CIGRE Study Committee C1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG N° C1.51	**Name of Convenor:** Jeff Palermo (USA)
Strategic Directions #[2]: 1	**Sustainable Development Goal #[3]: 7, 9, 13**
The WG applies to distribution networks: ☒ Yes / ☐ No	
Potential Benefit of WG work #[4]: 1, 2, 3, 4	
Title of the Group: The potential roles of energy storage in electric power systems	

Scope, deliverables, and proposed time schedule of the WG:

This WG aims to quickly establish a reference of state-of-the-art defining the range of possibilities for energy storage in electric power systems. It will deliver a Technical Brochure, Electra article, and tutorial by the 2024 Paris session or 2025 Symposium.

Background:

Successfully decarbonizing the electric power system will need energy storage for a range of roles, in particular short term for grid operation and long term for system balancing. Some roles for storage are clear while others lie in the future.

Purpose/Objective/Benefit of this work:

Initiate CIGRE's specific efforts using and applying energy storage, work that should lead to a line of future Working Group efforts.

Scope:

The working group would investigate and report on:

1. Types of energy storage—electrical, mechanical, chemical.
2. Energy storage uses in time and space—from energy balancing to long-term storage, and mitigating transmission congestion to local storage to reduce losses.
3. Storage already available and under developments, including technologies, expected volumes and costs.
4. Technical functions of energy storage—capacity and energy needs, rapid and slow discharging and charging.
5. Future needs for implementing energy storage—what factors/variables influence the various roles – are there practical scale limitations to particular technologies?
6. Delineating the generation, transmission, distribution, and load management functions of energy storage—the energy storage characteristics that distinguish these two functions.
7. Technical solutions that can reduce the need for storage.
8. Techno-economic benchmark of different storage solutions.
9. Matching storage solutions with system needs/optimal mix.
10. Role of storages in the flexibility mix of future energy systems.

Remarks:

On storage there is no specific CIGRE previous activity, which is the reason to set up this first dedicated WG, which will identify previous or related activity also outside CIGRE.

Deliverables:

☒ Annual Progress and Activity Report to Study Committee
☒ Technical Brochure and Executive Summary in Electra
☐ Electra Report
☐ Future Connections
☐ CIGRE Science & Engineering (CSE) Journal
☒ Tutorial
☒ Webinar

Time Schedule:

- Recruit members (National Committees) Q1 2024
- Develop final work plan Q1 2024
- Draft TB for Study Committee Review Q1 2025
- Final TB Q3 2025
- Tutorial 2025
- Webinar 2026

Approval by Technical Council Chairman:

Date: December 11th, 2023

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

WG Membership: refer Comments at end of document

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	**SDG 7: Affordable and clean energy** 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	**SDG 9: Industry, innovation and infrastructure** Facilitate sustainable infrastructure development; facilitate technological and technical support
11	**SDG 11: Sustainable cities and communities** 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	**SDG 12: Responsible consumption and production** 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	**SDG 13: Climate action** E.g. Increase share of renewable or other CO_2-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	**SDG 14: Life below water** E.g. Effects of offshore windfarms; effects of submarine cables on sea-life
15	**SDG 15: Life on land** 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.

Comments:

1) CIGRE Official Study Committee Rules: WG Membership

https://www.cigre.org/GB/about/official-documents

a. Only one member per country (by exception of SC Chair)

b. WG nominees must first be supported by their National Committee (or local SC Member) as an appropriate representative of their country.

c. Acceptance of the nomination is granted by the SC Chair and advised to the WG Convener

2) Collaboration Space

https://www.cigre.org/article/GB/collaborative-tools-2

CIGRE will provision the WG with a dedicated Knowledge Management System Space.

The WG will use the KMS for drafting collaboration, capture and retention of discussion and meeting records.

Official country WG Members will be sent registration instructions by the Convener.

Official country WG Members may request the WG Convener to allow additional access for an extra national subject matter specialist to aid in the work at the national level, including NGN members.