Viewpoint

An ambiguous relationship between liberalization and innovation?

Liberalization of the energy market, and the development of new energy technologies are opening up a new area for intervention of other operators, aside from the historic protagonists, in conditions considered, in this paper, by senior executives from Suez–Tractebel (Suez Group).

What will the consequences be, of the liberalization of energy markets, on technological innovation in that sector? One should doubtless make the point, first of all, that it was a technological innovation, namely the development of gas turbines, that originally gave rise, in part, to liberalization itself, or at any rate made it feasible, by narrowing down economies of scale in the generation sector.

Second, it is clear that market liberalization calls for better mastery of costs, and, hence, larger gains in productivity. Indeed, in the transportation or communications sectors, developments conforming to such patterns could be observed, following the opening of these sectors to competition.

Rolls-Royce

Industrial gas turbine, derived from the Trent aircraft-propulsion turbofan. Development of gas turbines made liberalization of the energy market feasible, by narrowing down economies of scale in the generation sector.

However, the relationship between competition and innovation is more complex than is immediately apparent. Two opposing forces are at work. On the one hand, pressure of competition compels firms to constant innovation, if they are to survive. However, on the other hand, competition may lower the returns from innovation, and may also narrow down the timeframe considered for investment decisions. The issue of the connection between competition and innovation may thus not be resolved altogether, in *a priori* fashion, on a purely theoretical level.

How do matters stand, then, from an empirical standpoint? Overall, competition and innovation appear to be positively correlated. However, the relation would appear not to be linear, the ideal in this respect being real, though not "excessive" competition. [1] Standing somewhere in between the "slumbering monopoly" and the atomized firm of perfect competition, the best innovator would thus be the business in an oligopoly position, or engaging in "monopolistic competition."

It's Kyoto, stupid!

It is likely that liberalization of the energy markets will result in a nonhomogeneous effect on technological innovation, depending on the latter's nature.

Incremental innovations resulting in improved mastery of costs, or enhanced consumer satisfaction, should in effect be bolstered. One may, in this respect, point to the constant improvement in gas-turbine performance, or online billing, or to innovations that should lead, in the longer terms, to improved demand reactivity to energy prices...

For the public at large, however, technological innovation in the energy sector means, first and foremost, "new energies": wind power, solar power, fuel cells... Now, in this respect, one needs must point out that the decisive factor is not market opening, but very much Kyoto. Indeed, it is our obligations – albeit potential obligations, at present – under the aegis of the Kyoto Protocol that will impel the acceleration of technological developments which, without the Protocol (and regardless of the regulation system in force for the sector), would have been much more protracted.

The issue that arises, with respect to these innovations, is that of the interaction between liberalization of energy markets and implementation of the Kyoto Protocol.

In this respect, the recent European Directive providing for the setting up, by January 2005, of a scheme for the restriction of, and trading in, greenhouse gas emission rights is further evidence of the European Union's salutary wish to rely broadly on market mechanisms, in the Kyoto context.

Does this mean that all is for the best in the best of all worlds? Unfortunately not! Indeed, one finds that liberalized energy markets, in particular electricity markets, show great difficulty in achieving "time depth." More worrying, "futures" markets have recently contracted in the United States. This phenomenon reflects the huge uncertainty still prevailing with regard to the satisfactory operation, and final configuration, of electricity markets opened to competition.

It would be reckless to imagine the issue is a transient one, due to disappear of its own accord, after a learning phase. In this respect, one may note, paradoxically, that Europe would seem still to be banking on natural self-regulation of the market, even as the United States has stopped believing in it! [2]

Resolving uncertainties

The European energy sector stands at the crossroads. A honeymoon period is coming to an end, in which governments could reap the benefits of opening without needing to be unduly concerned by a range of pending issues. Nowadays, the issue has ceased being that of deciding how what some deem to be the "flab" inherited from the past era is to be shared out, rather it is how should security of supply be ensured, excessive market volatility be prevented, how to manage the expected rise in prices, and bring investors to build the infrastructures and carry through the innovations required for the curbing of CO_2 emissions, and the proper operation of markets.

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(1) See P. Aghion, N. Bloom, R. Blundell, R. Griffith, and P. Howitt, *Competition and Innovation: An Inverted-U Relationship*, Institute for Fiscal Studies, Working Paper 02/04, 2002: http://www.ifs.org.uk/wps/wp0204.pdf

(2) Federal Energy Regulatory Commission (FERC), "Remedying undue discrimination through open-access transmission and standard electricity market design", 31 July 2002: *Federal Register*, Vol. 67, No. 168, 29 August 2002, p. 55452.