

Policy Brief



Politických vězňů 7, P.O. Box 882, 111 21 Prague 1, Czech Republic ■ phone (+420) 224 005 123, fax (+420) 224 211 374 ■ www.cerge-ei.cz, office@cerge-ei.cz

Shortcomings of the new EU regulations for the electricity industry: The pitfalls of legal unbundling

SILVESTER VAN KOTEN, CERGE-EI

Summary

The European Union (EU) is in the process of creating a liberalized, single European market for electricity. The present study suggests that the unbundling of transmission from generation activities as decreed in EU laws and regulations (and specifically in the recent regulations the European Commission proposed in the 3rd energy packet) is likely to hamper competition in the European generation markets. These regulations allow vertically integrated electricity utilities (VIUs) to continue to own generation as well as transmission networks, provided the networks are run by an independent system operator. I argue, on theoretical grounds, that an integrated generator (a generator that is owned by a VIU that also owns the transmission network), even when receiving no preferential treatment by the network, is advantaged in transmission capacity auctions relative to independent generators (generators that are not affiliated with owners of networks). Specifically, an integrated generator in such auctions has increased “bidding power” which allows him to bid more aggressively and thus makes it more likely to win, at the expense of independent generators.

What is known?

At present the electricity markets of the EU, guided by EU directives, are being restructured to become a single EU-wide

liberalized and competitive market. A major obstacle is that there is a lack of sufficient competition within as well as between countries, and as a result electricity prices differ greatly between different EU member states.

The main reason for the lack of competition is the existence of VIUs: companies that own several of the vertical activities in the electricity supply industry, especially generation (the production of electricity), transmission (the transport of electricity over long distances), and distribution (the transport of electricity over short distances to end consumers). VIUs exist because in the past the electricity industry was typically organized in the form of state monopolies. Under the new market rules, new generator entrants need the transmission infrastructure of the VIU to be able to sell their electricity. This brings about a conflict of interest, as the VIU would like to curb competition by allocating minimal infrastructure capacity to competing new entrants.

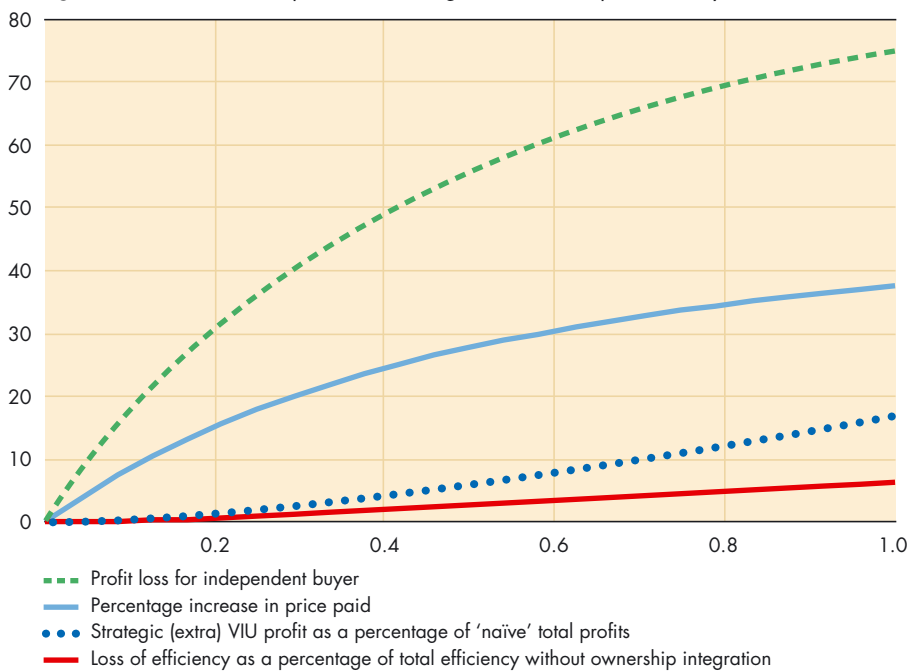
European Directive 2003/54/EC and Regulation 1228/2003 are meant to remedy these problems. They require VIUs to legally unbundle: VIUs have to move their transmission activities into a legally independent subsidiary. However, VIUs are allowed to retain ownership in their transmission activities and thus remain residual claimants to the profits when they own merchant transmission lines. More recently, the European Commission has proposed new regulations in the 3rd energy packet that, if accepted, mandate more rigorous

unbundling. However, even these stricter regulations allow vertically integrated electricity utilities (VIUs) to continue to own generation as well as transmission networks, provided the networks are run by an independent system operator.

Assumptions used in my model

In my model, generators compete for capacity on a transmission line in an explicit auction. One electricity generator, the integrated generator, is owned by a VIU that also owns (part of) the transmission line. The other generators, independent generators, do not own any part of the transmission line, neither directly nor through a subsidiary or holding company. I assume that the VIU receives a strictly positive proportion of the auction revenue, and I refer to this proportion as “the revenue absorption.” The revenue absorption is strictly positive for merchant transmission lines where the owner of the line keeps all revenues, but is likely to also be positive for regulated lines, as regulators often use a form of incentive regulation which allows a line owner to keep a part of the profits to support innovation and efficiency gains. Due to the legal separation of the VIU, the auction is fair in the sense that the highest bidder wins. While the VIU cannot influence the auctioneer, the VIU can instruct its integrated generator to maximize the total profits of the VIU,

Figure 1: Effects of incomplete unbundling with one independent buyer



The larger the revenue absorption of the VIU in transmission, the higher the loss in profits for the independent generator (up to 75%), the higher the price of capacity (up to 37%), the larger the extra profits of the VIU (up to 17%) and the higher the welfare losses (up to 7%).

which consist of generator profits plus transmission auction revenues.

Results

I show that because of the combined ownership of transmission and generation networks, the integrated generator has more “bidding power,” which makes him bid more aggressively and thus more likely to win the auction. The intuition behind this result is that a part of the payment made is received by the VIU through its ownership of the (legally separated) transmission operator. Thus, for example in first-price auctions, this part of the payment is not a net cost when the integrated generator wins the auction; rather it is similar to a discount that the integrated generator receives when winning the auction. In this sense the integrated generator now has more “bidding power,” enticing him to bid more aggressively. In second-price auctions, a similar argument applies.

The most dramatic effect of the more aggressive bidding is a decrease in profits earned by independent generators. Figure 1 shows the outcomes in auctions with one independent generator, with the x-axis showing the degree of revenue absorption. The independent generator has a decrease

in profits of 75% for full revenue absorption. Even for low revenue absorption, the decrease in the profits is considerable; a revenue absorption of a mere 0.1 results in a decrease in profits of 20%. This clearly gives the integrated generator an advantage relative to the independent generator. An important consequence is that the VIU’s total profits increase. Moreover, now the integrated generator sometimes wins transmission capacity in the auction, while the independent generator would have made more profit if he had won. In addition, the average price of transmission increases. The latter effect is probably not a disadvantage as the auction revenues of transmission lines are likely too low relative to their overall benefits, which causes a market failure of too little investment in transmission lines. The modest increase in auction revenues thus gives a small contribution to the correction of this market failure.

When there are several independent generators bidding in the auction, the effects stay remarkably strong; for details see the paper “The effects of vertical integration on auction outcomes in the EU and US electricity markets” (see below for details).

The reported loss of efficiency and fairness is the result of the VIU instructing its generator to bid more aggressively. Addi-

tional regulation might attempt to restrain the VIU from making its generator bid more aggressively, by, for example, requesting the VIU to also legally separate its generation activities and to forbid day-to-day intervention of the VIU in the affairs of its generator. The VIU would in this case own two legally independent companies, one containing its generation and one its transmission activities. In a model similar to the one that I used for the preceding analysis, I show that even under such a regime the VIU can still bias the auction outcomes to its advantage by giving the manager of the generator a bonus that is a weighted sum of profits and sales. The welfare loss is slightly lower than without legal separation of the generation activities, but still considerable (in the range of 4 to 6%). This shows that additional legal separation of the generator does not remedy the negative auction outcomes found above.

Conclusion and policy recommendations

My analysis shows that the regulations proposed in the 3rd energy package of the European Commission still leave VIUs with possibilities to impede competition in electricity generation markets. Thanks to its combined ownership of transmission and generation, a VIU will be more likely to win capacity in explicit transmission capacity auctions and earn a higher profit, and thus independent competitors are disadvantaged. The results are relevant for EU electricity markets as transmission capacity on international lines is often sold by explicit auction mechanisms. Moreover, the EU allows the building of merchant transmission lines where the owner can keep all auction revenues.

As the analysis in this paper shows, this might result in discrimination against independent generators under legal unbundling. Such discrimination is undesirable because it violates the objective of the EU electricity law Directive 2003/54/EC to create a level playing field in generation and because it makes new entry less attractive. This is a serious concern as national electricity generation markets in the EU are very concentrated and thus new entrants are needed to make any liberalization reforms successful.

Furthermore, the holding company owning the integrated seller is advantaged, and because the holding company is often the (former monopoly) incumbent, this further consolidates its already dominant position in the electricity supply industry.

It seems possible to remedy the negative results suggested by the preceding analysis. Firstly, regulators could aim their efforts at preventing auction revenues from benefiting the VIU that owns distribution or transmission networks. If successful, this would reduce the revenue absorption to zero and thus take away the basis for the advantaged position of the integrated generator. Enforcing ownership unbundling would effectively achieve this goal. Alternatively, given the strong resistance against ownership unbundling in the EU, regulators could try to achieve this goal by means of strict regulation without ownership unbundling, for example, by using rate of

return regulation for transmission and distribution networks. However, rate of return regulation has long been known to lead to welfare losses and as the electricity industry is being liberalized, it is becoming more and more attractive to use a form of incentive regulation that gives network owners incentives to run the networks efficiently and to add new capacity. Moreover, preventing transmission owners from benefiting from the auction revenue goes against the EU policy of allowing the merchant (for-profit) model to have new transmission lines built. In addition, there is evidence that network owners are sometimes able to use auction revenues in other ways than prescribed by regulators

Secondly, independent generators could be awarded an ownership share equal to that of the integrated generator. The “bidding power” of the two generators would in that case be equal, and therefore both would be

equally likely to win the auction. Giving equal shares thus provides a solution but requires the regulator to have the authority to mandate the VIU to sell shares in the transmission line to new independent generators. Moreover, implementation of such a measure brings up many practical questions, such as on what legal basis should regulators be allowed to take away ownership shares from the incumbent and for what compensation? And should ownership shares only be given to participating buyers or also to *potentially* participating buyers? Giving buyers symmetrical shares could therefore be complicated in practice.

The solution most in line with economic logic suggested by my models is to mandate ownership unbundling for distribution and transmission networks: When buyers have no ownership shares in sellers, auctions are efficient and non-discriminatory. ■

The research is presented in more detail by the same author in his papers entitled “The effects of vertical integration on auction outcomes in the EU and US electricity markets” and “Legally separated joint ownership of buyer and seller in electricity markets.” These papers are available at <http://home.cerge-ei.cz/svk/>. Financial support from GACR grant No. 104207 is gratefully acknowledged.

Principal Investigator:

Silvester van Koten, PhDr., Drs., M.A.
 Silvester.VanKoten@cerge-ei.cz
 Junior Researcher at CERGE-EI

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