CIGRE Study Committee C3

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG [1]N° C3.23	Name of Convenor: Busato Guillaume (FRANCE)
Technical Issues #[2]: 7	Strategic Directions #[3]: 3
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[5]: 7	
Title of the Group: Eco-design methods for TSOs/DSOs under environmental transition	

Scope, deliverables and proposed time schedule of the WG:

Definition

Ecodesign (European Commission, 2012)

Ecodesign implies taking into account all the environmental impacts of a product right from the earliest stage of design. In particular, this avoids uncoordinated product planning (for example, eliminating a toxic substance should not lead to higher energy consumption, which on balance could have a negative impact on the environment).

Background:

Energy transition is a key subpart part of environmental transition.

Full and deep implementation of a systemic eco-design approach will be a key success factor to achieve our sustainable goals. It will rely on several steps :

- rationally assess an extensive set of positive and negative environmental impacts, over the project life cycle in order to prevent the transfer or accumulation of impacts
- Identify the key axis for improvement
- Design and implement the most sustainable solutions.

Since the scientific evidence indicates that the planet is likely to exceed environmental limits faster than ever (biodiversity loss, climate change, resource depletion,…) the need for eco-design methodology becomes more urgent and significant.
This eco-design development has already proven to be beneficial for technological innovation and economic improvements.

However, systemic eco-design is not mature yet and does not always match TSO/DSO needs.
There are several reasons for this:

- The global environmental challenges require a systemic approach and therefore needs a much larger view and co-operation of all supply chain actors, more than ever. One of the key factors of success would be to be able to identify and to collectively focus on the most relevant impacts for TSOs and DSOs.
- Eco-design is a relatively young science, including eco-design tools (Life Cycle Analysis, Material Flow Analysis, …). There is for example a big need for reliability improvements of characterisation factors in LCA (Life Cycle Analysis).
- There is a very high level of uncertainties regarding what the electricity system will look like in the next decades. Optimal eco-design will therefore need to explore new constraints and methodologies. Biomimicry could be one of them, such as a higher degree of infrastructure adaptation to be able to match constantly changing electricity pathways.

- Specific and efficient solutions must be based on precise, detailed and specific data. Therefore the quality and consistency of existing environmental database (EcoInvent, Gabi, EIME, OpenLCA,…) must be adapted, developed and harmonised to match TSOs/DSOs' specific needs in characterising equipment and system Life Cycle Inventories (LCI)

Since this is a systemic approach, this Working Group will rely on experts which are familiar with systemic approach and, when necessary, will be in contact with other working groups to ask for information related to their specific topics and LCA.

Scope:

In order to activate and harmonize all the eco-design potential for TSOs/DSOs environmental impact reduction, the working group will :

1. Share, benchmark and summarise the actual eco-design methodologies that TSOs/DSOs have or are about to implement. Such a review should focus on the systemic aspect of the electric system.
2. Identify and define which are the most relevant environmental aspects that TSOs/DSOs should prioritise through their systemic Eco-design strategies
3. Specify the best way to collect and share the environmental data between TSO/DSO. It could include the definition of the mandatory data for eco-design, the most appropriate format standardisation to allow information exchange.
4. Review the current different methodologies for systemic environmental impact assessments such as EIAs, SEAs, LCAs, MFAs, CBAs, dynamic prospective models,… and figure out what are the most relevant ones and how to improve them to match TSO/DSO eco design needs.
5. Review the current different methodologies for equipment and system eco-designed specifications of TSOs/DSOs. It could include Biomimicry, UXDesign, circular economy, industrial and territorial ecology…
6. Define the best ways to include and assess eco-design requirements in purchasing strategies and contracts of TSOs/DSOs.
7. Review of current scientific development and trends in systemic eco-design applicable to the electricity industry;
8. Define a guideline for public engagement in eco-friendly design and execution

Key topics for the TB

- Identification and prioritization of the most relevant environmental hot spots for TSOs/DSOs
- State of the art of eco-design methodologies applicable to TSOs/DSOs system specifications and recommendations to improve it.
- State of the art environmental data management and sharing solutions for TSOs/DSOs and recommendations to improve it.
- State of the art of environmental impact assessment methodologies applicable to TSOs/DSOs and recommendations to improve it. The methodologies will include the available LCA tools and database.
- Best practices to implement systemic eco-design requirements and quality insurance in purchasing strategies and contracts and recommendations to improve it.

Deliverables:

☒ Technical Brochure and Executive Summary in Electra

☒ Electra Report

☒ Tutorial[6]

☐ Webinar[6]

Time Schedule: start: Jan 2020 **Final Report**: December 2021

Approval by Technical Council Chairman:

Date: September 25th, 2019

Notes: [1] Working Group (WG) or Joint WG (JWG), [2] See attached Table 1, [3] See attached Table 2, [4] Delete as appropriate, [5] See attached Table 3,
[6] Presentation of the work done by the WG

Table 1: Technical Issues for creation of a new WG

1	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
2	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
3	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
4	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
5	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
6	New concepts for protection to respond to the developing grid and different generation characteristics
7	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
9	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
10	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

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

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.
7	Work addressing environmental requirements and sustainable development goals.