



PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

<b>WG* N° B2.60</b>	<b>Name of Convenor : Hugo Valente (PORTUGAL)</b>	
<b>Technical Issues # (2): 7</b>		<b>Strategic Directions # (3): 3</b>
<b>The WG applies to distribution networks: No</b>		
<b>Title of the Group: Affordable Overhead Transmission Lines for Sub-Saharan Countries</b>		
<p><b>Scope, deliverables and proposed time schedule of the Group :</b></p> <p><b>Background :</b></p> <p><i>“The absence of modern infrastructure is a major obstacle to ending poverty in developing countries. More than \$800 billion is invested in infrastructure in these countries every year, but that’s less than half of what is necessary. Just achieving universal access to electricity would require an additional annual investment of \$38 billion globally.”</i></p> <p><i>“Only one-fourth of the continent’s [Africa] population has access to electricity, and only about 60 percent has access to clean water.”</i></p> <p>Source: IFC - International Finance Corporation (World Bank Group)</p> <p>Infrastructures are vital in every country. It’s almost unbearable to live in countries where someone needs to walk for kilometers just to get drinkable water. It’s almost impossible to control diseases in places where there are no sewage systems. It’s a utopia referring to industrial activities in countries without a basic energy grid.</p> <p>But these infrastructures are capital intensive and, in what concerns the energy grid, sometimes require specialized manpower, all of which can’t be found in developing countries. So energy infrastructures projects, in particular the ones related to the transmission grid, are developed mainly through turn-key projects, financed by international organizations. And because many of these developing countries don’t have national standards, infrastructure design follows international standards, leading to, sometimes, more expensive infrastructures and somewhat out of the local context.</p> <p>This work will explore the possibility to optimize Overhead Transmission Lines, with specific emphasis for Sub-Saharan Countries, in terms of cost and reliability.</p> <p><b>Scope :</b></p> <p>The focus of this work is to:</p> <ol style="list-style-type: none"> <li>1 Select countries, of the Sub-Saharan region, that for their characteristics (number of financed projects, specific weather conditions, existing infrastructure) could be taken as representative;</li> <li>2 For these sample countries, identify the typical cost structure of Overhead Transmission Lines (OHL), throughout the analysis of different projects;</li> <li>3 Use this cost structure to identify specific potential improvement areas, from design to construction and right-of-way (ROW) establishment;</li> <li>4 Study solutions to optimize cost of the areas mentioned on 3. In the particular case of OHL structures a possibility would be: <ul style="list-style-type: none"> <li>○ Adapt the European Standard EN50341 for these countries, creating something like Regional Normative Aspects (RNA), with adjusted weather variables, safety factors and the resulting load cases;</li> <li>○ Review of how to ensure better meteorological/weather data for use in loading and overall design standards;</li> <li>○ Evaluate this adapted standard and compare the design outcome solutions with the ones from another standard (European or American), in terms of cost, reliability and construction times;</li> </ul> </li> </ol>		

- 5 Make recommendations on a set of standards for use by African utilities to enable them to engage meaningfully with proposed funders/international agencies;
- 6 Make recommendations regarding the use of standardized materials (conductors, fittings and insulators), simplified erection methods and foundation design, among other issues namely the ROW establishment;
- 7 Life cycle assessment of the proposed solutions.
- 8 Make recommendations regarding the possible applicability of the findings to other geographic regions.

**Deliverables :** TB and related Electra paper

**Time Schedule : Start :** April 2015

**Final report :** December 2019

**Comments from Chairmen of SCs concerned :**

**Approval by Technical Committee Chairman :**

**Date :** 04/03/2015



- (1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2  
(4) Delete as appropriate

**Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)**

<b>1</b>	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
<b>2</b>	The application of advanced metering and resulting massive need for exchange of information.
<b>3</b>	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
<b>4</b>	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
<b>5</b>	New concepts for system operation and control to take account of active customer interactions and different generation types.
<b>6</b>	New concepts for protection to respond to the developing grid and different characteristics of generation.
<b>7</b>	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
<b>8</b>	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
<b>9</b>	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
<b>10</b>	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

**Table 2: Strategic directions of the TC (cf. Electra 249 April 2010)**

<b>1</b>	The electrical power system of the future
<b>2</b>	Making the best use of the existing system
<b>3</b>	Focus on the environment and sustainability
<b>4</b>	Preparation of material readable for non technical audience