Clean Energy Ministerial - Hydrogen Initiative (H2I)

Work Plan 2023

Plane approved in the Advisory Group meeting on 14 February, 2023

PREAMBLE

Purpose of this Work Plan

The intention of this document is to provide a comprehensive overview of the CEM Hydrogen Initiative (H2I) and the actions that will be carried out over the next year. The document also spells out the H2I objective, mission, scope, focus areas, operation and actions for the implementation in 2023.

Objective of H2I

The H2I is a multi-government collaborative initiative that aims to raise international ambition and advance commercial scale clean hydrogen and fuel cell related deployment in the long-term globally, across all sectors of the economy via analysis, policies, programs and projects that would make hydrogen a key enabler in the global clean energy transition. Having most relevant initiatives included in this comprehensive multi year work plan ensures key hydrogen results, advancements and progress can be leveraged within the context of the global coordination and profiled to Energy Ministers in the context of the greater energy transition.

The Mission of the H2I

The Initiative intends to:

- Build strategic partnerships to develop and facilitate global actions on clean hydrogen and fuel cell related deployment across regional, national, and municipal economies;
- Encourage global deployment projects, and empirical analysis to advance understanding of the clean hydrogen and fuel cell technology market, and provides an evidence-base for policy and program development;
- Facilitate and inform the development of policies and programs to enable global supply chains for clean hydrogen, based on real-world actions;
- Inform decision making in governments through peer-to-peer dialogues on infrastructure deployment, policy, program and project implementation;
- Encourage the sharing and adoption of approaches that enable clean hydrogen to play a role in the global energy and transportation systems;
- Build new analytical resources that support clean hydrogen and fuel cell deployment across countries; and,
- Engage hydrogen and fuel cell stakeholders and others (e.g., infrastructure, renewable fuel) through consultations and peer-to-peer discussions.

As with all CEM Initiatives, the Hydrogen Initiative would aim to have the following components:
- Aspirational hydrogen objectives/targets;
- Annual work plans, the focus and scope of which evolve over time;
- Working groups, focused on specific themes;
- Campaigns to raise ambition levels;
- Workshops & webinars (both global and regional);
- Targeted programs;
- Analysis and studies;
- Strategic partnerships to develop and implement deployment projects;

THE INTERNATIONAL LANDSCAPE AND THE ROLE OF H2I

The H2I shares the vision of other international initiatives to advance clean hydrogen production and use around the world in the long-term. The H2I’s focus is on advancing commercial scale hydrogen and fuel cell related deployment, and complements the work of other international initiatives, such as IEA, Mission Innovation and the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE). The H2I is also a response to the call to action that the Hydrogen Energy Ministerial (HEM) in Japan issued in September 2018 and is providing a forum to implement the HEM’s Global Action Agenda (GAA), released in September 2019.

The H2I offers an opportunity to raise the visibility of international hydrogen activities to energy ministers in the larger context of the clean energy discussions and transition to a low carbon economy. Through high-level Ministerial leadership and the formal yet flexible government-to-government framework offered by the Clean Energy Ministerial (CEM), and building on the strong history of successful collaboration, the CEM-H2I will be a corner stone of public/private collaboration for commercial scale global deployment of hydrogen as a key enabler for clean energy transition, across all sectors of the economy. Strategic partnerships with private sector stakeholders, such as the Hydrogen Council, will be a starting point in several of the planned actions presented in this work plan.

Participation in CEM initiatives and campaigns is voluntary and non-binding. The CEM H2I is aimed to ensure that hydrogen remains a key element in the broader context of the global clean energy transition dialogue and provides a flexible platform for further collaboration. The H2I will fully leverage actions being taken by other CEM initiatives, recognizing the important contribution they make to the global advancement of hydrogen.

IDENTIFIED THEMATIC FOCUS AREAS FOR H2I (SCOPE)

H2I members have identified a number of focus areas for which actions and outputs to advance commercial scale clean hydrogen deployment are of particular importance over the next decade. H2I members will also closely follow the development of other international initiatives’ activities to ensure synergies and complementary, meanwhile inviting these initiatives to use the H2I as a platform to highlight actions and outputs to energy ministers and senior officials from governments around the world. The H2I focus areas are the following:

A. Improved coordination of international hydrogen activities.
Since late 2016, global interest in hydrogen has increased significantly, and there now exists several international fora through which countries are collaborating. These collaborations include RD&D (MI,
IEA-TCPs) through to enabling activities such as regulations, codes, standards and safety (IPHE) and policies, programs and projects to enable full commercialization (H2I). To fully understand this approach, and avoid duplicative efforts, ensuring collaborating countries truly benefit from formal engagement, H2I will engage with representatives from other ongoing international initiatives to identify collaboration opportunities and other relevant synergies.

B. Exchange of best practices on policy framework and long-term plan for hydrogen deployment. There is a need for long term plans, vision and goals in giving direction to technology uptake and to enable effective planning and development of consistent policies. The initiative could act as a platform for sharing of best practices and lessons for development of long-term policy frameworks domestically and to enable the development of global targets for hydrogen deployment in the context of the clean energy transition which members could align with. The work in this area could therefore involve improved understanding of hydrogen deployment policies among participating members for their clean energy transition and creating a framework/platform to enable setting global targets for raising ambitions for hydrogen deployment.

C. Support to clean hydrogen production and distribution. Hydrogen is envisioned as a key enabler in the global clean energy transition. The H2I could help address the various policy issues that are relevant for fast tracking the deployment and roll-out of clean hydrogen production (e.g. renewables, power-to-gas, conventional SMR with CCUS, small modular reactors), as well as large-scale hydrogen export, including policies related to guarantees of origin. Distribution opportunities may also be discussed, including via existing natural gas distribution infrastructure, liquefaction, and/or conversion to liquid organic carriers. Aspects of the global supply chains, including full life-cycle emissions analysis may also be included.

D. Increased use of hydrogen technologies in the transport sector. The H2I with this focus area would aim to develop a comprehensive understanding of best approaches to increase the use of hydrogen technologies in the transport sector, particularly medium and heavy-duty vehicles, rail and marine applications. Work would also entail identifying and fostering international collaboration and undertaking deployment projects.

E. Hydrogen opportunities in the industry sector. The initial focus would be on regional hydrogen opportunities in hard to abate industrial sectors (such as oil and gas, cement, steel, fertilisers). Knowledge products, guidance and partnership development will all be considered.

F. Exchange best practices on sustainable finance along the entire supply chain. The initial focus would be identifying and developing best-practices, and guidance on attracting and de-risking the capital investments required along the entire supply chain to achieve commercial scale hydrogen deployment.

G. Urban energy system as the enabler for hydrogen deployment In addition to industry, cities would be at the forefront of a significant share of Hydrogen deployment – adequate municipal policies, strategies and planning required to enable urban centers to mainstream hydrogen use for various applications (commercial, transport, heating, etc.). H2I would act as a global
forum to enable exchange of ideas, best practices and lessons from across leading cities which are aiming to fast track hydrogen deployment.

**H2I OPERATIONS**

H2I is led by a ‘Core Team’ composed of the H2I members Canada, European Commission, Japan, the Netherlands and the United States.

The decision-making and strategic body of H2I is the ‘Advisory Group’ which is composed of policy-leads from all participating H2I member countries.

The International Energy Agency (IEA) has been selected to be the ‘Coordinator’ for the initiative. Further details on the governance are included in the CEM Hydrogen Initiative Coordination Framework.

The following functions are key for H2I to deliver actions and outputs.

**H2I Advisory Group Meetings.**

H2I members will meet twice per year to review progress and to discuss plans and priorities. Advisory Group meetings should if possible be co-located with other initiatives, such as IPHE and HEM. IEA, as the Coordinator of the H2I, will work closely with the Core Team in the preparations of the Advisory Group meeting.

**Working Groups.**

H2I members may establish global or regional ‘working groups’ linked to the focus areas identified above. The working groups should be composed of H2I members and relevant participants from the private sector and non-governmental organisations. A working group should present a work plan to the Advisory Group upon launching and report on progress at least once a year.

**Strategic Deployment Projects.**

H2I members are encouraged to foster “strategic deployment projects” with industry linked to the focus areas identified above. These projects aim to showcase successful applications of hydrogen and fuel cell technologies in industry, transportation and community. The aim of these projects is to support future policy-making and replication. Project concepts can be brought forward to the Advisory Group for consideration and information at any time. Projects may also be identified and developed as a result of discussions carried out through the working groups or at other meetings with relevant stakeholders, such as the inaugural H2I meeting in Vancouver in May 2019.

**Workshops and Webinars.**

H2I members are encouraged to organise workshops and webinars on topics linked to the focus areas above (e.g. hydrogen use in industrial ports, and sustainable financing). Members are encouraged to involve industry (e.g. Hydrogen Council) to prepare and participate in the workshops and webinars.

**PROPOSED ACTIONS AND OUTPUTS 2023**
The H2I will during 2023 prioritise the following actions, subject to available funding, with the aim of advancing commercial scale hydrogen production and use.

Activities of the Coordinator

1. Establishing CEM H2I in the international hydrogen landscape

The IEA, as the Coordinator of the H2I, will continue collaborating with other international initiatives to improve the overall coordination of activities in the international hydrogen landscape. That dialogue will involve HEM, IPHE, MI, the Hydrogen and Advance Fuel Cells TCPs, IRENA, WEF, the Breakthrough Agenda and the Hydrogen Council. This task includes ensuring H2I’s complementarity to other initiatives and answer how the H2I could work as a platform to help levering other initiatives work. In addition, the IEA will participate in diverse international events to present H2I and to disseminate the work and the activities performed in the framework of the initiative. The IEA will report to the Advisory Group regularly on these coordination activities and will identify and propose potential joint activities and collaborations with other international partnerships that can contribute in the delivery of H2I goals.

2. Management of the H2I web

The IEA, as the Coordinator of the H2I, jointly with the CEM Secretariat has developed webpages at both the IEA and the CEM Secretariat's websites, with relevant information on activities undertaken by H2I, events organised under the umbrella of H2I, analysis prepared by the IEA and information of hydrogen deployment in the H2I countries. The IEA will keep the website updated with the support of the H2I members which will provide relevant information about developments in their countries.

https://www.iea.org/programmes/cem-hydrogen-initiative

https://www.cleanenergyministerial.org/initiatives-campaigns/hydrogen-initiative/

3. Annual Hydrogen Report

The IEA, as the Coordinator of the H2I, will present insights to H2I members on global hydrogen deployment through the preparation of a report (Global Hydrogen Review). Initially, it was proposed to present this report on a biannual basis, but given the dynamic situation around hydrogen technologies and the tremendous expectations, the IEA has decided to step up efforts and deliver an annual report. The report will track on-the-ground progress of stated government ambitions and further clean energy transition needs. It will track progress towards deployment targets, real-world investments and technology cost reductions with the objective to help decision-makers in government and industry to fine-tune their strategies to drive investment progress and identify challenges and bottlenecks. H2I members will contribute towards compiling latest data on global development and deployment, and highlight upcoming projects and joint initiatives. The report will also summarize progress on technological developments and the work of H2I and feature next-steps and key achievements. The IEA will keep the Advisory Group updated on a regular basis.

Working Group 1: Global aspirational goals for hydrogen

The working group will have two tasks:
1. **Task 1: Update tracking of global aspirational goals for hydrogen**

   The IEA will continue to track all existing country goals/targets and other approaches to integrate hydrogen in long-term plans through a modified version of the survey jointly prepared with the European Commission (EC) in 2021. This modified version of the survey will be prepared in cooperation with the IPHE and MI with the objective of preparing a single survey for the three initiatives to limit the number of surveys that the focal points of the different countries have been receiving in the last few years.

   The survey will be shared with all H2I member governments and other governments potentially interested in participating in the working group. H2I governments will fill the surveys and send them back to the IEA. The IEA will summarise this information in the Global Hydrogen Review and will use it in the analysis presented in the report.

   **Task Plan:**
   2. Circulation of the questionnaire to H2I members and other countries interested in participating: beginning of May 2023.
   3. Deadline to submit the data by the participating countries: end of June 2023.

2. **Task 2: Preparation of proposals for potential new work streams based on the results from the tracking performed in 2022**

   The European Commission (EC), with the support of the IEA, will identified a series of areas for hydrogen deployment where more effort is needed. These proposals will be based on the findings from the analysis made by the IEA in the Global Hydrogen Review 2022 which is itself based on the tracking made by the working group in 2022.

   **Task Plan:**
   1. Identification of potential new areas of work: March-December 2023.
   2. Presentation of proposals to the Advisory Group: at CEM14 or in the last Advisory Group meeting of 2023.
   3. Approval of new tasks: 2024.
   4. Launch of new tasks: 2024

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**Working group chronogram**

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**Working Group 2: Global Ports Hydrogen Coalition**

The Global Ports Hydrogen Coalition will aim to adopt a new framework for the collaboration, clarifying the mandates and modalities of the platform. As part of the new framework the responsibility for the secretariat function is transferred from the IEA Secretariat to the Port of Rotterdam (for 2023). Also, a Coalition Steering Committee will be set up in 2023, enabling a stronger leadership and direction from the ports. The Coalition will separately adopt a new workplan for 2023 with activities linked to the following core mandates: 1) port to government collaboration; 2) port-to-port collaboration; and, 3) port to other stakeholder collaboration. A representative from the Steering Committee will report to the H2I Advisory Group on the activities.

The work plan of the Global Ports Hydrogen Coalition will be developed after the transference of the secretariat function to the Port of Rotterdam and the creation of the Steering Committee.

**Task plan**

2. Approve Secretariat function and Steering Committee: tbd.
3. Discuss and adopt annual plan for 2023: tbd.

Working group chronogram to be developed after the approval of the new framework,

**Working Group 3: Roundtable on the Northwest European region**

The working group will have 4 tasks:

1. **Task 1: Dissemination of the Northwest European Hydrogen Monitor 2022**

The members of the working group, along with CEM and IEA will find opportunities to disseminate the findings of the Northwest European Hydrogen Monitor 2022 in as many fora as possible. Some initial opportunities that have already been identified are a webinar organised in cooperation with the CEM Clean Energy Solution Center and a side event in the Berlin Energy Transition Dialogue Conference in 2023.

**Task Plan:**
1. Identify opportunities to present the Northwest European Hydrogen Monitor 2022: until July 2023.
2. Event in the Berlin Energy Transition Dialogue Conference in 2023: March 2023
3. Event at the World Hydrogen Summit to position the Northwest European Region: May 2023
4. Regional meeting at CEM14 in India: July 2023 (in collaboration with other regions to present current activities and developments). Tentative title: “exchanging regional strategies to create a global hydrogen market”
5. Webinar with the Clean Energy Solution Center: tbd

2. Task 2: preparation of the Northwest European Hydrogen Monitor 2023

The IEA, with the assistance of the members of the working group, will prepare a new edition of the Northwest European Hydrogen Monitor. The report will provide an annual update of the renewable and low-emission hydrogen market developments in Northwest Europe, including Austria, Belgium, Denmark, France, Germany, Luxembourg, the Netherlands, Norway, Switzerland and the United Kingdom. The report will be informed by an expert group convened by the IEA and formed by country representatives from the public and private sector of all participating countries.

Task Plan:

1. IEA to elaborate an outline of the scope of the report: May 2023.
2. Members of the working group to approve the scope proposed by the IEA: June 2023
3. Data collection and analysis: from June to October 2023
4. First meeting of the Expert Group: July 2023
5. Second meeting of the Expert Group: September 2023
6. Release of the report: December 2023

3. Task 3: matchmaking event between potential Northwest European importers of hydrogen and global exporters of hydrogen

This is a shared task with WG4 (Hydrogen Trade). The member of the working group will work together to organise a side event on the margins of the World Hydrogen Summit 2023, in Rotterdam. This event will bring together representatives of the public and private sectors in the Northwest European region with interest in becoming importers of hydrogen, companies that are exploring the possibility of developing hydrogen production projects in countries that could become exporters and policymakers from countries in all these regions. The aim of this event will be the creation of links between the potential importers and the potential exporters to explore avenues for collaboration in addressing barriers for hydrogen trade and the development of international supply chains.

Task Plan:

1. Definition of the event format and the objectives: February 2023.
4. **Task 4: Regular meetings**

The members of the working group will organise at least two annual meetings to discuss the progress and agree on the working plan activities. One of them will be in person at the IEA Headquarters in Paris and the other one online. The in-person meeting will be to discuss priority topics, such as infrastructure developments in the Northwest European region (EU Backbone and import facilities) and to define the focus of the next edition of the Monitor activity (Task 2).

**Task Plan:**

1. In-person meeting: April 2023.
2. Second meeting online: October 2023.

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**Working Group 4: Hydrogen Trade**

Given the growing interest in hydrogen trade and based on the progress achieved by the Hydrogen Trade working group in 2022, the Netherlands, as working Group lead proposed the upgrade of this activity and create a Hydrogen International Trade Forum to foster dialogue between potential future exporters and importers of hydrogen, broadening the conversation and including also non H2I countries,
which was approved by the members of the Working Group and the H2I Advisory Group on February 2022.

It would provide a unique platform to exchange points of view on challenges and opportunities arising in setting up international hydrogen supply chains. Main focus topics will be:

- Standards, regulations, certifications
- Trade infrastructure
- Demand creation and off-take
- In-country value for exporters
- Clarify WTO trade rules

The working group will have 4 tasks:

1. **Task 1: Join forces with the other global initiatives working on the space**

   The members of the working group will seek intense cooperation with other partner organisations and initiatives, inviting them to become part of the Forum to explore potential synergies and explore potential joint activities to accelerate the development of hydrogen trade.

   **Task Plan:**
   1. Identify and connect with partner organisations and initiatives: March 2023.
   2. Establish dialogue to explore synergies: first half of 2023

2. **Task 2: High level events to present and launch the Forum**

   The members of the working group will announce the evolution of the working group at the CEM Senior Official Meeting in Rio (March 2023) to present to the CEM community the new Forum. In addition, the Forum will be launched officially in a high-level side-event in the 14th CEM Annual Meeting in India (July 2023).

   **Task Plan:**
   1. Side event in CEM Senior Official Meeting to present the forum: March 2023.
   2. Coordination of the launch event in CEM14: first half of 2023
   3. Launch event: July 2023

3. **Task 3: matchmaking event between potential Northwest European importers of hydrogen and global exporters of hydrogen**

   This is a shared task with WG4 (Hydrogen Trade). The member of the working group will work together to organise a side event on the margins of the World Hydrogen Summit 2023, in Rotterdam. This event will bring together representatives of the public and private sectors in the Northwest European region with interest in becoming importers of hydrogen, companies that are exploring the possibility of developing hydrogen production projects in countries that could become exporters and policymakers from countries in all these regions. The aim of this event will be the creation of links between the
potential importers and the potential exporters to explore avenues for collaboration in addressing barriers for hydrogen trade and the development of international supply chains.

Task Plan:

1. Definition of the event format and the objectives: February 2023.
5. Event: May 2023

3. Task 4: Biannual events

The members of the working group will organise two biannual events to discuss and agree a work plan and report to the Forum on the progress made in each of the defined actions. In this first year, the first meeting will take place in the 14th CEM Annual Meeting in India (July 2023), along with the Forum’s official launch, and the second one will take place at the end of the year.

Task Plan:

1. Preparation of proposals to define a work plan: first half of 2023.
2. First Forum meeting at CEM14: July 2023.
4. Second biannual meeting: December 2023

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<td>Invitation of participants (NLD)</td>
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<td>MS1: First biannual meeting and agreed workplan (WG members)</td>
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<td>Development of first agreed activities (WG members)</td>
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<td>MS2: biannual progress meeting</td>
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Working Group 5 – H2 Twin Cities Initiative

The US will continue to lead implementation of the H2 Twin Cities Initiative, with support from the CEM Secretariat. This activity will aim to incentivize global partnerships and enhanced collaboration between regions in different countries to accelerate hydrogen deployments and user acceptance in communities. This will be done by increasing awareness and promote best practices and information sharing on the use of hydrogen and fuel cell technologies at scale in specific regions, communities and cities through concrete targeted partnerships.

This activity will be implemented through a collaboration with other relevant partnerships including the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE). Aligned with the intent of avoiding duplication and leveraging existing partnerships and mechanisms, H2 Twin Cities will leverage the Education & Outreach Working Group (E&O WG) of the IPHE. This will permit dissemination to several thousand stakeholders and an established network.

The first round of the competition was launched in 2021 at COP26 and first recipients were announced in 2022 with mentor-mentee pairings and sister city pairings. For 2023, the H2 Twin Cities Initiative will focus on a new round of city pairings, focused on mentor-mentee partnerships and implementation for the 2022 award winners.

This working group will have two tasks:

Task 1: 2023 H2 Twin Cities (Round 2) Pairings

The members of the working group, with support/assistance from the CEM H2I coordinator will organize the awards selection criteria, update competition guidelines, call for expressions of interest, evaluation committee, awards notification, and other related tasks for the 2023 H2 Twin Cities (Round 2) competition.

Task Plan:

1. Recruiting collaborators for the initiative among H2I members: Jan-Feb 2023)
2. Define and/or update criteria and guidelines for the competition (Feb- April, 2023)
3. Launch the competition and call for expression of interest for cities/regions/communities (April 2023).
5. Announce winners (Nov.2023)

Task 2: 2022 Sister Cities Awards Implementation

The members of the working group, with support/assistance from the CEM H2I coordinator, will work with the governments of the winning cities to ensure effective oversight and coordination of the H2 Twin Cities work plan implementation. This will include helping set up calls between cities- government-H2I and reporting on H2 Twin Cities progress and achievements back to H2I.
Task Plan:

1. Share winning H2 Twin Cities (Round 1) details with national governments (Q4 2022)
2. Develop updated guidelines and evaluation criteria for selecting H2 Twin Cities winners (round 2) (Q1/Q2 2023)
3. Develop an annual presentation of H2 Twin Cities pairings' updates for the CEM H2I community (Q3 2023)

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<td>Launch of competition and call for expressions: Phase I</td>
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<td>Share winning sister city details with national governments (Q4 2022)</td>
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<td>Arrange calls between cities-government-H2I</td>
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<td>Develop an annual presentation on H2I twin cities updates</td>
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Activity 6 - Methodology for evaluation GHG emissions in hydrogen production

This activity aims to set a direct collaboration between the H2I and the IPHE. The European Commission is currently co-chairing the Hydrogen Production Analysis Task Force (H2PA TF) of the IPHE, which is working on the classification and definition for the varying types of hydrogen. The standards and methodologies developed by the H2PA TF will need to be utilised and tested in real projects to be validated. The H2I and its activities could offer a platform for this utilisation and testing. The European Commission will report regularly to the H2I Advisory Group on the progress of the H2PA TF. As the H2I develops its activities, opportunities for utilising the standards defined by the H2PA TF will be explored.
2023 High-level events of H2I and its partner organisations

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<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Location</th>
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<tbody>
<tr>
<td>February 2023</td>
<td>CEM H2I Advisory Group meeting</td>
<td>Virtual</td>
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<td>March 2023</td>
<td>CEM/MI Senior Officials Meeting</td>
<td>Rio de Janerio (Brazil)</td>
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<td>5 April 2023</td>
<td>G20 Side Event on Green H2 Ecosystem</td>
<td>Gandhinagar, India</td>
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<td>15-16 April 2023</td>
<td>G7 - Climate, Energy and Environment Ministerial</td>
<td>Sapporo (Japan)</td>
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<td>25-27 April 2023</td>
<td>39th IPHE SC Meeting</td>
<td>South Africa</td>
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<td>9-11 May 2023</td>
<td>World Hydrogen Summit</td>
<td>Rotterdam (The Netherlands)</td>
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<td>21 July 2023</td>
<td>G20 Energy Ministers</td>
<td>Goa, India</td>
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<tr>
<td>21 July 2023</td>
<td>CEM/MI Meetings</td>
<td>Goa, India</td>
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<td>September-October 2023 (tbc)</td>
<td>Hydrogen Energy Ministerial</td>
<td>Japan</td>
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<td>October 2023</td>
<td>40th IPHE SC Meeting</td>
<td>Washington DC (US)</td>
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<td>October 2023</td>
<td>H2 Americas Summit</td>
<td>Washington DC (US)</td>
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<td>November 2023</td>
<td>European Hydrogen Week</td>
<td>Brussels (Belgium)</td>
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<td>November 2023</td>
<td>UNFCCC COP28</td>
<td>Abu Dhabi (UAE)</td>
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A detailed and updated calendar of hydrogen related events will be prepared jointly with all the international hydrogen organisations will be available for consultation by CEM H2I members and partners.