Electricity Market Integration under restriction on efficient technologies development: the absence of benefit for electricity consumers

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Electricity market integration is supposed to be beneficial to all the economies as it will be for any other good markets. Lower marginal costs productions in some countries will be used for selling in their countries as well as in the neighbour countries. The price on the integrated markets will be established between the lowest price and the highest prices on he respective markets when they were not integrated. It will be to the benefits of the countries of the high cost producers and for the profitability of the lower cost producers of the other countries. Conversely it will be to the detriment of the countries with low cost producers.

In the longer run, according to the standard economic paradigm, the comparative advantage of the low-cost producers should lead to an increase in low-cost capacities. Prices would adjust to the level of low-cost producers and capacities would migrate from high-cost producers to low-cost producers. And if high cost producers are able to use the technologies used by the low cost producers, they would react by developing also these technologies and contribute to the lowering of hourly electricity prices.

The problem is that this scheme is purely theoretical. It ignores the reasons for which producers have low marginal costs production in some countries and less in other countries at the moment of the regulatory shock of liberalisation. It does not dissociate production by existing and out-written equipments from production with new equipments, to qualify the efficient productions. And finally it supposes that development of all technologies is free and unconstrained at all.

The paper analyse the consequences of market integration in situation of restricted development of efficient technologies, in particular the low variable cost technologies such as hydraulic and nuclear. Low-cost production possibilities are scarce due to political and social restrictions and in the hydraulic cases to limitations of resources. Scarcity rent is generated by the way price is set on the integrated markets: marginal capacities in would set the price in the market The scarcity rent going to the low cost generation units established well before does not be used to invest in new units, contrarily to the hypothesis of the theory. Consequently the price increase in the country with low costs producers which results from the market integration will not help the purpose aimed by the market integration for all the consumers, i.e. price decrease in all the integrated markets. In particular the consumers in the countries with low cost production will never benefit from the low level of price that they benefited before markets integration if interconnections develop, or when they bought their electricity to regulated monopoly with tariffs aligned on cost price.

As the windfall profit of the producers owning nuclear and hydraulic assets at the moment of the liberalisation could not be used for investment in efficient generation technologies, market integration does not allow an efficient reallocation of production under these restrictions on capacity development, and create a redistributive problem from local consumers to local producers. It is socially legitimate to envisage a reallocation of the scarcity rent from these producers to the first consumers.

The paper will consider two situations: the case of newly integrated markets with few limitations to exchanges on the so-called continental market in Europe with French and other nuclear plants owners benefiting of a large scarcity rents, and the case of Scandinavian markets to be integrated in the future to German and Dutch markets by new physical links.

The paper discusses the rationale of market integration by market liberalisation on the ground of the consumers interests. It presents a method to calculate the scarcity rent of the nuclear and hydro equipments existing at the moment of the markets integration. Finally it discusses different possibilities to reallocate a part of the scarcity rent to the local consumers in countries where nuclear and hydro assets.

Curriculum vitae

Dr. Dominique Finon, Senior Fellow in Economics, CNRS, France. Former head of the Institute of Energy Economics (CNRS) in Grenoble University from 1990 to 2002, he is presently member of the CIRED (Center of Research on Environment and Development) of the School of Social Sciences (EHESS) in Paris.

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His main research fields are the efficiency of the market reforms in the electricity and gas industries and the design of public policies in the new market environment (promotion of renewables, energy efficiency, CO2). His former researches dealt with technological policies, political economy of nuclear energy (in particular on the comparison of the Fast Breeder Programs) and energy modelling (He developed the partial equilibrium model EFOM used by the European Commission from 1980 to 2000).

He has published numerous academic and professional papers on and co-edited several books (The most recent: *Reshaping European Gas and Electricity Industries : regulation, Markets and Business Strategies*, London: Elsevier, 2004, with Atle Midttun,. and *Competition in European Electricity Markets : a cross-country comparison*. Cheltenham: Edward Elgar, 2002 with Jean-Michel Glachant.). He is the present chair of the French Association of Energy Economists.

Dr. Elliot Romano, Associate researcher to CIRED and LARSEN. He has a Ph. D.degree from the Lausanne University (1999) with a dissertation on competition policies. He was assistant professor up to 2003 in this University and then economist engineer in EDF R&D division from

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