

**CIGRE Study Committee C4**
**PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP**

<b>WG 1<sup>o</sup> C4.70</b>	<b>Name of Convenor:</b> Joan Montanyà (SPAIN) <b>E-mail address:</b> <a href="mailto:joan.montanya@upc.edu">joan.montanya@upc.edu</a>
<b>Strategic Directions #2: 1</b>	<b>Sustainable Development Goal #3:9</b>
<b>The WG applies to distribution networks:</b> <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	
<b>Potential Benefit of WG work #4 : 3, 4, 5, 6</b>	
<b>Title of the Group: Application of space-based lightning detection in power systems</b>	
<b>Scope, deliverables and proposed time schedule of the WG:</b>  <b>Background:</b> <p>Information about lightning activity and its parameters is necessary to design and evaluate the lightning protection of a power system. Most extended lightning detection networks provide mainly information on cloud-to-ground lightning strikes covering areas up to global scale, whereas high-resolution ground-based total lightning (cloud-to-ground and intracloud) networks are restricted to small regions. In addition, real-time lightning detection makes it possible to provide warnings and actions to ensure safety and power quality. Recently, the first satellite-based lightning optical detectors are operating continuously from geostationary orbits. These imagers observe the luminosity escaping from clouds to detect and locate total lightning activity. This allows to delineate the initiation and propagation (sometimes over tens to hundreds of kilometers before striking the ground) not observable by the ground-based networks. In summary, some of the advantages of detection lightning from space are:</p> <ul style="list-style-type: none"> <li>• Lightning detection in regions not covered or poorly covered by lightning location systems.</li> <li>• More realistic quantification of the total lightning activity over large areas.</li> <li>• More realistic characterization in size and duration of lightning flashes in large areas.</li> <li>• Possibility to identify continuing currents.</li> </ul> <p>The working group will review the current use of ground-based lightning detection networks in power systems and will assess de value of space-based lightning data.</p> <b>Scope:</b> <ol style="list-style-type: none"> <li>1. Review of the use of lightning data provided by ground-based lightning location systems;</li> <li>2. Review the characteristics and performance of the existing and future space-based lightning imagers;</li> <li>3. Provide a list of applications where space-based lightning detection data</li> </ol>	

can contribute;

4. Value assessment of space-based lightning detection data in existing applications;
5. Value assessment of space-based lightning detection data in possible new applications;
6. Provide guidelines for integration and use of space-based lightning data.

**Deliverables:**

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

**Time Schedule:** start: January 2022

**Final Report:** December 2025

**Approval by Technical Council Chairman:**

**Date:** October 6<sup>th</sup>, 2021



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 CO <sub>2</sub> -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**

<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.