



Open Networks Project

Charging Issues

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Energy Networks Association

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Executive Summary

This paper contains specific charging issues that have been identified as requiring further work by the Open Networks Charging Workstream and has been updated following comments from the Open Networks Advisory Group at their July 2017 meeting. The issues highlighted are not intended to be exhaustive at this stage. Indeed we anticipate further additions as the work of the ENA Open Networks project and the Charging Futures Forum (CFF) progresses.

The Charging Workstream considers each of the issues identified in this paper to have particular relevance to the delivery of the fully functional GB DSO model. It is recognised, however, that whilst many of the issues identified will not be taken forward by the Charging Workstream, it may be called upon to support both other Open Networks workstreams and the CFF from time to time.

This paper presents the issues on the following basis:

- High-level issue summary.
- How they are dealt with by the current charging regime (distribution and transmission).
- Where (if at all) each issue is currently being considered.
- Further commentary and options for taking each issue forward.

The Issues / Initial Conclusions

	Issue	Recommended Way Forward
1	The requirement for a common charging methodology for the costs associated with Active Network Management (ANM).	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> • The Open Networks Project WS4. <p>Options:</p> <ul style="list-style-type: none"> • Seek agreement on how ANM charges should be treated within the current price control. • Seek agreement amongst DNOs for common charging structures for more common ANM regimes whilst not restricting the ability for other ANM options to evolve.
2	The development of future compensation arrangements for distributed energy resources.	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> • The Open Networks Project WS1, with input from WS4. <p>Options:</p> <ul style="list-style-type: none"> • To review how constraint payments work in transmission and identify how similar options could be introduced into distribution, the pros and cons of and potential funding options. • An agreed standard for distributed generation connections analogous to the NETS SQSS could help provide a baseline to establish when distributed generation is entitled to constraint payments.
3	The development of cost-reflective charging arrangements for 'behind the meter' connections.	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> • Ofgem Targeted Charging Review (TCR). <p>Options:</p> <ul style="list-style-type: none"> • Agree network cost drivers in first instance in order to develop appropriate tariffs to mitigate the avoidance of network use of system charges, particularly the residual element.

Issue		Recommended Way Forward
4	The development of cost-reflective charging arrangements for reactive power across transmission and distribution.	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> The ENA High Volts workgroup / NG-UKPN Power Potential project, with input from Open Networks Charging WS4. <p>Options:</p> <ul style="list-style-type: none"> In first instance establish what behaviours we want customers to undertake and develop charging framework from this starting point. Understand cost drivers.
5	The development of cost reflective charging arrangements for electricity storage providers.	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> Ofgem TCR, with input from Open Networks Charging WS4. <p>Options:</p> <ul style="list-style-type: none"> Development of proposals aligned to T&D methodologies and the delivery of the DSO model.

In addition to the above issues, the Charging WS also considers the issues 6 and 7 to be worthy of further review. Our work on these is less developed at this stage. Additionally we have received feedback from the Advisory Group that issue 8 should be considered.

Issue		Recommended Way Forward
6	Community Energy and Local Generation and Supply have the potential to balance demand locally which could reduce system losses and avoid reinforcement of the higher voltage networks. How should network charges be calculated for such parties?	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> To be advised by the CFF. <p>Options:</p> <ul style="list-style-type: none"> Work with stakeholders to develop a proposal with broad support that can be included in the wider charging reviews.
7	Rights to connect to and access networks are applied inconsistently between transmission and distribution. This leads to consequential issues relating to connection availability, cost recovery and constraint payment between parties wishing to connect.	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> To be advised by the CFF. <p>Options:</p> <ul style="list-style-type: none"> Consider in line with current industry work on: <ul style="list-style-type: none"> Queue Management (SPEN/NGET) Programmes to facilitate the connection of DER (NGET/UKPN/WPD)
8	The level of change to charging arrangements through the existing governance arrangements makes it difficult for all stakeholders to resource/participate in the process.	<p>Proposed Group to take forward:</p> <ul style="list-style-type: none"> Ofgem, CFF. <p>Options:</p> <ul style="list-style-type: none"> Work with the CFFCFF and stakeholders to understand how process can be streamlined both in terms of numbers and breadths of change proposals.

Recommendations

- These issues should be shared with the Open Networks Advisory Group at their July 2017 meeting for comment.
- This work will be fed into the CFF as it will be of benefit to other areas of work including the EDCM/CDCM review, Ofgem's Targeted Charging Review and the National Grid's work on transmission charging.
- The Charging Workstream recommends that further analysis of these issues and their wider impact is paused pending feedback from the Advisory Group and the CFF. The Charging Workstream will review feedback provided by the CFF and present recommendations on further work to the Steering Group.

Issue 1 – Active Network Management

Charging for the provision of flexible connection services by DNOs. Specifically, how charges for the following costs associated with DNO Active Network Management (ANM) are passed through to customers:

- Service Licence fees.
- Enduring operation and maintenance (O&M).
- Replacement of equipment and associated new licence fees and O&M charges.

How current regime deals with them: **Distribution**

It is open to debate whether these charges are addressed in the current distribution charging regime. Charges are currently levied through:

Use of System Charges:

The Statement of Use of System Charges details the Use of System charges that are applied for the supply of electricity to/from Exit Points and/or the transportation of electricity across the DNOs' networks from Entry Points.

Connection Charges:

DNOs levy connection charges in accordance with the Common Connection Charging Methodology. Charges are split into 3 categories:

1. Costs for providing the connection which are to be paid in full.
2. Costs for providing the connection which are to be apportioned.
3. Costs in respect of works that have previously been constructed or are committed.

Costs are split into:

1. Extension Assets - assets installed to connect a party or parties to the existing distribution network which exclude reinforcement assets.
2. Reinforcement - assets installed that add capacity to the existing shared use distribution system.

Miscellaneous charges:

This statement details DNOs' transactional based charges which are for activities that support the competitive supply market and are billed on an individual basis for services requested. Transactional charges currently apply to the following activities:

- Energisation, de-energisation, re-energisation services and abortive visits.
- Disconnection of a site.
- Revenue protection services.
- Radio tele-switching services.
- Services Ancillary to Use of System.

How current regime deals with them: **Transmission**

In the strictest sense ANM is not currently a service utilised by NGET (SO). However, its arrangements are comparable with other commercial services such as intertrip schemes and learning points may be ascertained from these.

Where (if at all) issue is currently being looked at:

The Open Networks Project (WS1) has asked the DNOs and the SO to complete a Cost Recovery Questionnaire for ANM. It is proposed that this information will be passed to the Charging WS to take forward.

Commentary and potential options:

Active Network Management (ANM) builds on flexible connection arrangements, where connectees' network access is managed (generation curtailed or import adjusted) without direct payment in return for a cheaper connection. This involves an automated system controlling network equipment and power flows, to monitor and respond to the state of the network in real time.

Enduring charges are associated with ANM connection arrangements. Primarily these relate to (i) the licence fees, which are charged by software providers, and (ii) charges for the enduring operation & maintenance (O&M) of the ANM infrastructure. Whilst ANM provision remains at the early adoption stage by DNOs, agreements for the provision of ANM arrangements are expected to be of a fixed duration, (e.g. 5 years). At the end of this period, DNOs may negotiate new terms for the enduring service provision which will result in revised licence fees and O&M charges. This may be with new service providers. It is anticipated that these costs will be passed through by DNOs to relevant DG parties.

Options

- 1) Seek agreement on how ANM charges should be treated within the current price control
- 2) Seek agreement amongst DNOs for common charging structures for more common ANM regimes whilst not restricting the ability for other ANM options to evolve.

Issue 2 – Distribution Constraint Payments

Under today's distribution commercial framework there is no formal route for compensating parties for being constrained.

How current regime deals with them: **Distribution**

Constraint payments are not currently a service offered by DNOs. Instead DNOs are incentivised to reduce Customer Interruptions and Customer Minutes Lost. The following also are applicable:

Generation

- Firm (or "standard" DG) - Network unavailability rebates applied for connections at HV and above (1MW). Mentioned in UoS methodology (DCUSA). The value of compensation is of low value (£2/MWh) – See page 580 of DCUSA (schedule 16). This payment does not apply when Transmission system causes unavailability.

Demand

- For premises where use of system is charged under the EDCM, some customers may benefit from entering into a Demand Side Management ("DSM") Agreement with the DNO, whereby part or all of the Maximum Import Capacity will become interruptible for active network management purposes. In return for the customer will receive access to reduced Use of System Charges.
- Electricity Standards of Performance Regulations 2015 (GSoP) – Ofgem sets guaranteed standards. If the DNO fails to meet these standards, metered demand customers are entitled to receive a payment (subject to conditions).

How current regime deals with them: **Transmission**

National Grid, in its role as System Operator, currently remunerates transmission connected generation and some distributed parties for loss of access due to transmission constraints. This can either be achieved through:

- Bi-lateral agreements for defined periods of time.
- Procurement of bids and offers in the Balancing Mechanism.

Where (if at all) issue is currently being looked at:

The Open Networks Project (WS1) "Facilitating DER participation in Ancillary Services" is developing options for designing connection/ancillary service contracts which are optimised for provision by DER and allow parties to provide different services to different parties at different times. It is felt that an appropriate compensation framework may become a feature of an enduring DSO model, so need to consider the outputs of WS3 for DSO transition.

Commentary and potential options:

Need to consider how the availability of constraint payments will align with distribution system and connection charging methodologies. This also ties back to the design of transmission and distribution networks, i.e. is there a requirement to harmonise arrangements for consistency.

Options

- 1) To review how constraint payments work in transmission and identify how similar options could be introduced into distribution, the pros and cons of and potential funding options.
- 2) An agreed standard for distribution generation connection analogous to the NETS SQSS could help provide a baseline to establish when distributed generation is entitled to constraint payments.

Issue 3 – Behind the Meter Connections

'Behind the meter' connections refer to generation and demand which is located beyond the point at which the customer's electricity use is measured. For demand users, generation from these sources has the effect of reducing the customer's metered consumption leading to reduced revenue being recovered from use of system charges and vice versa. The impact of these reductions in total revenues will result in increases in other customers' charges. The impact on other customers can be significant depending on the volume of generation and demand connected in this manner.

How current regime deals with them: **Distribution and Transmission**

As stated above, use of system charges will be calculated on their net import or export requirement. Increases in behind the meter generation will be offset by increases in other users' charges. 'Behind the meter' is an emerging issue affecting both transmission and distribution networks. Any solution needs to work for all networks.

Where (if at all) issue is currently being looked at:

Ofgem is considering the impact of 'behind the meter' connections in the TCR.

Ofgem has stated that:

"we are not convinced that it is in consumers' interests for the reduction of residual network charges to drive these decisions. As noted above, the common costs of the network are not decreased by reducing the consumption of electricity from the main network, and so higher residual charges will fall on other consumers. Customers connected to private wire networks benefit from having the ability to call on the wider network whenever they need to do so, in the same way that users not connected to these networks are able to. However, under the current charging system, those connected to private wire networks will pay significantly less for the same ability to access the wider network than those connected directly to a licensed network."

Commentary and potential options:

Connected customers remain reliant on the electricity network for security and continuity of their supplies. Accordingly all connected customers should pay appropriate costs for the continued provision of the network regardless of their net import/export requirement. Appropriate options to mitigate the avoidance of network use of system charges, particularly the residual element, are required.

Options

- 1) It is recommended that network cost drivers are agreed first as set out in the Options paper and once these are complete these issues picked up in Ofgem's TCR.

Issue 4 – Reactive Power Charges

The difference in treatment of reactive power between the transmission and distribution networks has been raised by customers as an issue. At transmission, the TSO will utilise reactive power services to manage voltage levels. There is no similar model applied at distribution.

How current regime deals with them: **Distribution**

Current distribution charging regimes encourage users to operate at between 0.95 and unity power factors, regardless of actual circumstances.

Excess reactive power charges apply when a site's reactive power exceeds 33% of total active power in any half-hourly period. Any reactive units in excess of the 33% threshold are charged at the rate appropriate to the particular tariff.

How current regime deals with them: **Transmission**

The following services are utilised by the TSO to manage voltage levels:

- Obligatory Reactive Power Service (ORPS) - the provision of mandatory varying Reactive Power output.
- Enhanced Reactive Power Services (ERPS) - the provision of voltage support that which exceeds the minimum technical requirement of the Obligatory Reactive Power Service.
- Market Tender - The Enhanced Reactive Power Service is procured via a Market Tender.

Cost recovery of these services is through BSUoS charges. Any additional investment required due to reactive power is not currently signalled to parties but recovered through the TNUoS residual element.

Where (if at all) issue is currently being looked at:

An ENA High Volts workgroup recently considered Whole System voltage management solutions highlighting issues around Distributed Generation spilling reactive power onto the distribution network when the generation was not running (and therefore exacerbating transmission high volts issues).

Also the ongoing NG-UKPN Power Potential project is looking at how distribution resources can be utilised and rewarded for voltage support.

Commentary and potential options:

Options

- 1) Reference back to the technical groups is required in the first instance to determine what behaviours we want customers to undertake, (e.g. Do we need customers to absorb VARs in certain areas)? Do we want to incentivise VAR absorption in some cases?
- 2) Understand cost drivers. Currently regime penalises customers whose power factor on average outside 0.95 (lagging).

Issue 5 – Storage

Storage has an important role to play in addressing network challenges and therefore should be available to network operators to support their networks. The ENA’s response to the BEIS/Ofgem Call for Evidence “A Smart, Flexible Energy System” highlighted that it is important that charging mechanisms are developed which reflect the principles of:

- Whole system cost-reflectivity (rather than focusing on individual licensed parties) to deliver the best value for customers.
- Equality in charging to ensure that all flexibility providers and customers are presented with a level playing field.

How current regime deals with them: **Distribution**

Storage connected to the distribution network pays:

- Demand charges and generation charges.
- Distribution residual (or scaling) charges are only applied to demand charges.

Smaller storage (below 100 MW) may also receive embedded benefits when they generate.

How current regime deals with them: **Transmission**

- Storage connected to the transmission network is liable for both demand charges and generation charges. Transmission residual charges are applied for both demand and generation charges.

Where (if at all) issue is currently being looked at:

Ofgem is considering changes to the application of residual charges levied upon storage users as part of its Targeted Charging Review.

“We have considered a number of ways of changing storage charges, and in our view the most appropriate way forward is to treat storage in a similar manner to generation for the purposes of residual charging. This would mean that storage would continue to pay forward-looking charges in respect of both its demand and generation at both transmission and distribution levels, but only pay the generation residual charge at transmission level, and not pay the demand residual charge at distribution level. (There is currently no generation residual charge at distribution level.)”

Commentary and potential options:

Potential storage benefits:

- Integration of more renewables (especially solar PV and wind) in the energy mix.
- Improve energy security by optimising the supply and demand.
- Provide system stability during electricity outages by supplying energy at these times and reducing the financial costs of power outages.
- Potential reduced requirement for electricity transmission and distribution system upgrades.
- Energy can be stored when prices are low and used on site when they are high to save consumers and businesses money on their bills.
- Large amounts of energy storage can significantly reduce energy loss during transmission and distribution.

Options:

- 1) In response to Ofgem/BEIS’ request for industry parties to bring forward proposals, the Charging WS needs to help ensure that any proposals developed help align transmission and distribution methodologies and the delivery of the DSO model.