

Report Summary

The Florence School of Regulation (FSR) has been asked to conduct an independent review of the current state of development and to define a sound, transparent, cost-reflective and non-discriminatory method for the inter-TSO compensation mechanism which should promote the further development of the Internal EU Electricity Market. This method should replace transitional mechanisms for cost allocations and compensations between TSO's due to cross border electricity flows. The FSR assembled a small independent expert group, chaired by Jacques de Jong (Clingendael International Energy Programme, The Hague) and including Ignacio Pérez Arriaga and Luis Olmos (Comillas University, Madrid) and Richard Green (Birmingham University).

The Report focuses on the methodological approach to inter-TSO compensation (ITC). It also contains a numerical exemplification of the proposed methodology. The methodological assessment covers both the evaluation and the allocation of network costs. Different approaches for each of these aspects are considered and assessed with respect to a set of specific criteria, covering *cost-reflectiveness & coverage, network cost evaluation, consistency with transmission regulation, suitability for the European network, technical soundness, implementation and transparency*. ITC mechanisms should provide compensation for the costs incurred for hosting *all cross-border flows*, and not just transits. In addition a *definition of the Horizontal Network (HN)* was proposed, largely based on the one currently employed by ETSO in the transitional ITC mechanism.

As regards network cost evaluation, the concept of *forward-looking, long-run average incremental cost* is to be applied, be it at the level of the individual network components and for cost calculations to be based on a relatively short list of standardised components. Average operating conditions should be used as a basis, whereas peak-loading characteristics should be taken into account. Standard procedures are required for calculating capital costs and the cost of operation and maintenance, including an assumption about their relative weights in regulated revenues. Standardised costs for different types of HN elements should be used, avoiding distortions, perverse incentives and administrative cost burdens when different TSO cost levels are applied. These standard costs should only be used in the context of the ITC scheme. Topographical differences should be taken into account with typical standardised cost figures. The costs of losses are calculated by valuing the actual losses at the hourly prices on national electricity markets.

A number of alternative *approaches for network cost allocation* have been considered in the recent debate on ITC. These approaches are described and compared, classified into two categories, according to whether they identify responsibility for network costs of individual agents, or assess the overall responsibility of all external agents. These approaches are shown in the following table.

Network cost allocation level	Nature of flows for which compensation is provided	
	Transits	Cross-border flows
Individual agent/node	-	AP, SAP, MAP, MP, AS
External agents	WWT, ETSO, APT	WW

On the basis of a detailed assessment, the *AP method* is recommended as the best available method, since it combines many of the characteristics considered desirable. In particular, it provides compensation with respect to all cross-border flows, allows responsibilities to be defined at the individual agent/node level, produces results which are independent of the location of political borders, and therefore is fully consistent with the 'single system paradigm', provides a coherent framework for defining entitlements and responsibilities for compensation, and does not involve the creation of fictitious scenarios which may be characterised by power flows that have little to do with the physical reality of the actual power system. It finally does not create particular problems when implemented in the highly-meshed European network and is transparent and easy to verify. The main

drawback of the AP method is the need for extensive data (as for some other methods). This is not, however, a particularly serious problem given that meaningful results can be obtained by restricting the analysis to a number of representative snapshots.

A numerical implementation has been made, using flow data for 72 scenarios, provided by ETSO. The AP method is applied, using the standardised cost figures as developed. Two cases are presented for the AP method, one where only the cost of the used fraction of each line is allocated, with a reliability margin of 30% of the thermal capacity, and one where the whole cost of each line used is allocated. Total amounts of net payments then vary between M€ 34,5 and M€ 104,2 respectively. This latter case can also be compared with the present ETSO mechanism, using the same data. The relevant amount is then M€ 266,3. Further discussing the comparisons, it is to be noted that Italy and France are always the main net payers, whereas Switzerland and Austria the main net recipients. Country payments under AP are largely restricted to neighbouring countries, whereas the ETSO mechanism requires almost every country to pay to almost all others. It should be stressed, however, that the only purpose of presenting numerical results is to demonstrate the possibility of effectively computing inter TSO-payments under the preferred methodology.

Discussions on ITC mechanism have been on the agenda since 1998 and have a largely symbolic value. The objective is to find an equitable and simple ITC mechanism, but to date all discussion and analysis have demonstrated that completely objective methodologies on flow calculations and on cost attribution have not yet been found, and arguably never will be. In the view of the authors, the AP method is however the best available, and produces reasonable and economically meaningful results in the liberalised internal European electricity market with its highly meshed, multi-TSO operated electricity network. We trust that the proposals in this study may contribute to a timely conclusion of the protracted and time-consuming decision-making process.