

**CIGRE Study Committee C5**
**PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP**

<b>WG 1<sup>o</sup> C5.32</b>	<b>Name of Convenor:</b> Anthony Giacomoni (US) <b>E-mail address:</b> anthony.giacomoni@pjm.com	
<b>Technical Issues #<sup>2</sup>:</b> 5,7,8		<b>Strategic Directions #<sup>3</sup>:</b> 1,2,3
<b>The WG applies to distribution networks<sup>4</sup>:</b> No		
<b>Potential Benefit of WG work #<sup>5</sup>:</b> 1,2,3,4,5,7		
<b>Title of the Group:</b> Carbon Pricing in Wholesale Electricity Markets		
<b>Scope, deliverables and proposed time schedule of the WG:</b> <b>Background:</b> <p>Due to increased concerns over climate change, many countries and jurisdictions around the world are implementing carbon prices in their wholesale electricity markets to limit greenhouse gas emissions. According to the World Bank <i>State and Trends of Carbon Pricing 2019</i> report there are 57 carbon pricing initiatives implemented or scheduled for implementation around the world, which span 46 national jurisdictions and 28 subnational jurisdictions.</p> <p>There are two main types of carbon pricing: emissions trading systems (ETS) and carbon taxes. An ETS, sometimes referred to as a cap-and-trade system, caps the total level of greenhouse gas emissions and allows those emitters with low emissions to sell their extra allowances to larger emitters. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions. Alternatively, a carbon tax directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or, more commonly, on the carbon content of fossil fuels. It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined but the carbon price is.</p> <p>This working group will analyse mechanisms for pricing carbon and other greenhouse gases in wholesale electricity markets. While other studies such as those by the World Bank provide an overview of existing and emerging carbon pricing initiatives, this working group will focus specifically on their impacts on electricity markets. The group will gather information about carbon pricing mechanisms as they exist today and examine if these mechanisms are working as desired. For example, are market participants and regulators supporting the market approach or not and what types or border adjustment mechanisms are being used. The working group will analyse key themes and trends among the various market mechanisms and initiatives.</p> <b>Scope:</b> <ol style="list-style-type: none"> <li>1. Document the existence of carbon prices in wholesale electricity markets.</li> <li>2. Detail the mechanism or process for how the carbon prices are established.</li> <li>3. Evaluate the carbon pricing initiatives currently in implementation.</li> <li>4. Evaluate the costs of the carbon pricing initiatives.</li> <li>5. Examine the benefits/impacts and challenges of the carbon pricing initiatives as they exist today, and explore themes and trends.</li> <li>6. Examine how the effects of other greenhouse gases can be included in carbon pricing initiatives.</li> </ol>		

**Deliverables:**

- Technical Brochure and Executive Summary in Electra
- Electra Report
- Tutorial<sup>6</sup>
- Webinar<sup>6</sup>

**Time Schedule:** start: September 2019

**Final Report:** December 2021

**Approval by Technical Council Chairman:**



**Date:** June 21st, 2019

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, <sup>4</sup> Delete as appropriate, <sup>5</sup> See attached Table 3,  
<sup>6</sup> Presentation of the work done by the WG

**Table 1: Technical Issues for creation of a new WG**

<b>1</b>	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
<b>2</b>	Digitalization of the Electric Power Units (EPU): Real-time data acquisition includes advanced metering, processing large data sets (Big Data), emerging technologies such as Internet of Things (IoT), 3D, virtual and augmented reality, secure and efficient telecommunication network
<b>3</b>	The growth of direct current (DC) and power electronics (PE) at all voltage levels and its impact on power quality, system control, system operation, system security, and standardisation
<b>4</b>	The need for the development and significant installation of energy storage systems, and electric transportation, considering the impact they can have on the power system development, operation and performance
<b>5</b>	New concepts for system operation, control and planning to take account of active customer interactions, and different generation types, and new technology solutions for active and reactive power flow control
<b>6</b>	New concepts for protection to respond to the developing grid and different generation characteristics
<b>7</b>	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
<b>8</b>	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
<b>9</b>	Increase of right of way capacity through the use of overhead, underground and submarine infrastructure, and its consequence on the technical performance and reliability of the network
<b>10</b>	An increasing need for keeping Stakeholders and Regulators aware of the technical and commercial consequences and keeping them engaged during the development of their future network

**Table 2: Strategic directions of the Technical Council**

<b>1</b>	The electrical power system of the future: respond to speed of changes in the industry
<b>2</b>	Making the best use of the existing systems
<b>3</b>	Focus on the environment and sustainability
<b>4</b>	Preparation of material readable for non-technical audience

**Table 3: Potential benefit of work**

<b>1</b>	Commercial, business, social and economic benefits for industry or the community can be identified as a direct result of this work
<b>2</b>	Existing or future high interest in the work from a wide range of stakeholders
<b>3</b>	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
<b>4</b>	State-of-the-art or innovative solutions or new technical directions
<b>5</b>	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
<b>6</b>	Work likely to contribute to improved safety.
<b>7</b>	Work addressing environmental requirements and sustainable development goals.