for at least 70 Hydrogen Valleys. The set-up of a project development assistance network (2024/2025) A new International Investment Guide (2024) 		

Resourcing		
Co-lead	Specific Contributions in 2023	Key Contact
	<p>Members to indicate how they are contributing to the Mission's 2023 deliverables.</p> <ul style="list-style-type: none"> E.g. "Lead for Pillar X" E.g. "FTE for Mission communications" E.g. "Funding contractor to develop knowledge sharing platform" <p>E.g. "Funding (or planning to fund) a demo project in support of the Mission's sprint"</p>	<p>Name(s) of main contacts</p>

	<i>(share scope, funding details, timelines if known).</i>	
EC	<ul style="list-style-type: none"> • Provide the mission director, overseeing coordination of Mission activities; • Coordination of Finance knowledge group Pillar 3 • In collaboration with EU Clean Hydrogen JU coordination of Sprint 1 on Hydrogen Valleys, and Hydrogen Valley Platform. 	Matthijs Soede Matthijs.Soede@ec.europa.eu Vendula Jirouskova Vedula.Jirouskova@ec.europa.eu Eirik Lonning Eirik.Lonning@ec.europa.eu
Australia	<ul style="list-style-type: none"> • Pillar 1: Overall coordination of R&I Distribution and storage focus area 	Trevor Rapson Trevor.Rapson@csiro.au Bianca Lewis bianca.lewis@dcceew.gov.au
Chile	<ul style="list-style-type: none"> • Pillar 3: Overall coordination of knowledge areas Regulations, Codes and Standards and Finance 	Loreta Lancellotti llancellotti@minenergia.cl
UK	<ul style="list-style-type: none"> • Pillar 1: Overall coordination of R&I Clean Hydrogen production focus area 	Oliver Guerrero Oliver.Guerrero@beis.gov.uk
USA	<ul style="list-style-type: none"> • Pillar 1: Overall coordination of R&I Hydrogen End-use focus area 	Peter Devlin Peter.devlin@ee.doe.gov
Member	Specific Contributions in 2023	Key Contact
Germany	<ul style="list-style-type: none"> • Coordination of Pillar 2/sprint 2 collaboration with non-MI countries • Contributing to Pillar 2/sprint 1 (Steering Committee Roland Berger, promotion of the platform through different stakeholders, etc) 	Lorena Steinle lorena.steinle@now-gmbh.de Iulia Dolganova Iulia.Dolganova@bmwk.bund.de
Austria	<ul style="list-style-type: none"> • Coordination Net-Zero-Industries • Identification of hydrogen best practice end-use in collaboration with Net-Zero-Industries mission 	Horst Steinmueller (WIVA) steinmueller@wiva.at
Canada	R&I Pillar: <ul style="list-style-type: none"> • Participate in Hydrogen Off-Road Working Group • Participate in Distribution and Storage Working Group • Facilitate collaboration with the NZI Mission on their Global Knowledge Exchange Project Hydrogen Valleys: <ul style="list-style-type: none"> • Support requests for information/input. • Enabling Environment Pillar: • Participate in Finance and Investment Working Group • Contribute to ad hoc knowledge sharing workshops and webinars 	General: Kate Powe kate.powe@nrcan-rncan.gc.ca Claudie Roy Claudie.Roy@nrcan-rncan.gc.ca Off-Road Working Group: Rene-Pierre Allard
China	<ul style="list-style-type: none"> • Tbd 	Prof Hongxian Han hxhan@dicp.ac.cn

Finland	<ul style="list-style-type: none"> Contributing to work on pillar 3 Finance knowledge area Tbd 	<p>Katja Hollmen katja.hollmen@businessfinland.fi</p> <p>Juho Korteniemi Juho.Korteniemi@tem.fi</p>
France	<ul style="list-style-type: none"> Contributing to work on pillar 3 Tbd 	<p>Tudor Florea tudor.florea@developpement-durable.gouv.fr</p> <p>Fabien Delafalize - DGEC/DG fabien.delafalize@developpement-durable.gouv.fr</p>
India	<ul style="list-style-type: none"> Tbd 	<p>Dr. Ranjith Krishna Pai ranjith.krishnapai@gov.in</p>
Italy	<ul style="list-style-type: none"> Tbd 	<p>Raimondi Stefano raimondi.stefano@mase.gov.it</p>
Japan	<ul style="list-style-type: none"> Organizing and conduction workshops Cargo handling (February) / Safety detection (March) Tbd 	<p>Kono Yuko kono-yuko@meti.go.jp</p>
Morocco	<ul style="list-style-type: none"> Tbd 	<p>Ayoub Hirt hirt@iresen.org</p>
Netherlands	<ul style="list-style-type: none"> Support to Hydrogen Valleys sprint 1 Tbd 	<p>Lisanne Brummelhuis l.k.m.brummelhuis@minezk.nl</p> <p>Feenstra, drs. J.D. (Han) j.d.feenstra@minezk.nl</p>
Norway	<ul style="list-style-type: none"> Coordination Joint Funding Call via EU CET-partnership Tbd 	<p>Trond Moengen trond.moengen@energidata.no</p> <p>Ragnhild Rønneberg (RCN,NO) rr@forskningsradet.no</p>
Republic of Korea	<ul style="list-style-type: none"> Tbd 	<p>Mr. Gwonho Jeong jkwon5@korea.kr</p>
Saudi Arabia	<ul style="list-style-type: none"> Tbd 	<p>Abdullah Al Ameer Abdullah.Ameer@moenergy.gov.sa</p> <p>Faisal Al Musa Faisal.Musa@moenergy.gov.sa</p> <p>Faisal Al Qurooni Faisal.Qurooni@moenergy.gov.sa</p>
Spain	<ul style="list-style-type: none"> Support to Pillar 2 /Sprint 1+2 Tbd 	<p>Africa Castro africa.castro@h2b2.es</p>
UAE	<ul style="list-style-type: none"> Tbd 	<p>Fahad Mohamed Alhammadi fahad.alhammadi@moei.gov.ae</p>
Organizations / Private Sector	Specific Contributions in 2023	Key Contact
CEM Hydrogen Initiative	Collaboration with ports initiative	Jose Bermudezmenendez JoseMiguel.BERMUDEZMENENDEZ@iea.org
IEA Hydrogen TCPs	Support in the collection of best practice cases under pillar 1	Marina Holgado marina.holgado@ieahydrogen.org
IPHE Secretariat	Workshop codes and standards Q3/4	Laurent ANTONI/ Tim Karlsson tim.karlsson@iphe.net
UNFCCC, Green	N/A	https://climatechampions.unfccc.int/green-

Hydrogen Catapult / Climate Champions		hydrogen-and-green-shipping/
World Bank Group, ESMAP	Contribution to workshops related to Sprint 2 development of hydrogen economy in non-MI countries.	Carolina Lopez slopezrocha@worldbank.org Dolf Gielen dgielen@worldbank.org
WEF, Accelerating Clean Hydrogen Initiative	Linking WEF's 'Transitioning Industrial Clusters towards Net Zero Initiative' with the development of Hydrogen Valleys	Noam Boussidan Manager, Transforming Industrial Ecosystems World Economic Forum Noam.Boussidan@weforum.org

Resourcing Needs/Gaps

For almost all members the specific contributions to the Mission needs to be defined in more detail. For the workplan 2023 this will be done in March/April.
All members of the Mission committed to stimulate research and innovation, to support the development of hydrogen valleys in their countries, to stimulate knowledge exchange and to work together towards the goals of the Mission.

South Africa and Israel have expressed their interest to join the Clean Hydrogen Mission. Focus of the contribution of South Africa might be on the skills agenda. A potential new knowledge area under Pillar 3 Enabling measures. Best practice exchange on the development of local/global hydrogen skills agenda/ Clean Hydrogen Academy.

Collaboration/synergies with other MI Mission will be sought during MI Annual gathering.

The UNFCCC/Green Hydrogen Catapult is a global initiative convened with the support of the UN High Level Champions for Global Climate Action and hosted by RMI. It was founded and is led by a group of leading global industrials aiming to accelerate green hydrogen adoption at scale. Members include ACWA Power, ArcelorMittal, CWP Global, Fortescue Future Industries, H2 Green Steel, Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, Power-2-X, and Yara. Focus was lately more on Zero-emission shipping.

In the very dynamic hydrogen space resourcing of new initiatives is very difficult, since the shortage of resources which many members are facing. To realize the Missions' ambition it is important that members are making resources available to stimulate R&I in their own countries but also stimulate cooperation. Resources are needed as well for the development of hydrogen valleys. Part of the commitment that each members will the development of 3 valleys.

Stakeholder Engagement

Private sector organizations (not listed above as members)	<p><i>Provide a short description of private sector engagement efforts to date and/or forthcoming plans. E.g. Does the Mission have a private sector stakeholder engagement plan? Do stakeholders participate in meetings? Do stakeholders provide feedback on reports or sprint ideas? Are stakeholders providing funding for resourcing the Mission?</i></p> <p>Status of private sector engagement efforts: Private sector is invited to contribute to the workshops. Hydrogen Council Strategic advice via the international platform coordination. Joint calls for research collaboration academia/research/industries. The development of Hydrogen Valleys is mainly driven by the private sector. Regional public/private partnerships are needed to drive them forward.</p> <p>Private stakeholders are not resourcing the Mission. They provide support by contributing to workshops/discussions.</p>
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	Existing engagement with private sector entities: Hydrogen Council CHM member countries are engaged with national hydrogen sector alliances.
Other initiatives / organizations <i>(not listed above as members)</i>	<i>List other initiatives/organizations the Mission is engaging. E.g. Other MI Missions, CEM initiatives, Mission Possible Partnership, First Movers' Coalition or Breakthrough Agenda, where relevant.</i> Existing and/or potential collaborations: Breakthrough Agenda – Hydrogen Breakthrough – the MI Clean Hydrogen Mission is taking the lead in BA priority action 3 on Research and Innovation stimulating demonstrations. The Mission contributes to other priority areas.

Communications	
Key events in 2023	Forthcoming: 17 March: hybrid event ‘Workshop Hydrogen Detection Technologies for Safety’. Other workshops will follow: see deliverables
Potential 2023 announcements	Upgraded Hydrogen Valley platform (May 2023) Announcement of identified Hydrogen Valleys + Hydrogen Valley certificate (November 2023)
New comms activities	<i>List any plans for new comms channels or major activities. E.g. A Mission LinkedIn page; website for knowledge sharing; hero video.</i> https://www.linkedin.com/company/clean-hydrogen-mission/?viewAsMember=true A linked-in page has been set-up and has currently >200 followers. Workshops are announced via this page. Aim is to enlarge the number of followers to >1000 by December 2023.