IEA Hydrogen Roadmap

Asia Workshop in co-operation with NEDO
June 26/27, 2014
HOTEL Mt.Fuji, Yamanashi Prefecture

Agenda

During the Asia Workshop we are expecting detailed and constructive discussions centred around the roll-out of hydrogen technologies in the Japan and other Asian countries. Stakeholders from industry, government and academia will provide their view on technology, infrastructure, market development and policy expectations in North America.

Day 1 - June 26

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tr>
<td>9:00-9:15</td>
<td>Welcome Message</td>
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<tr>
<td></td>
<td>• Dr.Cecilia Tam / Head of Energy Demand Technology Unit, IEA</td>
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<td>• Dr.Michio Hashimoto / Director General, New Energy Technology Dpt, NEDO</td>
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<td>• Mr.Toshio Hirai / Yamanashi Prefecture</td>
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<td>9:15 – 10:15</td>
<td>Opening of the workshop - Context for the day:</td>
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<tr>
<td></td>
<td>• IEA Roadmap Vision/Scope/Structure/Process, IEA / Cecilia Tam, IEA</td>
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<td></td>
<td>• Objectives/Role of H2 Roadmap/ Expected Outcomes of Workshops</td>
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<td></td>
<td>/Alexander Körner, Energy Analyst, Energy Technology Policy Division, IEA</td>
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<tr>
<td></td>
<td>Introduction: Presentation (15 min.)</td>
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<td></td>
<td>• Japan's Policy on Hydrogen Energy</td>
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<td>/ Chihiro Tobe / Director for Hydrogen and Fuel Cell Promotion</td>
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<td>Office, Ministry of Economy, Trade and Industry</td>
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<td>10:15– 10:30</td>
<td>Coffee break</td>
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<td>10:30-12:00</td>
<td>Transportation – Fuel cell vehicle technology and market introduction</td>
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<td>Moderator: Cecilia Tam, Alexander Körner / IEA</td>
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<td>Presentations (15 min) on technology development and milestones:</td>
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<tr>
<td></td>
<td>• Fuel cell vehicle demonstration and hydrogen infrastructure projects</td>
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<td></td>
<td>– Lessons learned</td>
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<td>/ Yoichi Sone, General Manager, FCV/Infrastructure Technology Dep. HySUT</td>
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<tr>
<td></td>
<td>• FCV development of Toyota</td>
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<tr>
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<td>/ Seiji Sano, Project General Manager, R&amp;D Management Div. Toyota</td>
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<td>• FCV development of Nissan</td>
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<td>/ Takuya Hasegawa Senior Innovation Researcher, Nissan</td>
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<td>• FCV development of Honda</td>
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<td>/ Kazunori Watanabe, Chief Engineer, HEET, Planning Division, Honda</td>
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<td>• Fuel Cell development in Korea</td>
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<td>/ Jonghee Han, Principal Researcher, Fuel Cell Center, KIST</td>
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<td>Discussion session, possible relevant topics:</td>
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<tr>
<td></td>
<td>• Fuel cell development – Cost, size, durability</td>
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<td>• Fuel cell assembly and economies of scale</td>
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<td>• Fuel cell and vehicle platform</td>
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<td>• FCEV market introduction and time line</td>
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<td>• Vehicle to home as back-up power solution</td>
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<td>12:00-13:30</td>
<td>Lunch (breakout opportunities)</td>
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<td>Time</td>
<td>Session Title</td>
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| 13:30-14:30      | Hydrogen infrastructure – Regional roadmaps for H2 transmission and delivery | Cecilia Tam, Alexander Körner   | IEA | 15min                     | Recent development for H2 Station in Japan /Toshio Waku, Deputy General Manager, Frontier Research Laboratory, Central Technical Research Laboratory, JX Nippon Oil & Energy  
Hydrogen Industry and Association of Korea /Junbom Kim, Vice President, Korea Hydrogen Industry Association |
|                  | Discussion session, possible relevant topics:                               |                                 |     |                           | Roll-out plans and investment needs  
Synergies with existing H2 generation/transmission infrastructure  
Lessons learned from demonstration projects  
Refilling infrastructure – barriers and challenges |
| 14:30-15:30      | Supply for hydrogen                                                          | Cecilia Tam, Alexander Körner   | IEA | 15min                     | Possible sources in the near term /Haruki Motegi, Consultant, Science Solution Division, Mizuho Information & Research Institute  
Possible sources and associated costs in the long term /Masaharu Sasakura, Senior Researcher, Research and Development Division, IAE  
Imported hydrogen /Yoshimi Okada, Principle Researcher, Technology Development Unit, Hydrogen Supply Chain Development Unit, Chiyoda Corporation  
Towards greener hydrogen production in China /Tiejun Zhao, Professor, CAS Key Laboratory of Low-Carbon Conversion Science & Engineering, SARI via video or Teleconference – TBC |
|                  | Discussion session, possible relevant topics:                               |                                 |     |                           | Hydrogen generation and hydrogen import – Cost comparison and competitiveness  
Substitution of H2 from naphta  
Long term pathway to low carbon H2  
Synergies with current infrastructure  
Potential of by-product hydrogen and enhanced values chains |
| 15:30-15:45      | Coffee break                                                                  |                                 |     |                           |                                                                                     |
| 15:45-16:45      | Fuel cell micro CHP in residential applications:                              | Cecilia Tam, Alexander Körner   | IEA | 20min                     | Lessons learned from the micro CHP project in Japan /Yuji Nagata, Director, Chief Technology Executive, Toshiba FCP  
Ulsan hydrogen town /Junbom Kim, Vice President, Korea Hydrogen Industry Association |
|                  | Discussion session, possible relevant topics:                               |                                 |     |                           | FC micro CHP and cost competitiveness  
Natural gas vs. hydrogen infrastructure  
The role of by-product hydrogen  
Distributed heat and power in case of emergencies |
| 16:45-17:15      | Power generator with Hydrogen fuel                                           | Cecilia Tam, Alexander Körner   | IEA | 20min                     | CO2 Free Energy Supply Chain to Japan with Liquid Hydrogen - included Hydrogen power station /Nishimura Motohiko, Senior Manager, Hydrogen Project Department, Corporate Technology Planning Center, Corporate Technology Division, Kawasaki Heavy Industry |
|                  | Discussion session, possible relevant topics:                               |                                 |     |                           | H2 delivery volume and Cost  
Effect of cost reduction |
<table>
<thead>
<tr>
<th>Time</th>
<th>Day one recap and discussion</th>
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<tr>
<td>17:15 – 17:45</td>
<td>Day one recap and discussion</td>
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<td>18:15 – 18:45</td>
<td>Move from Hotel Mt.Fuji to Visitor center</td>
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<td>18:45 – 19:15</td>
<td>Visiting &quot;Fuji visitor center&quot;</td>
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<td>19:15 – 19:30</td>
<td>Move from Visitor center to Highland hotel</td>
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<td>19:30 – 21:00</td>
<td>Welcome reception (Host by Yamanashi prefecture) &quot;Teara&quot; in Highland resort hotel</td>
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<td>21:00 –</td>
<td>Move from Highland hotel to Hotel Mt.Fuji</td>
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**Day 2 - June 27**

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<th>Time</th>
<th>Day 2</th>
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<tr>
<td>9:00-10:00</td>
<td>Industry and policy makers – expectations and requirements:</td>
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<tr>
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<td>Moderator: Cecilia Tam, Alexander Körner/IEA</td>
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<td>Presentations (20min)</td>
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<td>- Lessons learned from early markets:</td>
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<td>1) Battery electric vehicle introduction /Kouji Toyama, Principal, Roland-Berger</td>
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<td>2) Hydrogen Station–related issue for market introduction / NEDO</td>
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<td>Discussion, possible relevant topics:</td>
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<td>- Need for market pull policies</td>
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<td>- The role of long term emission targets</td>
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<td>- The role of regulation/standards for successful H2 technology roll-out</td>
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<td>- Harmonization of safety regulation for hydrogen refuelling stations</td>
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<tr>
<td>10:00– 10:15</td>
<td>Coffee break</td>
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<tr>
<td>10:15 – 11:45</td>
<td>IEA Technology Roadmap on Hydrogen – Preliminary results and discussion of milestones /Alexander Körner, Energy Analyst, Energy Technology Policy Division, IEA</td>
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<tr>
<td>11:45-12:15</td>
<td>Wrap up and next steps</td>
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<tr>
<td>12:15-13:30</td>
<td>Lunch (breakout opportunities)</td>
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<td>Afternoon</td>
<td>Technical tour</td>
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<tr>
<td>13:30-18:00</td>
<td>Yamanashi Factory of Fuji electric corp. Fuel Cell Nanomaterials Center, University of Yamanashi</td>
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<td>18:00</td>
<td>JR Koufu Station</td>
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For further information, please contact:

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