

## Study Committee C3

POWER SYSTEM ENVIRONMENTAL PERFORMANCE

**Thursday 01/09/2022**

**SUMMARY**

**Chairman:** Mercedes Vázquez (REDEIA-ES)

**Secretary:** Angel Salinas (REDEIA-ES)

**Special Reporters:**

**PS1:** Michele de Nigris Michele (RSE-IT)

**PS2:** Satoshi Nakasono (CRIEPI-JP)

**PS3:** Randy Grass (Powereng-USA)

### 1. INTRODUCTION

The 2022 discussion meeting of Study Committee C3 was held on 1<sup>st</sup> September in room Havane (PS1&PS2) and the Grand Amphitheatre (PS3) at the Palais des Congrès in a full day session. The sessions were mainly face to face. Sparkup used as the tool for local and online interactivity.

The Discussion Group Meeting (DGM) was held for discussing the following three Preferential Subjects:

- PS1: Setting ambitious climate targets in the energy sector.
  - PS2: Biodiversity and the supply of electricity, renewables-based or not: risks, challenge, solutions, and opportunities.
  - PS3: B2&C3: Environmental and Safety Aspects of Overhead Lines.
- 
- PS1: 13 papers, 23 questions. 21 contributions with presentations to 17 questions; 8 questions did not have a written contribution. There was a total of 5 spontaneous contributions with discussions.
  - PS2: 5 papers, 6 questions. 11 contributions with presentations to all the questions (6). There was a total of 4 spontaneous contributions with discussions.
  - PS3: 21 papers (3 for C3), 22 questions divided in three Groups. Group 2 (6 papers-2 of C3) and 3 (9 papers-1 of C3) directly related to C3 (Reduction in environmental impacts from new and existing OHL and Innovative engineering solutions/design to deal with environmental challenges.

- **Young Engineer Presentation:**

A paper each from Ireland (PS1) and Switzerland (PS3) were presented. There were spontaneous contributions for PS1 and PS3 papers through Sparkup.

## **2. RUNNING OF THE MEETING**

The Discussion Group Meeting was chaired by the Study Committee Chairman, *Mercedes Vàsquez*, with *Michele de Nigris (PS1)*, *Satoshi Nakasono (PS2)*, *Randy Grass (PS3)* as Special Reporters and *Angel Salinas* as SC C3 Secretary. Contributions from the audience were also enabled through use of the Sparkup application to allow questions to be asked and responded to on line. The Sparkup application and questions were managed by the SC3 Secretary.

The morning session started with a brief summary by the SC Chair of the scope of the work of SC C3. The chairperson also provided a quick summary of the procedure for running the DGM. The chairperson then introduced the special reporters and the preferential subjects and indicated that the special reporters would provide a brief discussion of each preferential subject prior to the contributor presentations.

The presentation of the NGN paper (PS1 paper: 11153) was carried out in the morning. At the beginning of the PS2 session in the afternoon, an additional presentation dedicated to the Biomimicry methodology was delivered.

## **3. CONTRIBUTIONS TO PREFERENTIAL SUBJECT 1**

Thirteen (13) papers were accepted in response to PS1. The papers originated from eight (8) countries reflecting a wide and international interest in the topics. The papers present concepts and results that broadly align with the three subgroups defined by the SC as follows. 8 questions (out of 21) did not receive answers, mostly because of the absence of the authors of the papers:

The conclusions from the presentation and discussions may be briefly summarized as follows:

- System expansion studies are very complex because they must consider several different aspects at the same time.
- Developments in studies and application of biomimicry addressed in the session include surface structuring, material composition/architecture and product design approach at the early stage of the process.
- Re-purposing and rehabilitation of degraded sites to positively contribute to the energy transition. Most issues encountered were the problems related to the permitting procedures. Metrics such as electricity production (in GWh), saved emissions of CO<sub>2</sub> and other pollutants can be used to measure success of the project.
- The reduction of the carbon footprint of the operations linked with the transport of electricity at the light of the experience of three major network operators from France, Italy and Spain was a subject of open discussion. Activity is also ongoing to integrate eco-design into the operator's Environmental Management System (EMS), carrying out various generic Life Cycle Analyses (LCAs) to assess the environmental footprint of the structural elements of tomorrow's network in order to improve decision-making and identify eco-design options.
- Regulations and directives are already in place to prevent the use or the dispersion of Substances of Very High Concerns (RoHS, WEEE, Reach, ...).
- The engagement of local communities in all phases of the development of the energy system is key to ensure the protection of potentially vulnerable populations (such as the indigenous population) which may be heavily affected by non-adequate planning of system development and operation, especially when exposed to climate change issues.
- The development and operation of energy systems can generate unfair situations in occasion of crisis situations when alternative decision making is required. Implementing fairness norms can be facilitated by designating a legitimate authority responsible for pursuing action and designing an allocation authority responsible for investigating heterogeneous values.

#### **4. CONTRIBUTIONS TO PREFERENTIAL SUBJECT 2**

The theme for Preferential Subject 2 (PS2) is “Biodiversity and the supply of electricity, renewables-based or not: risks, challenges, solutions and opportunities”.

These papers were submitted from highly diversity of the regions on the planet, such as Europe, Africa, South America and, Southeast and Far East Asia. The infrastructures include submarine cables, overhead power lines, thermal power plants, solar power plants, hydroelectric power plants, and their ecosystems range from freshwater, marine or terrestrial.

Different regions have different issues about biodiversity in each infrastructure that need to be retained, and different ways of dealing with them.

By sharing their respective cases, we discuss effective and efficient biodiversity conservation methodologies, regulations, and communication.

#### **5. CONTRIBUTIONS TO PREFERENTIAL SUBJECT 3**

Environmental and safety aspects regarding OHL are more and more known, evaluated, sensitive and taken into account during the design, construction, and operation phases. Such aspects are finding better ways to protect line workers during installation and maintenance, limiting visual impact and improving social acceptance (tower, painting, procedures...). It may also include utilizing new and innovative technologies to monitor or limit such things as EMF, audible noise, line insulation, hardware condition, optimize towers and conductor configurations, and also development of methods, tools to assess impacts and to simulate, test in laboratory or in the field.

We had good discussion for each of the three groups. The conclusions from the presentation and discussions may be briefly summarized as follows. Group 1 discussion was focused mostly on the safety of line workers with focus on worker health and safety equipment and new sensor technology to further improve safety. Group 2 discussion was focused on reducing environmental impacts including reduction in CO<sub>2</sub> for various design and construction options and several topics around bird flight diverters. Group 3 discussion issues regarding the wildfire detection system using artificial intelligence and innovative temporary access roads

#### **6. CONCLUSION**

Throughout the document, the conclusions of the GDM have been pointed out.

All the contributions, including spontaneous contributions and suggestions, provided many interesting ideas and useful discussions.