CIGRE Study Committee C1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG N° C1.33	**Name of Convenor: ANTONIO ILICETO (Italy)** **E-mail address: antonio.iliceto@terna.it**
Technical Issues (1): #7 #10	**Strategic Directions (2): #1 #4**
The WG applies to distribution networks: Y/N YES	
Title of the Group: **Interface & Allocation Issues in multi-party and/or cross-jurisdiction power infrastructures projects**	

Background:

The increasing need for cross-border links and cross-sector (e.g. transmission-distribution) planning, as well as the growing diversification of relevant regulatory & market arrangements, call for deeper consideration of the evaluation principles and allocation criteria for costs, benefits and related risks on both sides of the link.

For the underlying business models, there is no specific rule or consolidated practice when the complexity of the implementation scheme transcends the traditional grid operator/ public-asset-based approach, envisaging a territorial splitting between jurisdictions of investment costs and fifty-fifty splitting of benefits.

These concepts apply in a horizontal dimension (TSO-TSO projects) and also in a vertical dimension (integration between TSO, distributors and other grid operators).

Cross-border lines, spanning more than one country and, therefore, to be scrutinized by at least two regulators and/or supranational legislation, necessarily require cooperation between foreign entities (TSOs, regulators, other decision-making bodies for capacity allocation); in Europe and elsewhere, the "merchant lines" discipline is applicable for fully private investments, but is certainly not exhaustive, especially when a mixed approach to private-public-partnership or multi-party links are considered. The intrinsic flexibility of the merchant line mechanisms and the possibility of asymmetric cost/benefit sharing between investors in interconnection projects gives rise to innovative and case-tailored implementation schemes, and some existing projects already present innovative examples of "business models".

There are fewer examples of coordinated planning between transmission and distribution companies, however, and the growing role of storage needs to be considered properly.

These phenomena have triggered, on one hand, the necessity for TSOs to develop more sophisticated instruments for network planning and prioritizing, based on more rigorous economic analysis, and, on the other hand, the quest for new investment models, with a business-oriented approach typical of the private sector. In particular, where the cost-benefit analysis shows an asymmetry of advantages for the involved parties, this also calls for asymmetric burden sharing.

The key determining characteristics which shape the business models are: nature of investors; prevailing direction of energy flows and related benefitting actors; capital intensity; geographical and topographical distribution of the assets (in particular, when transit territories or international waters are involved); technology - HVDC and/or submarine cables necessarily imply a unitary approach for the whole link regarding design, engineering, procurement and construction).

While costs (capex and opex) are indisputably quantifiable, the assessment of benefits differs very much according to the point of view and the subject under consideration: investing company (looking for profitability), TSO (looking for system performance), electric system as a whole (with possible external factors), end-consumers (looking for energy price reductions), and transmission tariff payers. This adds up to the already challenging and controversial exercise of benefits evaluation, since operational issues (like security of supply/system stability) and social issues (like social acceptance/environmental impact) are difficult to quantify and have no uniform metric.

Scope:

The investigated dimensions for a new planned cross-jurisdiction project will be:
- Allocation of cost / benefit / risk between countries and between grid operators
- Allocation of asset ownership & responsibilities
- Authorization / permitting of the same project in several jurisdictions
- Legislation / regulation traps & gaps (for example EU/non-EU links)
- Regulation and tariff applied on assets outside own jurisdiction
- Investment schemes (public, private, mixed) and relevant governance (e.g. delivery company, etc.)
- Business models set-up for economic feasibility and financial viability.

This will be done in a structured way in order to:
- Identify the challenges (in particular non-technical) for cross-jurisdiction projects;
- Assess the different economic drivers for the different cases;
- Explore advantages and disadvantages of the options for implementation schemes of multi-party projects;
- Map the different possible business models, also considering asymmetric and unilateral investment schemes (for public lines), and the conditions imposed on Third Party Access exemptions (for merchant lines);
- Study the interface issues and applicable business models for coordinated grid planning with neighbouring networks (distributors, active consumer grids, storage devices);
- Try to extend the analysis from single lines to portion of grids (e.g. off-shore grids).

For the above topics, a survey of existing cases (being delivered or at the feasibility stage) shall be done, analyzing the drivers, rationale and criteria for the selected business model for the different stakeholders, with scope to infer some general principles as useful guidelines for the design of future projects. Innovative models, aimed at maximizing social welfare/stakeholder satisfaction, shall also be proposed.

The WG will utilize, as far as possible, results, findings and recommendations from WG C1.22. It will also act under the framework of the new C1 "transversal" Advisory Group and will liaise with JWG C1.29 (with CIRED) as well as with SC C5 and SC B4 (preferential subject PS1, Paris 2016).

Contributions will be invited from C6 on TSO-DSO interface and allocation issues in grid planning and in governing relevant projects.

Deliverables: Report to be published in Electra or technical brochure with summary in Electra

Time Schedule:

Start: March 2015, Conclusions: August 2016 (to be presented in Paris)

Final report: October 2016

Comments from Chairmen of SCs concerned:

Approval by Technical Committee Chairman: M. Wald

Date: 23/04/2015

(1) See attached table 1 – (2) See attached table 2

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

1	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
2	The application of advanced metering and resulting massive need for exchange of information.
3	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.
4	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.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	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.
10	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)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Interactive communication with the public and with political decision maker