Charging Futures

Reforming electricity charging, together

ena energynetworks association

Access and Forward-looking charges

Access options at Transmission

Access Subgroup

Document Control

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Related Documents

Reference 1	Electricity Industry Access and Forward-Looking Charging Review - Significant Code Review launch statement and decision on the wider review – Ofgem publication
Reference 2	

Distribution

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Contents

1 Non-firm access options for generation at Transmission

1.1 Today at transmission if a generator has “firm” Transmission Entry Capacity (TEC) then the connection is fully compliant with the Security and Quality of Supply Standard (SQSS) meaning that the user can export at any time up to their agreed TEC (subject to any instructions in the Balancing Mechanism).

1.2 It is a customer choice for a user to be “non-firm” - all generators can take a commercial decision to be “non-firm” i.e. not compliant with some elements of the SQSS which they highlight on their application. As this decision relates to only elements of the SQSS, it cannot put the overall system at risk, meaning only the requesting customer’s access arrangements are impacted. The benefits to a generator of being “non-firm” can be getting a faster connection, a cheaper connection, or both. A connection may be faster as the generator doesn’t need to wait for other investments to be made before connecting, and it may be cheaper if for example they have a one circuit connection instead of two. The majority of new connections are “non-firm”, especially in Scotland, where almost 100% of new connections are “non-firm”. The main driver in Scotland for non-firm connections is due to the highly-constrained network, therefore non-firm allows quicker and cheaper connections than waiting for large reinforcement projects to be completed, which if triggered would also increase the wider TNUoS charge. The majority of connections in Scotland are for generators who do not require the full security of a 'firm' connection and therefore accept the lower connection costs of a non-firm connection; especially as it can be a significant distance from the generator to the existing network.

1.3 Where a generator is “non-firm” their Bilateral Connection Agreement (BCA), between National Grid Electricity System Operator (NGESO) and the generator, will set out the specific scenarios and assets under which the generators may be tripped off (or instructed to reduce MW export). The generator does not receive financial compensation under these circumstances, however the scenarios which would result in this are clear in their BCA. It is worth noting, that for any circumstance outside of those noted in the BCA, the generator would be financially firm and be due compensation. Following the completion of transmission works set out in the BCA, the generator may then become “firm”.

1.4 The Network Access Policy (NAP) is between the ESO and TOs to coordinate planning, management and operation of the transmission system. This process also aims to minimise the impact on users, and therefore reducing time when “non-firm” users do not have transmission access.

How could the non-firm options from the Access SCR work at Transmission?

1.5 Based on physical assets

- We believe that this is currently the approach taken at transmission and therefore no further change would be required. Today, as noted above, the contract between the generator and the ESO identifies the network conditions where the user would not have firm access to use the transmission system.

1.6 User outcomes

- Under the user outcomes approach, a generator would have a limit to the amount of time that their access could be curtailed, for local network and connection asset constraints and on an enduring basis for wider shared network constraints. This limit would be written into their BCA. This has been considered against Ofgem's three guiding principles below.

Arrangements support efficient use and development of system capacity

1.7 As outlined above, the decision for a generator to be "non-firm" is a commercial decision which they make, the system is then built to reflect efficient usage of all parties, managed through the NAP process, and flexibility is managed through the balancing mechanism. The introduction of a user outcomes approach would not necessarily result in a more efficient use of the system, particularly as today most new connections are already "non-firm", however as noted below there would be a cost of introducing a new customer outcomes approach.

1.8 It is important to note that changing non-firm connections would have broader implications. Today, a user is taken off without being paid under certain circumstances set out in their BCA. A move to a "user outcomes" approach where the user may start to be paid for being non-firm or when the control room need to take additional balancing actions due to the limit being reached (and therefore that generator cannot be taken off), will come at a cost to the consumer through increased balancing services costs. An approach could be taken, if the intent of this approach was not to occur any additional balancing actions, to set the threshold very high, so that a user would expect to see a high potential frequency for their access being removed. This however is likely to undermine how attractive a "user outcomes" approach is.

1.9 There is also a risk that there would be a compounded benefit for generators. The reasons a generator would accept a non-firm connection offer is to be able to connect to the system quicker, to have a cheaper connection, or both. Through a user outcomes approach, this means that a generator not only has quicker / cheaper connections, but also could have more certainty over how often they could be taken off, or even paid when these limits were exceeded. This would come at a cost to consumers (as noted above), with the efficiency of the network not actually differing however generators would benefit by having less risk.

1.10 The challenge group were asked for their views on the potential benefits of introducing such an approach. A benefit suggested was that it may increase investor confidence in supporting a new project. No benefits relating to efficient use and development of system capacity were noted by users.

Arrangements reflects the needs of consumers as appropriate for an essential service

1.11 Generators make a commercial decision today on the connection that they require for their essential service. Their BCA agreement sets out the specific scenarios and assets under which the generators may be tripped off (or instructed to reduce MW export). Outside of these specific scenarios, the generator will be financially compensated if the generator is taken off. This provides certainty over their level of access, enabling the generator to make the commercial decision to be non-firm. Under a user outcomes approach, the generator would have some additional certainty around their connection choice.

Any changes are practical and proportionate

1.12 Under this option, new BCA agreements would need to change to reflect how often / long the user is able to be taken off the system under the existing scenarios which have been identified. To do this the ESO would need to:

- Require additional resource to determine the limits which would be added into BCAs and estimate the frequency of these limits being reached. The limits would need to be reassessed as / when reinforcements are completed or the network topology changes. In addition, there would need to be additional resource in the NAP team to manage outage programmes against the new user constraint limits which is a significant new activity.

- Create significant new control room processes and systems to reflect that there is a maximum number of times / duration that a user can be taken off before alternative options need to be pursued.

    - This would require live information to be fed into the control room and NAP processes, for example data on how many hours were still available to curtail each user. To do this new IT infrastructure would be required to link together various sources of ESO information. Any new systems for the control room must undergo a lot of scrutiny, to ensure that it meets all requirements of being Critical National Infrastructure (CNI), for example it includes a lot of regression testing to ensure that the change does not have any unintentional impacts on any other control room systems and to ensure it cannot be access by any external users.

    - This would also mean that the engineers in the control room would need to look up how many remaining hours (for example) a generator had in real time, to assess economic and efficient actions, before being able to actually take any actions to balance the system. This is a significant additional complexity for managing the system, which would happen on a real-time basis, which control room staff do not have to consider today. To minimise this, actions may need to be taken outside of real time, however there would be a risk that limits are breached.

1.13 The SQSS does not support a user outcomes approach today, it notes in 2.16 that generation design variations must not "result in additional investment or operational costs to any particular customer or overall". As noted above, if the limit set for users was not exceptionally cautious, then it is likely that additional balancing actions would be required when a user has met its "limit" and therefore may not be SQSS compliant today. If this option was to be taken forward by Ofgem at transmission, the SQSS may need to be changed.

1.14 The changes outlined above are very significant changes, and do not feel practical and proportionate at transmission, where "non-firm" connection choices are quite clear for the user.

Summary

1.15 Non-firm access rights are important for transmission connected users today, it increases network utilisation and can reduce carbon (subject to the generation type connecting), however does also increase system operability challenges. Users agreements at transmission today are quite clear for when they will / will not be able to use the system, this is a commercial decision which generators make today. A change to a user outcomes based approach will come at a cost to the consumer who will underwrite any additional financial certainty, as the ESO will need to undertake additional balancing actions and generators may be paid when they were not previously as well as the ESO undertaking additional roles. It is important to balance the benefits of giving a transmission user additional certainty over and above that which is provided today with these additional costs as well as control room changes and SQSS changes.

1.16 In addition, as all transmission connected users are parties to the balancing mechanism, there is no apparent additional flexibility benefits of introducing non-firm transmission access reforms.

1.17 Although there are not currently clear benefits for evolving the existing non-firm access product at transmission to support more efficient use of the network, changes in stakeholder / system requirements should continue to be considered.

2 Time of Use access options for generation at Transmission

2.1 Today at transmission, a generator with a BCA or BEGA receives TEC which provides them with 24/7 access to the transmission system (subject to any actions in the BM). As a transmission connected generator also has a requirement to be a Balancing Mechanism Unit (BMU), they are required to submit notifications about when they will be using the system, and to what volume, for each settlement period. This operational view is used by the ESO to balance the system. In charging, Annual Load Factors (ALFs) are used in the year round portion of TNUoS which represents usage of the transmission system. A generator's ALF is calculated each year by using data from the past 5 years, where there is no history, generic load factors for the fuel type are used. ALFs therefore reflect in charging, that even though users have 24/7 access to the transmission system, that this is not always used.

2.2 This combination allows users flexibility over when they operate and which revenue streams via different balancing services they can choose to take part in.

How could the time of use options work at transmission?

2.3 Static time profiled access means that there would be fixed periods where a user is allowed access to the transmission system. This is considered against Ofgem's three guiding principles below.

Arrangements support efficient use and development of system capacity

2.4 System capacity and flexibility on the transmission system is managed through the balancing mechanism. This will continue to be the case after the Access SCR is implemented. There are no apparent additional flexibility benefits of introducing time of use transmission access reforms

2.5 A user's physical access would still be a commercial decision i.e. if they wanted a faster / cheaper connection they could still choose to be "non-firm" as well as having time profiled access. This again is a user's choice and not necessarily resulting in more efficient use of the system as assumptions over system usage, and load factors in charging are already in place today.

2.6 The ESO will continue to make planning assumptions when looking at the future requirements of the system for example through the Electricity Ten Year Statement (ETYS) and Network Options Assessment (NOA) which allow for different usage patterns of generation. The introduction of time of use access would provide additional inputs to this analysis, which would increase the work involved in these processes exponentially, as each individual generator would need to be modelled based on each half hour in the day, in addition to the existing combinations of generation scenarios already considered. As assumptions are already made in ETYS and NOA today, it is not anticipated that there would be a significant change in overall system planning outcomes. Although if the time profiled access resulted in significantly different usage that those set out in assumptions, then some changes may be seen.

Arrangements reflects the needs of consumers as appropriate for an essential service

2.7 Under static time profiled access, the periods when a user would have access to the system would be written in their BCA. The user would then be responsible to ensure that their market access via the BM or ancillary services, aligned with their agreed system access. As set out in the monitoring and enforcement paper, there is a variety of options for how this works in practice, with a physical intertrip set to the time a user having access potentially being a requirement. This alignment between physical and market access may prove a barrier for the generators view of "essential service" as it can limit their access to certain revenue streams however this may not be the case for all parties. The "essential service" of the whole electricity system also needs to be a key consideration, as noted in the section below, it would need to be clear what happens with mandatory system services e.g. emergency instructions for a generator to run, if they are outside of a user's access arrangements. This would be particularly challenging if a physical intertrip was set aligned to the users access times, as the ESO would need to be able to override these.

2.8 There is a potential benefit for some users to have transparency of when they will have access to the system prior to connection to support their modelling and forecasting.

2.9 It should be noted that when the challenge group were asked for their views on this type of access, a few respondents noted that for renewables, time profiled access is not a viable option. This is due to Time of Use access not being fit for purpose for renewables that export in accordance to the weather e.g. wind and solar.

2.10 As with non-firm access rights today, static time profiled access would be a commercial decision for generators which they may deem as being a requirement to make their connection viable from a cost or timing perspective. The likelihood of this may be reduced however due to the revenue stream opportunities outlined above at transmission.

Any changes are practical and proportionate

2.11 The ESO would require additional processes to monitor the alignment between market and physical access and ensure no instructions were given (BM / ancillary services) from the control room to the users during these periods. This real time monitoring of access rights and market participation as well as any agreed enforcement where there is a breach of access rights is a significant new role for the ESO, as today a user has 24/7 access, normally close to the physical limit they can export, so the requirement for this is minimal. This would also require changes for the control room engineers to manage, however as the physical access periods are fixed, the impact should be somewhat reduced.

2.12 Consideration would be needed as to whether the user would be allowed market access, outside of their agreed time profiled access rights, if it was for system security or in the best interests of consumers for example when the ESO is managing the system at a time where there is a low margin between supply and demand. This is not a consideration today, as all transmission connected users have 24/7 access to the transmission system and therefore all generation that can provide the required system services are almost always available. This again would be additional complexity and risk for the control room to manage and could add increased risk to system security.

2.13 As noted above, there would also need to be significant changes to our planning approaches e.g. ETYS and NOA, however it not anticipated that the outcome would be substantially different. It is not expected that there would be significant changes required to the SQSS, however this should continue to be considered as more detail on the access options develop.

Summary

2.14 Users today manage their flexibility through the BM at transmission. It is possible to implement static time profiled access if clear processes are in place to ensure physical access and market access is aligned. There is significant complexity for doing this and potential for increased balancing costs, for no clear benefit.

2.15 Although there are not currently clear benefits for introducing time of use access rights to support more efficient use of the network, changes in stakeholder / system requirements should continue to be considered.

3 Demand connections at transmission

3.1 The number of large demand connections to the transmission system are minimal (~60 sites, excluding DNO GSPs), we may see some more connections for data centres in the coming years.

3.2 Although demand connections (for DNOs or large directly connected demand) at transmission today do not include a formal capacity limit or receive TEC, the SQSS states the requirements for demand connections. As with generation, a demand customer can choose to have a connection which is not compliant with the SQSS and therefore are technically non-firm for a faster / cheaper connection.

3.3 The Targeted Charging Review (TCR) moved all residual charges to demand, and due to the residual not providing a signal to network users, also created charging bands to reduce the ability for parties to avoid these charges. The residual is the majority of the TNUoS charge for demand. It is highly unlikely that there would be a driver for a demand user to change access product to have a potential reduction in the locational element of demand TNUoS due to the minimal impact this would have on their charges.

3.4 It is therefore unclear that there are any specific benefits of introducing a user outcomes based approach for non-firm access, or time of use access products for demand. The current demand access product could potentially be adapted to include a MW limit, if Ofgem believe that there would be a use for and benefits of doing so.