

**CIGRE Study Committee C5**

**PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP**

<b>JWG N° C5/C1.35</b>	<b>Name of Convenor:</b> Tongkum Piyateravong (TH) <b>E-mail address:</b> Tongkum@erc.or.th
<b>Strategic Directions #<sup>2</sup>:</b> 1, 3	<b>Sustainable Development Goal #<sup>3</sup>:</b> 7, 13
<b>The WG applies to distribution networks:</b> <input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	
<b>Potential Benefit of WG work #<sup>4</sup>:</b> 2	
<b>Title of the Group:</b> Integration of hydrogen in electricity markets and sector regulation	
<p><b>Scope, deliverables and proposed time schedule of the WG:</b></p> <p><b>Background:</b></p> <p>The hydrogen certainly plays a role in decarbonising sectors where electrification is challenging including heat, heavy duty transport and industry. However, Integration of hydrogen in electricity networks and natural gas pipeline networks will challenge the whole energy system especially electricity markets in decarbonisation. This because it can involve or interact with:</p> <ul style="list-style-type: none"> <li>• Energy storage,</li> <li>• Power to X, for example: <ul style="list-style-type: none"> <li>○ power-to-gas</li> <li>○ power-to-liquid</li> <li>○ power-to-fuel,</li> <li>○ power-to-chemicals and</li> <li>○ power-to-heat</li> </ul> </li> <li>• Battery Electric Vehicles (BEV) and Fuel Cell Electric Vehicles (FCEV) and</li> <li>• Electrolyser grid connection.</li> </ul> <p>Currently 95% of the hydrogen produced globally is from natural gas and coal gasification (Blue hydrogen). This blue hydrogen will establish the market for hydrogen until green hydrogen (renewable hydrogen) becomes cost competitive in 2030. The regulation, trading systems and market mechanisms must be properly established for this challenge.</p> <p>This working group will gather information about grid connection to hydrogen technology resources and new initiatives for analysing effect on electricity market such as Capacity Market, Day ahead Market as well as market coupling on Commodity market: Natural Gas price in Spot and Forward Market.</p> <p>In addition, this group will gather hydrogen related information and analyse regulation issues in various countries and continents which currently are established or are planned for the future.</p> <p><b>Scope:</b></p> <ol style="list-style-type: none"> <li>1. Obtain information on grid connection to Hydrogen technology resources and new initiatives.</li> <li>2. Evaluate effects on Electricity Markets as well as market coupling on Commodity market: Natural Gas</li> <li>3. Obtain hydrogen related information on regulations in various countries and continentals.</li> <li>4. Analyse market structures and governing agencies — as well as the pricing mechanisms — that play a principal role in the markets.</li> </ol>	

**Deliverables:**

- Technical Brochure and Executive Summary in Electra
- Electra Report  CSE
- Future Connections
- Tutorial  Webinar

**Time Schedule:** start: April 2022

**Final Report:** August 2024

**Approval by Technical Council Chairman:**

Date: February 20, 2022



Notes: <sup>1</sup> Working Group (WG) or Joint WG (JWG), <sup>2</sup> See attached Table 1, <sup>3</sup> See attached Table 2 and CIGRE reference Paper: Sustainability – at the heart of CIGRE's work. <sup>4</sup> See attached Table 3

**Table 1: Strategic directions of the Technical Council**

1	The electrical power system of the future reinforcing the End-to-End nature of CIGRE: respond to speed of changes in the industry by preparing and disseminating state-of-the-art technological advances
2	Making the best use of the existing systems
3	Focus on the environment and sustainability (in case the WG shows a direct contribution to at least one SDG)
4	Preparation of material readable for non-technical audience

**Table 2: Environmental requirements and sustainable development goals**

CIGRE selected the 7 SDGs that are the most relevant to CIGRE. In case the WG work refers to other SDGs or do not address any specific SDG, it will be quoted 0.	
0	Other SDGs or not applied
7	<b>SDG 7: Affordable and clean energy</b> Increase share of renewable energy; e.g. expand infrastructure for supplying sustainable energy services; ensure universal access to affordable, reliable, and modern energy services; energy efficiency; facilitate access to clean energy research and technology
9	<b>SDG 9: Industry, innovation and infrastructure</b> Facilitate sustainable infrastructure development; facilitate technological and technical support
11	<b>SDG 11: Sustainable cities and communities</b> Increase attention on sustainable and resilient buildings utilizing local (raw) materials, power for electric vehicles, strengthening long-line transmission and distribution systems to import necessary power to cities, developing micro-grids to reinforce the sustainable nature of cities; protect and safeguard the world's cultural and natural heritage; reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and waste management
12	<b>SDG 12: Responsible consumption and production</b> E.g. Promote public procurement practices that are sustainable; address reducing use of SF6 and promote alternatives, encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle, address inefficient fossil-fuel subsidies that encourage wasteful consumption
13	<b>SDG 13: Climate action</b> E.g. Increase share of renewable or other CO2-free energy; energy efficiency; expand infrastructure for supplying sustainable energy; strengthen resilience and adaptive capacity to climate-related hazards and natural disasters; integrate climate change measures into national policies, strategies and planning; improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
14	<b>SDG 14: Life below water</b> E.g. Effects of offshore windfarms; effects of submarine cables on sea-life
15	<b>SDG 15: Life on land</b> E.g. Attention for vegetation management; bird collisions; integration of substations and lines into the landscape

**Table 3: Potential benefit of work**

1	Commercial, business, social and economic benefits for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.