NAME : Edit BERCZI
COUNTRY : Switzerland
REGISTRATION NUMBER: DLG6594

GROUP REF. : B1
PREF. SUBJECT : PS3
QUESTION N° : Q3

The question raised by the special reporter asks about the changes required in cable design, installation practices and end-of-life strategies to improve the recyclability and mitigate the environmental impact and carbon neutrality for cable system.

This contribution would like to address the need to have a holistic approach to evaluate sustainable solutions and to have a common metric to measure their impact. Optimization and use of metric in silos in a system's lifetime may not lead to the overall optimal solution.

As described in the Special report, optimization of power cable design along the entire value chain from raw material solutions to grid operation and maintenance is needed, including cross-industry, value chain collaboration.
The environmental impact of a cable system includes the raw materials used for production of the cable system elements (such as cable, joints, termination, etc..), the production process, transportation, installation, the operation/use of the system and lastly the end-of-life. The environmental impact is generated/owned by different entities for these elements, starting with the raw material supplier, then cable manufacturer, installer, the system operator for the use phase and finally the asset owner for the end-of-life. Some of these elements are one-off, since once the cable is produced, transported, and installed there are no further CO_2 emissions. These values can be considered once, at a constant value. On the other hand, the use of the system generates emissions throughout the lifetime due to losses and this emission is changing in time. Thanks to the integration of renewable energy to the grid and increased efficiency, the emissions associated to the losses are likely to decrease over time.

The complexity of the system emissions clearly shows that a holistic approach is needed, as suggested by others as well, with value chain collaboration.
It is also important to have a harmonized approach and to measure the impact of sustainable solution. For this purpose, a common metric is proposed, that considers the entire lifetime of the cable system, such as **kg CO_2/kW/lifetime**.

For raw materials kg CO_2/kg material is commonly used, that can be included in the emissions of the cable (among the production phase, transportation, installation, and end-of-life) in kg CO_2/km cables. Cable production process improvements, use of recycled materials, or materials produced with renewable feedstock could be captured in this way as well. To include the operation phase, kW/km cable can be considered, which leads to kg CO_2/kW. Cables operate for long periods, to include the longevity, we arrive to kg CO2/kW/lifetime.

If the cost of carbon-dioxide can be defined, it would be also possible to calculate the cost of total emissions of a cable system. This could be included in the total cost of ownership (TCO) together with the capitalized losses.