

Distributed generation exemption from network tariffs: general implications and analysis of a case study

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Abstract— All over the world, the increasing amount of distributed generation (DG) connected to distribution grids is posing a wide range of technical and regulatory challenges to the distribution sector. Among them, new costs and benefits due to DG integration need to be re-distributed among network users by means of grid tariffs. However, in most of EU countries, DG is still exempt from paying network tariffs at all; this is likely to translate in an increase of network costs for other customers, in the form of cross-subsidies among network users' categories. With this respect, Sweden represents an interesting study case: on the one hand, each network company is allowed to design its own distribution tariffs; on the other hand, Swedish electricity regulation prescribes partial exemption from distribution network tariffs for DG with installed capacity below or equal to 1500 kW. What are the implications of such a rule? Are consumers and bigger producers paying for higher network charges as a consequence of it?

Along with a review of the general issues related to tariff design and DG, this paper attempts to answer the formulated questions through a numerical estimation of the cross subsidies generated by the existence of the “1500 kW rule”.

Results show the existence of significant cross subsidies between customers' categories, which are likely to gain in importance with future increase of DG integration.

Keywords— Network tariffs, distributed generation, cost allocation, cross subsidies.

1. OVERVIEW

In most of EU Member States, an increasing amount of distributed generation (DG) [1] is being integrated in distribution grids since the last few years, mainly due to the EU energy targets, first of all the so-called “2020” targets [2].

While, from a technical standpoint, DG is likely to affect the network planning and operation [3], from an economic point of view it may cause an increase or decrease in network costs than in an “only-loads” network scenario [4]. Therefore, both a *sound economic regulation of Distribution System Operators (DSOs)*, providing them with the right incentives for efficient investments and grid operation and, at the same time, ensuring them full cost recovery and a fair rate of return, and a *correct network pricing through grid tariffs*, so to ensure a fair cost allocation to the grid users, are increasingly needed. This paper focuses on the latter.

Distribution tariff design consists, at a first stage, in determining the total allowed revenue for each distribution company and, at a second stage, in allocating such amount to network users, i.e. in deciding the tariff structure to be adopted [5].

A preliminary distinction is needed between the distribution tariff, also named as Distribution Use of System (DUoS) charge, and the so-called connection charge: while the former is periodically paid by grid users