

Investing in the Infrastructure for Energy Markets

Executive Summary:

The European Commission, energy ministers and energy regulatory authorities have recognised that, if the European electricity and gas industries are to offer their customers competitively priced supply and service, combined with continued reliability of transmission systems, some policy adaptations are required. The demands of 21st century economies will place a strain on parts of our 20th century infrastructure, especially since the turn of the millennium marked the incipient establishment of a true European internal market in electricity and gas.

This paper has been written by EFET at the suggestion of the Council of European Energy Regulators (CEER), and in the context of the European Commission's recent study on energy infrastructure. It addresses those policy and regulatory principles which EFET feels must be observed, in order to ensure that any proper and timely further development of Europe's transmission infrastructure is consistent with the efficient functioning of wholesale electricity and gas markets, particularly across national boundaries.

We expound these principles as follows:

- All major grid operators must be sufficiently independent of network users to ensure that investment decisions are not distorted by a conflict of interest.
- Regulatory stability must be established and protected.
- Physical congestion in existing infrastructure should be identified and the Transmission Operators required to respond to the market requirements.
- Market signals for long-term infrastructure development are difficult to achieve. The development of commodity and/or capacity trading will provide medium-term price transparency, facilitate risk management and thereby help create investment signals.
- Transmission Operators must take responsibility for the optimal interconnected utilisation of their networks and for the provision to users of information about availability and use of capacity in the whole interconnected system, the better to enable wholesale market parties to transfer and trade their energy within the EU.
- Transmission Operators must be appropriately incentivised to respond to market signals and invest efficiently in network infrastructure.
- Investments in infrastructure require long-term stability, but where wholesale markets are liquid and transparent and Transmission Operators have correct incentives, the need for long-term contracts will diminish.
- The availability of short-term capacity (preferably via implicit auctions or secondary capacity trading) is essential to the sustainable development of the competitive market. Capacity that has been contracted on a long-term basis should be subject to a use-it-or-lose-it regime.
- Merchant interconnection lines should help to provide an efficient and timely answer to demand and supply fundamentals, i.e. to market signals, indicating a requirement for new capacity construction.

Introduction:

One of the keys to the success of cross-border trading and the development of an open and competitive single European energy market are arrangements for access to transmission¹ capacities. This premise is consistent with the conclusion of the Stockholm European Council of 23-24 March 2001 that "...The creation of an effectively functioning internal market in services is one of Europe's highest priorities...and...must go hand in hand with a framework for developing cross-border markets..."

Transmission congestion occurs when the system cannot be operated to reflect market requirements. A constraint management framework should, as a primary objective, produce outcomes, which most efficiently support the underlying interaction between supply and demand. Put simply, the overall costs associated with supply, transmission, and demand should be minimised. This principle underlines the inter-relationship between supply patterns, demand behaviour, and network infrastructure.

The inability of market participants to gain access and be able to utilise the infrastructure currently in existence can lead to a situation outlined in the Commission Communication regarding European energy infrastructure "...congestion may also appear where import capacity is used less intensively, but where inadequate arrangements exist for allocating capacity, or where long-term capacity reservation agreements exist without "use-it-or-lose-it" principles".

Regulating the monopoly:

It is generally accepted that energy transmission is a natural monopoly, and therefore not an area into which competition can be efficiently introduced. On this basis, the companies responsible for developing, maintaining, and operating the relevant assets tend to be either regulated, state owned or both. Vertically integrated companies, whether they are state or privately owned, owning generation and transmission assets or natural gas producers that own pipelines may favour their own production by creating an anti-competitive environment through the utilization of their transmission systems and by cross subsidizing one asset with the other, keeping out competition and raising consumers' prices. This may also be the case if generation and transmission assets are not vertically integrated but owned by the state.

The regulation of these activities can take many forms, ranging from a pure rate of return approach to targeted incentives i.e. a portion of revenue is dependent upon Transmission Operator ("TO") performance.

Network monopoly regulation is frequently divided into one of two types, ex-ante or ex-post, based on the point at which the regulation is enforced. However, it is more important to look at the setting of the rules. Effective network regulation needs clear, transparent rules defined in advance, this approach will tend to minimise the regulatory risk faced by network businesses and allow them to raise the capital they need for long-term investments. The regulatory process must allow the rules to be

¹ The term Transmission includes both electricity and gas transportation

changed when necessary so that network users can continue to have fair and non-discriminatory access to the networks.

Transmission Operators should have an obligation to meet 'minimum standards', even if these are in effect determined by the industry itself. E.g. investing in infrastructure to meet (national) agreed criteria for the delivery capacity and/or delivery route flexibility to satisfy transparent standards for security of energy supply. Transparency in the rules/plans is essential, and regulatory 'approval' actually puts the transporter in a safer position to recover appropriate revenues.

In summary, a number of different models for network expansion can be identified, with clarity of rules being the most important factor, to allow the market to respond. In addition to this, it is necessary to allow Transmission Operators a reasonable rate of return on their investment, enabling them to raise capital for their necessarily long-term projects.

Market Needs:

Common to both forms of regulatory approach is the underlying desire to develop infrastructure in such a way as to meet the needs of the market, and to encourage the efficient and economic behaviour of market participants. The market should be viewed as being a function of the physical supply and demand interactions, both in terms of aggregate volumes and specific characteristics e.g. load factor.

Well developed commodity trading can provide investment signals for capacity, at least for 'upgrades'. The liquid market allows buyers and sellers to manage price risk (at least in the medium term) and provides the opportunity for the producer to sell commodity and capacity on a short term basis. In the gas market in particular there is an absence of transparent price signals in Continental Europe. The development of trading hubs (like Bunde-Aude-Emden) is essential to help investment decisions as well as providing short-medium term risk management tools.

It is essential that regulation and market structures are such that Transmission Operators are sent clear and economic investment signals. In pure economic terms, as with any resource, the market works to achieve two short-term objectives: 1) allocate the scarce resource to users who value the resource most and 2) allow transmission users to express the full value they place on owning the resource. However, it is important to balance these market outcomes against the long-term need to maintain and develop network infrastructure. In addition to this, a network operator's naturally monopolistic position, combined with the essential nature of the product, create a strong degree of market power, and correct incentives need to be provided to offset this power.

It is important that the market is allowed to send accurate signals to the Transmission Operators, and that they are then able to respond to these signals to provide the efficient level of network capacity. This way, the market as a whole is allowed to find the most economical solution to congestion, be this through increased capacity or an alternative solution.

To ensure liquid wholesale trading, the following congestion management characteristics would appear desirable; flexibility, delivery certainty, price

transparency, simplicity, low delivery price, ease of entry into and exit from the market, and elimination of non-price dependent loading relief.

One of the principle objectives of liberalisation is to reduce the total cost of supplying customers. This is achievable through efficiency gains in operating and expanding the physical network to support existing load and future load growth. The Transmission Operator requires investment signals to make transmission capacity available in the short term and to invest appropriately in transmission capacity for the long term.

Capacity Auctions and Signals for Investment:

One method currently popular for clarifying investment signals, at least in power markets, is the use of cross-border auctions. Auctions should be designed to provide participants with an opportunity to signal their demand for capacity at an interconnection. The success of this approach is dependent upon the quantity of capacity released, the structural nature of the markets, and the methodology employed to account for a mis-match between allowed revenues and the revenues actually received through the auction process.

In most cases only a portion of the total available capacity is sold through auctions, the remainder of the capacity is reserved to support long-term contracts typically to incumbent companies or their marketing affiliates at lower prices. In effect, two forms of capacity are created, one that is associated with long-term fixed price capacity and the other with short-term variable priced capacity. In addition, if anti-hoarding mechanisms are not employed this further artificially limits the capacity being sold through “market oriented” means. The failure to introduce effective anti-hoarding mechanisms, such as use-it-or-lose-it, that are independent of the form of the capacity acquired, will greatly undermine secondary trading, which may be viewed as a more reliable source for investment signals.

In many cases, the market participants bidding for capacity have structural relationships with the seller of the capacity i.e., the Transmission Operator and the Shipper having a common shareholder. In such instances, there is a possibility that a transfer of income or costs will produce a bidding behaviour that does not reflect the underlying demand for the product.

Finally, and related to structural issues, is the problem of allocating all of the revenues received from the auction process. If the level of revenue allowed is pre-determined then it is likely that for a congested route, auction revenues will exceed allowed revenues. Any over-recovery must be, in this instance, accounted for and set aside. In some cases these monies are made available for additional investment, or are redistributed to market participants. Both solutions produce effects, which will cloud the investment signals attained from the auction. An investment fund may lead to inefficient investment and/or skew bidding behaviour of integrated companies. A redistribution of income will, without doubt, skew bidding behaviour.

Key principles to secure efficient investment in infrastructure:

- Central to any methodology for determining future investment needs is to identify where physical congestion occurs in the existing infrastructure and require the Transmission Operator to respond to the market requirements.. This can only be achieved once clear and transparent market structures have been introduced. At a minimum, this requires that:
 - Effective unbundling is established;
 - Capacity is released to the market on a non-discriminatory and market oriented manner;
 - Anti-hoarding mechanisms are established;
 - Market focused congestion management mechanisms are introduced
 - Liquid wholesale markets are facilitated and.
 - The Transmission Operator publishes its investment plans to meet agreed or mandatory capacity criteria and consults with system users on their future requirements.
- Transmission Operators must be appropriately incentivised to respond to market signals and invest efficiently in network infrastructure. This requires a holistic approach to congestion management, recognising that the Transmission Operator has a number of tools at its disposal to counter short-term capacity constraints, e.g., in the gas market, the Transmission Operator can manage line pack levels, utilise storage, particularly LNG, activate interruptible contracts and potentially contract with third parties to purchase flexibility. It is important to strike the best balance between the complexities of regulation with producing clear incentives accompanied by swift enforcement.
- Transmission Operator(s) must take responsibility for the interconnection of their networks, and the quality issues within the whole system, to enable network users to transfer and trade their energy within the EU. In the gas market, for example, there should be an obligation on the Transmission companies to carry as wide a range of gas quality as it is safe and economic for them to do, and they should publish their investment plans so that users can see (& if necessary challenge) how the system capacities will develop.
- Regulatory stability must be established and protected. Investments in infrastructure require long-term stability and investors must be confident they can raise the necessary capital and recover the appropriate revenues. Long-term contracts are often cited as being necessary to support additional investment in existing energy networks, this observation may have been reasonable during periods of regulatory uncertainty and where there is a lack of market liquidity. Where wholesale markets are liquid and Transmission Operators have correct incentives, the need for long-term contracts will diminish. Where further infrastructure investment is needed, Transmission

Operators will be allowed a reasonable rate of return on that investment, and the investment will be commercially viable.

- Long-term contracts may still have a role in the development of infrastructure assets although they should be consistent with the development of competitive markets. As such, the volume of capacity on new-build infrastructure tied to long-term contracts should be limited to that which is required for the project to proceed. Such capacity should be offered to the wider market rather than secured by just one or a few market players with capacity being reserved for the more medium and shorter term markets wherever possible. In the absence of effective "use it or lose it" measures, caps on the amount of capacity available to any one party may be appropriate as a transitional measure to address market power issues. The length of long-term contracts should not be excessive but appropriate to the needs of the competitive market and should exclude the future grandfathering of existing rights, which is incompatible to competitive markets.
- Any form of contract should be permissible, provided that it is not anti-competitive. The European Parliament has introduced the idea of energy and/or capacity release as a remedy for cases in which the effect of one or more long-term contracts is a serious barrier to competition. Any release programme should not change the counterparties to the LT contract, or indeed alter any terms of the contract itself. Release under these principles can provide a lower risk climate for the infrastructure investor and the Infrastructure operator.
- In future, as all transit is 'unbundled' it will be clearer what revenue the transit company will need to cover their investment, and it may well be that much of any new capacity will be sold on a long-term basis to underpin the investment. There should however be a regime in place to require that unused (or forecast to be unused) capacity is made available to the market, and secondary capacity markets should be encouraged.

A role for future merchant interconnection investment?

Although merchant lines may be exempted from the common TPA regime applicable to the rest of the interconnection, they still must publish transparent and non-discriminatory TPA terms and conditions, according to Article 17 of the Electricity Directive, either if the owner controls 100 percent of the capacity for a limited period of time, or if the owner then assigns the capacity to third parties.

We have recognised in this paper that a number of different models for network expansion can be identified, with clarity of rules being the most important factor, to allow the market to respond. Traditionally, network expansions have been sponsored and/or carried out by TSOs, and we expect TSOs increasingly continue to do so within the new liberalised market environment, that is, being more responsive to the market needs and signals. In addition, other alternative ways of responding to

these signals must be promoted and facilitated, such as the development and construction of merchant interconnections and cross-border direct lines. However, we would like to stress that it then becomes critical that all these alternatives (TSOs sponsored expansions and/or merchant lines) are coherently and consistently articulated in order to render all of them compatible, and equally effective and optimal in attaining the three stated objectives as above.

For those aims, an adequate regulatory design must be implemented, and regulatory stability must be established and protected. Investments in infrastructure require long-term stability and investors must be confident they can raise the necessary capital and recover the appropriate revenues. In addition, the regulatory environment must allow the possibility of partial integration of merchant lines in the network (that is to say also on the common TPA rules applicable to the interconnection) where a quota of the capacity can be occupied by long-term contracts, as being necessary to support additional investment in existing energy networks.

Merchant interconnection lines should help to provide an efficient and timely answer to demand and supply fundamentals, i.e., to market signals. On the short term, specific regulation about merchant lines will surely unleash many developers' initiatives, which are currently under study but have not been realised because of the lack of regulatory certainty, or because of the exclusivity granted to TSOs to engage in these developments. In fact, where TSOs are not genuinely independent from other market players, the promotion of merchant infrastructure becomes a useful instrument to effectively respond to market signals.