Hydrogen series – Part 1: Green hydrogen: A guide to policy making

TUESDAY, 9 MARCH 2021 • 10:00-10:30 CET
The slides and a recording at https://irena.org/events/2020/Jun/IRENA-Insights & in the handouts section

You are all currently muted and will remain so throughout the webinar
If you have **Questions** to the speaker please use the **Q&A**

Tell us how we did in the **survey** to help us improve

If you encounter any technical issues, please connect via **phone** or contact the **Help Desk**:

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https://support.goto.com/webinar
Green Hydrogen: A guide to policy making
IRENA's work on green hydrogen

Upcoming:

• SECTORIAL POLICY BRIEFS
What is “green” hydrogen?

<table>
<thead>
<tr>
<th>Color</th>
<th>GREY HYDROGEN</th>
<th>BLUE HYDROGEN</th>
<th>GREEN HYDROGEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>SMR or gasification</td>
<td>SMR or gasification with carbon capture (85-95%)</td>
<td>Electrolysis</td>
</tr>
<tr>
<td>Source</td>
<td>Methane or coal</td>
<td>Methane or coal</td>
<td>Renewable electricity</td>
</tr>
</tbody>
</table>

Most abundant chemical structure in the universe.
The “old wave” of hydrogen

Hydrogen policies at a global level by segment of the value chain

15 countries + EU considered
The new wave of **green hydrogen**

- **Commitment to net zero**
- **Decreasing VRE cost**
- **Focus on all sectors**
- **Actor diversity**
- **Technology maturity**

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“Green Hydrogen” indexed research volume on Google
Barriers to the deployment of green hydrogen

- Capital cost
- Electricity cost
- Lack of hydrogen market
- Barriers to power market

- Limited existing infrastructure
- Tolerance of users
- Lack of investment

- High cost
- Lack of demand for green products
- Global competition and carbon leakage

- High cost
- Procurement of sustainable CO₂
- Policy focus on biofuels

- High cost
- Technical barriers on ships and in ports
Barriers to the deployment of green hydrogen - costs

- Electrolyser system cost (USD 770/kW) + fixed costs
- Electrolyser system cost (USD 500/kW) + fixed costs
- Electrolyser system cost (USD 200/kW) + fixed costs
- Electricity price (20 USD/MWh)
- Fossil fuel range

- Electrolyser system cost (200 USD/kW) + fixed costs
- Electricity price: USD 10/MWh
- Electricity price: USD 20/MWh
- Electricity price: USD 40/MWh

Fossil fuel range
Policy pillar 1: National hydrogen strategies

Upcoming Strategies:
- Austria
- Colombia
- Denmark
- Morocco
- Oman
- Paraguay
- United Kingdom
- Uruguay
- and more to come
Policy pillar 2: Policy priorities

- Green hydrogen can be utilised in a wide range of end-uses
- Identify the applications that provide the highest value and prioritise action towards them
- Maintain the principle of additionality
Hydrogen as part of a wider technology portfolio for the Energy Transition

<table>
<thead>
<tr>
<th>RENEWABLES</th>
<th>DIRECT ELECTRIFICATION</th>
<th>ENERGY EFFICIENCY</th>
<th>GREEN HYDROGEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEATING</td>
<td>• Solar water heaters, direct geothermal use, biomass (low-grade heating)</td>
<td>• Heat pumps</td>
<td>• High-grade heating</td>
</tr>
<tr>
<td>INDUSTRY</td>
<td>• Solar drying, biomass (productive uses)</td>
<td>• Electric industrial application (e.g. arc furnaces)</td>
<td>• Steelmaking refineries</td>
</tr>
<tr>
<td>LAND TRANSPORT</td>
<td>• Biofuels</td>
<td>• Battery electric vehicles</td>
<td>Performance standards</td>
</tr>
<tr>
<td>SHIPPING</td>
<td>• Biofuels</td>
<td>• Short-distance shipping</td>
<td>Ship design</td>
</tr>
<tr>
<td>AVIATION</td>
<td>• Biojet fuels</td>
<td>• Short-distance aviation</td>
<td>Plane design</td>
</tr>
</tbody>
</table>
Guarantee of origin schemes should be based on life cycle GHG emissions, from upstream activities such as electricity generation to end uses.
Policy pillar 4: Enabling policies

- Industrial policies
- Finance
- Code and standards
- Consultation process
- Statistics collection
- Level the playing field
- Research priorities

Level the playing field
Next policy briefs
NEXT WEBINAR

❑ 23 MARCH 2021 • 10:00 – 10:30 CET
“Hydrogen series – Part 2: Green Hydrogen Cost Reduction: Scaling up Electrolysers to Meet the 1.5°C Climate Goal”

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