European Regulators Group for Electricity & Gas

Firmness of nominated transmission capacity

Ref: E08-EFG-29-05
15 July 2008

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RPM 0861.035.445

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Introduction

1.1. Rationale and scope

1. Whilst physical firmness is granted on several European borders as far as day-ahead nominated capacities are concerned, there is no uniform approach on curtailments of long and medium term capacity rights at borders across Europe. At some borders, cross-border capacity is fully guaranteed (with no exception, even for Force Majeure events), whilst other borders are subject to curtailment, some with and some without compensation.

2. Different approaches have also entailed different interpretations by national regulators. In the latter part of 2007, different interpretations by regulators about the circumstances in which nominated capacities can be reduced resulted in the European Commission becoming involved regarding the application of the Electricity Cross-Border Regulation 1228/2003. As a consequence, the Commission requested ERGEG consider the issue and propose a solution that could be applied across the EU.

3. Within the ERGEG Electricity Focus Group an ad hoc group was established to review the issue and to search for a solution. Due to the complicated nature of the issue and the fact that a dedicated project group of the Electricity Networks and Market Task Force is looking at wider aspects of the issue, this paper focuses on the issue of firmness of transmission capacity after nomination.

1.2. Need for firmness for market integration and competition

4. Firmness of transmission capacity rights is important for cross-border trading, market integration and competition development.

5. In the context of explicit auctions, firmness of capacity rights ensures a clear contractual element for market players by defining risks and costs associated with cross-border trade. This is especially important for traders on either side of a border who have no physical generation and thus have to rely on wholesale markets to balance their positions. Therefore, firmness promotes market integration and fosters competition on both sides of the congested interconnection, thus benefiting end-consumers.

6. In the context of implicit auctions, the day-ahead available capacities are given by TSOs to power exchanges (PXs) which use this information as one of the inputs of the coupling/splitting algorithm, in addition to energy bids and offers on each market. Prices and volumes exchanged within each market, as well as between coupled markets, are the outputs of the algorithm. If firmness is not ensured after the algorithm has been performed (that is, after the fixing of PXs), this would imply an incorrect outcome of the coupling/splitting algorithm. It is highly undesirable for PXs and also for the market in general to have recalculations. Therefore, firmness is an important prerequisite for market coupling to develop.

1.3. Assessment of benefits, risks and costs

7. Curtailments of capacity rights that do not fall within Force Majeure are currently often compensated at either 110% of the price paid for the allocated capacity or reimbursed.

8. Both of these schemes (reimbursement and compensation) are typically applied on European interconnections, yet do not reflect the financial consequences of curtailments to the market and thus lack any solid economic rationale. This has the following negative effects on efficiency:

   - The additional risk borne by market players imposes extra costs. In bidding for capacity, market players will factor this risk into their bid price for capacity and thus their financial valuation of capacity will be lower than it would be if they did not have exposure to this risk. This risk is an extra cost to the system that can restrain the development of cross-border trade, effective competition and, more generally, the efficient functioning of the market to the detriment of end-consumers.
   - TSOs do not have appropriate incentives to take action to minimise curtailments, such as through scheduling maintenance and programmed capacity reductions when the expected value of the interconnection capacity is at its lowest.

9. TSOs have better information on the status of the grid than market participants, so they can better anticipate curtailments than market players. TSOs are also better positioned to evaluate the real necessity of any curtailment with respect to other possible counter-measures.

1.4. Network security

10. Irrespective of the need for TSOs to support market integration through efficient cross-border trade and capacity allocations, the utmost priority in electricity markets remains secure network operation. Hence, TSOs should have all means available to be able to fulfil this objective efficiently. Different measures are available to TSOs to ensure secure network operation and TSOs are responsible for choosing measures which are technically and economically most efficient to resolve the critical network situation.

2. Legislation and terms

2.1. Legislation at European and national level

11. Article 6.2 of Regulation 1228/2003/EC requires that transaction curtailment procedures shall be applied in a non-discriminatory manner and they shall only be used in emergency situations where TSO must act in an expeditious manner and when re-dispatching and counter-trading are not possible.

12. The Congestion Management Guidelines (CM Guidelines) in Article 2.5 require that access rights for long and medium term allocations shall be firm. However, it has not been defined if these access rights are physical or financial in nature, or whether this requirement is valid for both types of rights. Furthermore, according to Article 2.4, TSOs are required to optimise the degree to which capacity is firm, taking into account the obligations and rights of the TSOs involved and the obligations and rights of market participants, in order to facilitate

effective and efficient competition. According to Article 2.4 of the CM Guidelines, a reasonable fraction of capacity may be offered to the market at a reduced degree of firmness, but the exact conditions for transport over cross-border lines shall at all times be made known to market participants.

13. Article 2.13 of the CM guidelines stipulates that the financial consequences of failure to honour obligations associated with the allocation of capacity shall be attributed to those who are responsible for such a failure. If a TSO does not fulfil its obligation, it shall be liable to compensate market participants for the loss of capacity rights. No consequential losses shall be taken into account for this purpose. This article also states that "the key concepts and methods for the determination of liabilities that accrue upon failure to honour obligations shall be set out in advance in respect of the financial consequences, and shall be subject to review by the relevant national Regulatory Authority or Authorities".

14. Furthermore, Article 6.3 of Regulation 1228/2003 requires that TSOs shall make available the maximum capacity of the interconnection and/or the transmission networks affecting cross-border flows to the market participants, whilst complying with safety standards of secure network operation.

2.2. Clarification/description of terminology

15. Within the framework of explicit auctions, transmission capacity is first allocated by TSOs and then nominated by market actors. In the case of implicit auctions, TSOs make the cross-border transmission capacity available to power exchanges prior to market closure. Power exchanges take this capacity into account when fixing prices for energy for every bidding area in the day-ahead market. This procedure results in power schedules across the borders, which shall not exceed capacities published by TSOs.

16. In order to streamline this discussion, a number of terminologies should be defined. In this paper, the following definitions shall be applied:

Allocated transmission right:

17. Transmission capacity right that a market participant gains as a result of a transmission allocation procedure. This capacity provides its holder the right to nominate energy transfers between two zones in the form of cross-border exchange programmes (i.e. Physical Transmission Rights).

Nominated Transmission Right:

18. In the explicit auction framework, schedules notified to the TSOs by market participants relating to the capacity which they want to use within the capacity awarded to them. Strictly speaking, transmission rights are not nominated in implicit auctions. However, in this paper the term "nominated transmission rights" is used both for explicit auctions as well as for the resulting cross-border schedules in case of implicit auctions.

Force Majeure:

19. A Force Majeure event means any unforeseeable event or situation, the causes and consequences of which are beyond the reasonable control of TSOs.

20. This event, which is not due to the fault of TSOs, cannot reasonably be avoided or overcome, and makes it impossible for one or several Parties to fulfil, temporarily or definitively, its or their obligations in accordance with the terms of the auction rules. Very rare cases for which the network has not been dimensioned should also be considered a Force Majeure case for a TSO.

Curtailment

21. For curtailments, TSOs reduce a physical transmission right already allocated or nominated.

Physical firmness

22. In its strictest version, physical firmness does not allow TSOs to curtail capacity once allocated, neither yearly, monthly, day-ahead nor intra-day capacity.

Financial firmness

23. Financial firmness implies guaranteeing market participants a compensation scheme that makes them financially indifferent between using the capacity right and being curtailed. The appropriate compensation scheme for achieving financial indifference depends on the time frame of the curtailment.

24. This is better explained by way of an example. In the case of a curtailment, a trader holding a physical transmission right (PTR) from country A to country B and having contractual obligations for withdrawing energy in A and injecting energy in B, has to sell the extra energy they previously contracted in A and buy additional energy in B. As the extra costs incurred are equal to the hourly full price spread between A and B, the hourly full price spread is the compensation that should make them financially indifferent.

3. Issues to be addressed for achieving adequate firmness

3.1. Instruments for TSOs to ensure firmness

25. TSOs have different potential means at hand to ensure firmness of both allocated and nominated capacities. These means can be distinguished along the market's time axis as preventive and curative measures. Preventive measures are usually used in the phase before day-ahead market gate closure; curative measures in the shorter term after this gate closure until real time operation. The measures described below should be available to TSOs for both longer term preventive measures and also close to real-time.

26. In principle, it is for TSOs to decide which measures addressed below are actually used, and it should be noted that different measures can be applied in parallel. Factors influencing that decision should be the need to ensure secure network operation, to limit the impact of a measure on the market and, as far as possible, efficiency. Where alternative measures are available, TSOs should choose the minimum cost (possibly market-based) solution that guarantees network security. If TSOs experience problems (legal, administrative or technical) in the availability of these measures, it would be essential that such impediments are addressed by the TSO and that the relevant bodies (e.g. NRAs) are involved. Appropriate solutions can then be sought to facilitate the implementation of full firmness.

(i) Changes in network topology

27. If an unexpected situation occurs, TSOs can make changes in the topology of the network (such as use of phase shifters, FACTS devices, etc.) in order to cope with such situations, and redirect physical flows in the network whilst being able to keep the capacities for the market as previously allocated. Changes in network topology can be used as a preventive measure but also as a curative one.

(ii) Buying back capacities by the TSOs

28. If the TSOs recognise in the operation planning phase that, due to unexpected circumstances, the capacities cannot be kept on the amount previously allocated on long and medium term markets, they could buy back already allocated capacities from market participants on a secondary market. Buying back capacities is a preventive measure.

(iii) Countertrade

29. Countertrade is usually defined as a market based transaction initiated by TSOs between two neighbouring control or price areas, or within a TSO control area in the opposite direction of the main power flow, in order to allow for a higher amount of commercial transactions in the mainly traded direction. By countertrading, the TSO ensures that physical flows of the network are within acceptable limits. Countertrade may be considered either a preventive or curative measure.

(iv) Redispatch

30. Redispatch (jointly on both sides of the congestion or unilateral) is a measure where TSOs change generation (or load) patterns in their grid in order to change physical flows.

31. Redispatch is often used only as a curative measure after day-ahead market gate closure.

32. Generators and consumption units are directly involved in cases of redispatch if a TSO orders them to adjust their generation capacity when a trade transaction leads ultimately to a change in generation. Consequently, generators or operators of large consumption units might face higher costs (e.g. reflected in bids submitted in the balancing market) for these changes as they might result in an economically sub-optimal dispatch situation from their point of view.

33. In addition, redispatch implies that TSOs have a clear basis for ordering generators to adjust their generation capacity. This basis can be contractual or even derive from legal provisions. Moreover, TSOs require proper information on planned generation and actual generation of plants potentially involved in such redispatch actions.

3.2. Curtailments – from a network security point of view

34. Curtailments of allocated capacities and nominated programs are undesirable from a market point of view.

35. Nevertheless, the necessity to take short-term technical or market actions close to real-time from the side of the TSO might occur in situations caused by different events. Such events could be the loss of several lines, exceptional wind situations or when several big production

units fail at the same time. In such cases, the question arises of which measures are adequate and can contribute to resolve the critical situation. It must be noted that there is always a possibility that such situations can occur and that they are assumed to have more impact when TSOs are challenged to operate the system closer to the transmission limits.

36. Curtailments of cross-border nominations can help to ensure secure network operations, whilst reducing physical cross-border flows, if the curtailment is followed by actions by market parties. However, there is a risk that such responses are not (or not fully) performed by market participants and thus do not (or not fully) have the desired impact on physical flows, especially when curtailment is done close to real-time and all other means (such as redispatch) have been fully exploited already. Thus TSOs may not fully rely on the effectiveness of curtailment and might, therefore, need to prepare for emergency measures during system operation.

37. The curtailed cross-border schedules will also result in a new reference value for cross-border exchanges used in the secondary load-frequency control of the involved TSOs. So, if market parties do not (fully) respond to the curtailment at an earlier stage, the secondary load-frequency control will start to react as soon as the curtailment (and the new reference value) becomes effective.

38. Assuming that regulating power is available for the secondary load-frequency control, the congestion at the border will be reduced. However, this is not a desirable effect of the curtailment as the system might be at risk for the duration of the control action. Moreover, regulating power is meant to be used to solve imbalances between generation and load, and is not meant for congestion management.

3.3. Need for maximising cross-border capacities

39. The firmness issue can be linked to the amount of capacity that TSOs can make available to the market.

40. If curtailment is not allowed in emergency situations, then TSOs might be tempted to reduce the capacity delivered to the market in order to reduce the costs and risks of ensuring firmness. In particular, it should be taken into account that TSOs claim that it is necessary to reduce the capacity that is available to the market in order to ensure physical firmness.

41. However, of course, the impact of providing full firmness on the overall level of cross-border capacity will mainly depend on whether TSOs will be able to cover the costs they incur to ensure the firmness of capacity rights. Furthermore, it must be noted that according to some national legislation, TSOs are required to facilitate the market and to maximise the amount of cross-border capacity. If there are signals that TSOs are not performing in this respect, then the NRA should (i) closely monitor the available capacities and (ii) take appropriate measures. Possible measures vary from improving transparency of capacity calculation methods, to introducing incentive schemes, and - in the most extreme cases - penalties.

42. Offering products with different degrees of firmness might allow for maximum utilisation of capacity, whilst giving market participants the opportunity to have firm products. Provided the different products are clearly defined and presented to market participants, market

participants will have the opportunity to choose and value the different products according to their need for firmness.

3.4. Physically Firm Transmission Capacity

43. In its strictest version, physical firmness does not allow TSOs to curtail capacity once allocated (yearly, monthly, day-ahead capacity or intra-day). This condition has a number of consequences. Situations may exist in the power system where curtailments of already allocated transmission capacity could contribute to ensuring system security. Since the assessment of whether these situations falls within 'force majeure' is typically an ex-post assessment, TSOs might have an incentive to reduce the capacity delivered to the market in order to reduce the risks and costs stemming from ensuring firmness of capacity rights.

44. As ensuring physically firm capacity by buying back capacity, counter-trading or redispatching might be expensive or difficult in some situations, the possibility to grant physical firmness of allocated, but not yet nominated capacity for longer timeframes is questionable.

45. However, full physical firmness is commonly applied on many European borders as far as day-ahead nominated capacity is concerned. Indeed, at the day-ahead allocation stage, TSOs have far more precise information about the system and are therefore in a suitable position to guarantee nominated capacity.

3.5. Financially Firm Transmission Capacity

46. The price differentials for compensation of curtailed capacities depend on when the curtailment is announced to market participants. Prices used should be based on an appropriate, reliable source and provide for the ability to be standardised rather than determined by individual case-by-case assessments.

47. Three different situations are possible for nominated transmission capacities:

- If curtailment is announced after nomination of long-term transmission rights and before day-ahead price setting, the difference between the national day-ahead markets is the relevant price differential.
- If curtailment is announced after nomination, the difference between the national intra-day markets, where these exist, is the relevant price differential.
- In case no relevant price reference exists, curtailed market participants should be compensated by the TSO on the basis of the costs of balancing power in the relevant country.

48. In the context of implicit auctions, financial firmness has never been implemented insofar as it raises operational issues[1]. Market participants should not be involved in the required

[1] The arrangements needed might be substantial, since the results of the power exchanges involved shall remain unchanged. A curtailment would result in an imbalance of the agent managing the market coupling. Such deviations would have to be resolved to ensure financial firmness. A feasible solution to this issue has yet to be devised.

procedures (after gate closure) and the burden for managing such situations should be completely on the TSOs.

49. Finally, as with physical firmness, financial firmness overcomes the inefficiencies caused by curtailments as:
    - it can give TSOs incentives to reduce curtailments, depending on cost recovery rules;
    - it facilitates cross-border trade by allowing market players to be compensated for the costs incurred in cases of curtailments.

50. In principle, compensation at the market price spread makes market players financially indifferent between using their capacity rights and being curtailed. In cases of curtailment (e.g. before nominations), a trader holding a PTR from country A to country B and having contractual obligations for withdrawing energy in A and injecting energy in B, has to sell the extra energy they previously contracted in A and buy additional energy in B. As the extra costs incurred are equal to the hourly price spread between A and B, the hourly full price spread is the compensation that should make them financially indifferent.

3.6. Prerequisites for the adoption of the proposed compensation scheme

51. The prerequisite for the above mentioned financial indifference to hold is that the relevant prices for the compensation scheme are those at which the trader can sell their energy in one country and buy it in the other.

52. The basic requirements are therefore that:
    - there are markets on both sides which traders have access to;
    - these markets are liquid and;
    - on both sides there is a transparent price that can be a reasonable estimate of the price at which the traders can sell/buy energy in cases of curtailments.

53. The liquidity of the involved markets is a fundamental precondition: If no liquid markets were in place on either of the two sides, the curtailed PTR holder would be either not able to sell the extra energy in country A or not able to buy the additional energy in country B. In such a case, the full market spread hourly compensation would not reflect their costs[2].

54. In addition to the above mentioned indicators, it is important to highlight that the price variations following a reduction of interconnection capacity should not be influenced by manipulation of prices aimed at unduly increasing the compensation. The implementation of a close monitoring of market actors' behaviour just after these curtailments could have a

[2] There exist a number of different ways to assess the liquidity of a market. Potential indicators that could be considered are: the volume traded within the power exchange day-ahead market as a percentage of the total national consumption; the number of market participants; the depth of the market or resilience of the equilibrium price to changes in quantity; the bid-ask spread (not relevant for markets based on a central clearing process); and the extent to which the day-ahead price reference is used as an index for other markets.

disincentive effect on market actors to attempt to manipulate prices[3]. There might also be instances where considerations on the actual reason for a measure (e.g. a curtailment) exist. If the need for measures taken by TSOs is clearly caused by the behaviour of a grid user, it would be justified to charge this grid user with the associated costs.

3.7. Impact of different solutions on involved parties

55. In some of the currently applied schemes (e.g. reimbursement of originally paid auction price or something similar), the costs of non-firm transmission rights lie - at least partly - with the market participants. It is acknowledged that the risk constituted by this causes inefficiencies in electricity trading, which result in risk premiums in market prices.

56. If this situation was changed such that capacities were physically or financially firm, market participants would not face the risks resulting from curtailments. However, TSOs would have potentially incurred additional costs in order to provide firm capacity products. The firmness issue, therefore, ultimately amounts to how costs should be allocated between TSOs and network users (either via a grid tariff, or via auction revenues). This issue is usually under the control of the NRAs and is based on national legislation.

57. It should be noted that additional costs are particularly relevant should full firmness be implemented for borders that fall under possible curtailments without any compensation.

58. A first element of response is provided by Article 6.6 a. of Regulation 1228/2003/EC that foresees that one purpose for the use of revenues resulting from the allocation of capacities is to guarantee the actual availability of allocated capacities. In addition, it should be noted that TSOs might expect higher revenues from auctioning firm capacity rights.

59. The main drawback of a complete and unconditional socialisation of costs into grid tariffs would be that TSOs would not have any interest to keep the costs caused by ensuring firmness of capacity low (e.g. by reducing the number of curtailments to the minimum or by curtailing capacity in off-peak or uncongested hours) [4]. On the contrary, if TSOs were not able to include additional costs in tariffs (or cover them from congestion revenues or from balancing services) the financing of the companies and consequently network security would be at risk.

60. In practice, a balanced solution between these two extreme approaches (complete socialisation vs. no coverage from tariffs or congestion revenues) can be found by the respective NRAs. As a general rule, the NRA will have to adopt an approach that enables the TSO to recover all its costs incurred from carrying out its legal duties, so long as it is performing them in an efficient fashion. The methodology to be applied must be approved by each NRA in coordination with neighbouring countries, based on a fully transparent and neutral process for the directly involved market players.

[3] Regulators might need to investigate market participants' behaviour if specific actions by a market participant(s) in causing a compensation situation or manipulating the level of the compensation is suspected.

[4] As stated previously, this risk could be significantly reduced if NRAs (i) closely monitor the available capacities and (ii) take appropriate measures like the implementation of incentive schemes.

61. It should also be taken into account that it is likely that any measure that incurs costs will involve more than one TSO (e.g. in case of cross-border redispatch). The question of payment for the redispatching and for the responsibility for the measure to be taken has to be addressed. In principle, either the TSO initiating the measure could be in charge of compensation or the neighbouring TSO, who is asked to execute, for example, redispatch, should pay the resulting costs. Another solution might be to split the costs, because of the benefits for market actors in both countries in having the transmission capacity as firm as possible and as high as possible.

62. In summary, it should therefore be recognised that the firmness issue (both physical and financial) is mainly a financial issue: who will bear the costs necessary to ensure the firmness of nominations or, in cases of financial firmness, who will bear the financial consequences of compensations?

63. In that respect, NRAs have a critical role to play and should define adequate recovery cost mechanisms such that TSOs are incentivised both to maximise fully firm cross-border capacities and to minimise the cost of providing firmness. If TSOs bear too much risk with respect to the costs of full firmness (either physical or financial), it is obvious that they will be tempted to reduce the level of cross-border capacity in order to reduce their financial risk. Hence such developments would be detrimental to market integration and competition developments.

4. ERGEG's view on firmness and next steps

64. Considering the different technical, legal and economic aspects related to the firmness of capacity products, ERGEG came to the conclusion that as a minimum requirement transmission rights shall be firm after they have been nominated by market participants. Even though physical firmness is the preferred approach for nominated capacity, financial firmness is also an acceptable solution in the context of explicit auctions.

65. This means that capacity holders that have nominated transmission rights should either be guaranteed their ability to use their rights (physical firmness) or, in cases of curtailments – which have in any case to comply with legal requirements of Regulation 1228/2003 including CM Guidelines - after nomination, receive a financial compensation reflecting the relevant market price spread (financial firmness). If the curtailment is announced after the D-1 nomination deadline, this can be the intra-day price differential or the balancing market price differential, depending on the existence of intra-day markets.

66. The concept of firmness of capacity that is used in the context of implicit auctions (market coupling or splitting) requires special attention because the outcome of the implicit auctions should not be changed. The recalculation of prices at the power exchanges should be avoided. Currently, physical firmness is the only option applied in this context, whilst the feasibility of financial firmness has yet to be proved. In the event that a feasible and reasonable methodology is devised for financial firmness, which does not impact the outcome of implicit auctions, ERGEG will re-assess the issue.

67. This minimum requirement should help to create similar conditions and create a level playing field across regions.

68. The treatment of curtailments announced before nominations are outside the scope of this paper and shall be addressed at a later stage.

4.1. Framework supporting the objective of adequate firmness

69. The considerations presented in chapter 2 make clear that, in parallel to the request for firmness, a number of changes to the framework for cross-border trade and regulation should be made in order to create sound and comprehensive mechanisms.

70. TSOs have to be able to use the measures described in chapter 2.1 efficiently. In particular, existing provisions and procedures for cross-border redispatch or countertrade are not yet fully developed at a level which is sufficient for day-to-day operation. In that respect, coordination between involved parties has to be enhanced. Roles and responsibilities and processes should be defined and become more standardised. Furthermore, a basis for TSOs to buy back capacities which have already been allocated on developed secondary markets does not yet exist.

71. In general, an organised and transparent redispatch scheme would be needed. Such schemes can be market-based or cost-based, depending on the market conditions. In both cases, proper regulatory oversight is needed. This might not be ensured by the existing powers of some Regulatory Authorities, since the regulatory focus (including data provision) is usually on network companies.

72. An important prerequisite for financial firmness is the availability of reliable prices as a reference for financial compensation. Looking at existing national markets, not all countries have power exchanges or other standardised trading facilities yet which fulfil requirements in this respect.

73. Finally, ERGEG would advocate the implementation of incentive schemes which contribute to a balance between the amount of fully firm capacities made available to the market (maximisation of capacities) and the cost of providing this full firmness.