WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

A guide to Ofgem's proposals for changes to network charging

For community energy groups

Introduction

Who is this guide for?

This guide is for new and existing community energy and climate action organisations who want to understand more about how the electricity network is paid for, and how that might be changing over the next few years, to help us transition to net zero.

The guide summarises the changes Ofgem is proposing to the network charging system to help community organisations understand the impacts and be prepared for how this might change the cost of their projects.

This guide is designed to help community organisations respond to Ofgem's consultation before the 25th August 2021.

Who are we?

WPD is one of the six Distribution Network Operators (DNOs) in the UK, our cables and wires deliver electricity to homes and businesses. We are not a supplier, we do not buy and sell electricity, or directly bill customers. Our network stretches from the Lincolnshire coast, across the Midlands, South Wales, and the South West to the Isles of Scilly.

Figure 1 The area covered by the WPD network

How do we currently pay for the electricity network?

A domestic customer's electricity bill is currently around 20% network costs[1] which is made up of charges relating to the distribution network, the transmission network and for balancing services as shown in Figure 2 and described in Table 1.

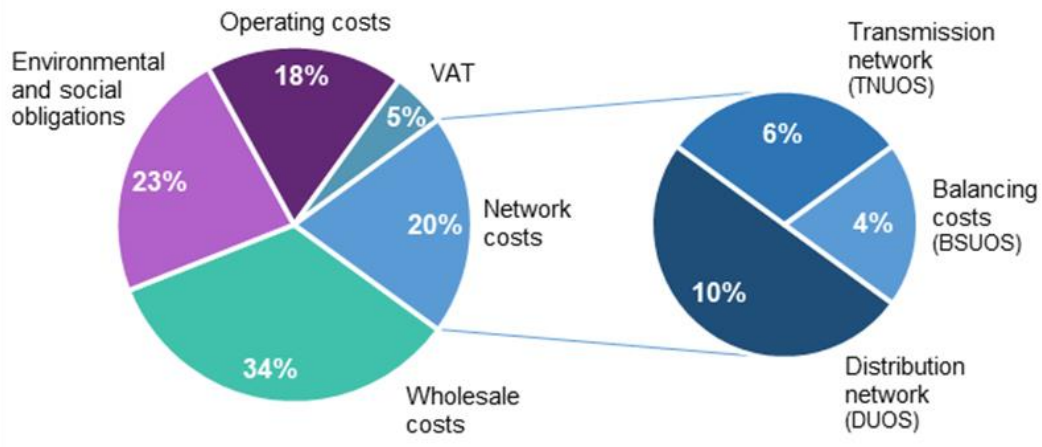

Figure 2 – Average breakdown of 2020/21 domestic electricity bill (source: Regen. Derived from Ofgem and Haven Power)

Network charge	Description
DUoS	**Distribution Use of System (charges)** Around 10% of a domestic electricity bill, these charges are used to recover the cost of running and maintaining the distribution networks from customers.
TNUoS	**Transmission Network Use of System (charges)** Around 6% of a domestic electricity bill. These relate to the cost of running and maintaining the transmission networks. They are charged to both demand users and generators and broadly separated into forward-looking charges, which relate to the incremental cost of using the network in a specific location, and residual charges that recover the remaining costs and are non-locational.
BSUoS	**Balancing Services Use of System (charges)** These charges, around 4% of a domestic bill, recover the costs of the balancing the energy system and paying for the actions taken by the Electricity System Operator (ESO) when undertaking the day-to-day operation of the National Electricity Transmission System. Both generators and suppliers are liable for these charges, which are calculated daily and currently paid by all users.

Table 1 – Acronyms and descriptions for network charges

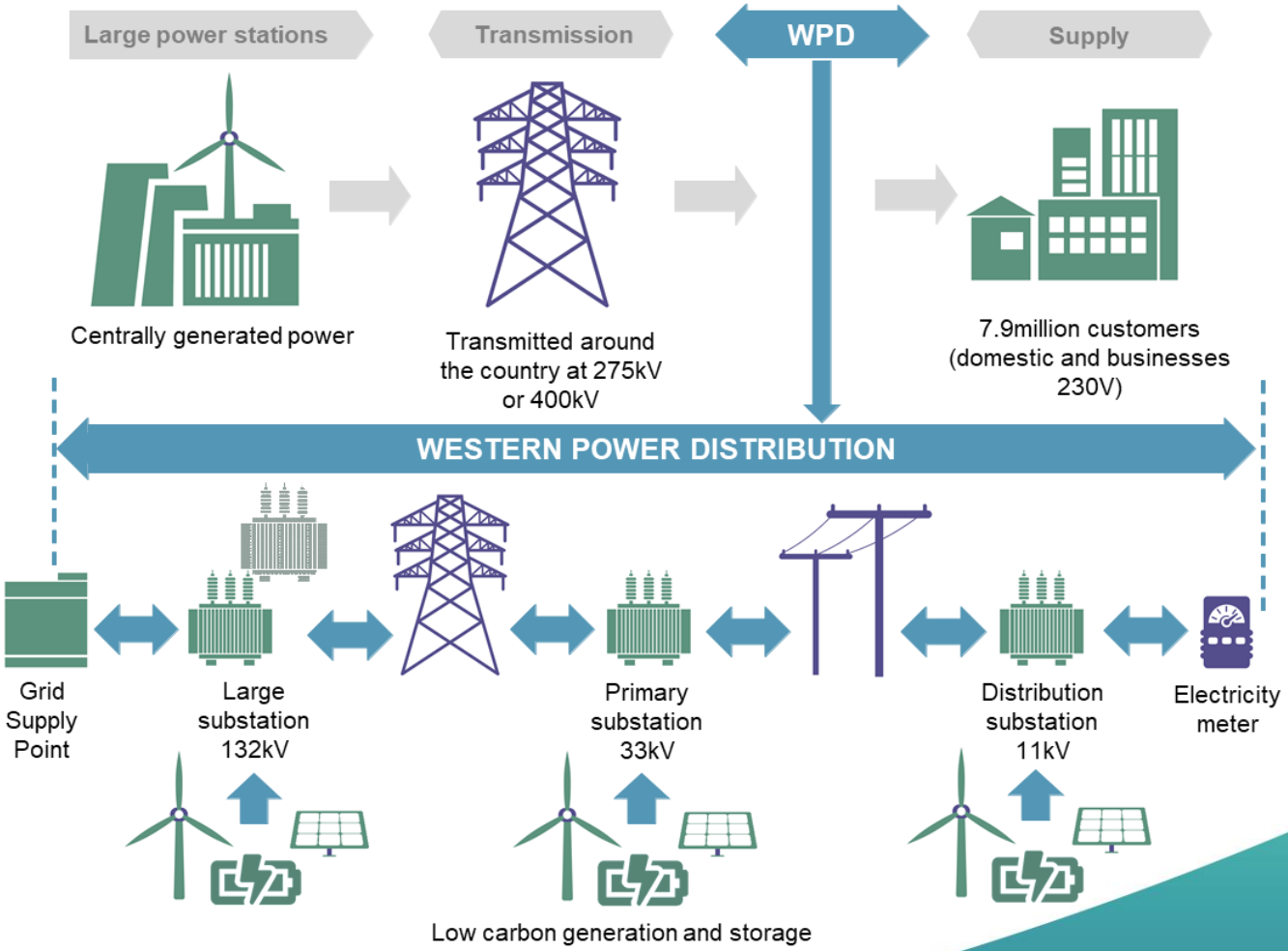

Figure 3 The UK electricity system

Overview and background to changes

Why are these being reviewed?

Ofgem launched the Charging Futures[2] process in 2017 to review how the electricity networks in the UK are currently paid for. The intention was to ensure that the charging structure supports efficient and flexible use of the network while supporting the UK's transition to net zero carbon at least cost.

Rather than a single process, changes to network charging are happening via several different workstreams, some of which have already been implemented and are outlined on the Charging Futures website.

The two key policy reviews have been undertaken as a formal **Significant Code Review**, which requires the regulator to consult widely with industry and other stakeholders, and complete an impact assessment, before new policy changes are implemented.

Residual and Forward-Looking charges

When looking at these costs, Ofgem felt there were two types of cost making up network charges, these were 'residual' and 'forward-looking' charges.

The network charging codes

Different 'codes' set out the methodology for how network charges are calculated for different parts of the network.

A Significant Code Review (SCR) provides a tool for Ofgem to begin wide ranging and holistic change to these codes. The codes related to network charging are:

- **CDCM** - Common Distribution Charging Methodology for the DUoS charges paid by those connected to the lower voltages on the distribution network.
- **EDCM** – Extra High Voltage Distribution Charging Methodology Statement. This sets the DUoS charges for those connected at the higher distribution voltages.
- **CUSC** – Connection and Use of System Code. This sets the charges paid for transmission network and balancing (TNUoS and BSUoS)

Access and Forward-Looking charges

The variable or forward-looking costs are those that are related to how and when customers use or connect to the network (e.g. which may involve installation of new network assets, upgrading substations, or other actions that the network operators need to take). These elements of network charges signal to users how their actions can either increase or decrease future network costs.

- The **access part** of the review related to new connections and what customers paid to connect at different points on the network. Within these there may be locational charges to reflect how cheap or expensive connections might be at a particular point.
- The **forward-looking charges part** of the review looked at annual DUOS charges and how they could provide locational signals about the costs or benefits to customers about using the network at different times of the day or year.

Residual costs	The **fixed costs** of the network are those where customer behaviour including how much electricity you use has no impact on the total cost. e.g. the cost of maintaining existing assets like pylons, substations and wires, which you need whether you use electricity for one day a year or 365 days. These costs could be up to 80% of the total cost of operating the network depending on what part of the network is considered. The network costs were added to each unit of electricity used and because some people use a lot of electricity and some a little, there could be a big difference to how much these customers paid towards the network. Therefore, Ofgem wanted a new methodology where costs were assigned 'fairly' to different network users.

The Significant Code Reviews

The Targeted Charging Review (TCR) looked at how network customers paid for the residual costs.

Ofgem had concerns that some customers were able to avoid paying for their 'fair share' of the fixed costs of the network. For example, some transmission charges are levied only at peak periods where electricity usage is typically high, like on winter evenings. In this triad system, (a triad is one of the three highest peaks of electricity system demand between November and February), if you are a large energy user you can avoid using a lot of electricity during these periods, then the charges you pay will be much lower despite your impact on the network still being high.

Ofgem wanted to update the charging methodology to ensure the 'fixed' network charges were 'fairly' distributed and more accurately reflected each customer's contribution to the network's costs.

Ofgem announced their decision about the TCR in December 2020 and the main changes will be implemented from April 2022. **A key change will be to increase the proportion of network costs which are recovered as a fixed network charge paid by the biggest demand customers.** This means their actions will no longer reduce the charges they pay and therefore may reduce the incentives for these big customers to turn down demand during peak periods or to be energy efficient.

The Access and Forward-looking Charging Significant Code Review (SCR) looked at forward-looking costs.

The objective for the Access SCR is "to ensure electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs on energy bills in general"[3].

The review looked at the fairness of on-going locational charges (annual DUoS), whether the cost signals in the network charging mechanisms that determine who pays what and where, reflected costs that are related to being a customer in a particular location. For example, network demand charges may be higher in an area of high demand such as the middle of a city, or generators may face higher charges in an area of higher generation where there isn't much demand.

The review also looked at 'one off' locational charges related to what customers pay to connect to the distribution network. There are different costs and calculation methodologies depending on whether customers were connecting to the transmission or distribution networks. The review considered whether this was resulting in costs being unfairly split between transmission and distribution connected customers.

A key part of the SCR was therefore a review of the' shallow-ish connection boundary' or the' depth of the connection charge' faced by distribution customers. These terms are explained further on the next page.

Explainer: Shallow-ish, shallower or shallow connection charges

The terminology used to describe connection boundaries can be confusing, but they are essentially based on whether a connection customer has to pay for any reinforcement required to the network upstream of their connection point.

This happens if a project has 'triggered' an issue e.g. the additional electricity flows that the customer will add to the network with what the network can support would result in the network not being able to operate within the standards that ensure that electricity is delivered safely, at the right voltage and the right quality.

When a customer connects to the network, there may need to be new underground cables, overhead wires, transformers or substations that connect the customer to the network. In addition, there may be a need to change existing network assets so that they can provide greater capacity to carry the additional electricity.

Shallow connection charges	Shallow-ish connection charges
A **shallow connection boundary** means the customer pays only for 'sole use assets' to connect to the network. This means that if the electricity being generated by a new wind farm causes an issue on the existing network, they don't directly contribute to the cost of the investment to improve the network to support them. The costs of that work are shared among all network customers**.** **This the current arrangement on the transmission network**.	A **shallow-ish connection boundary** means that a new customer pays for the sole use assets to connect to the distribution, as well as a proportion of the reinforcement or upgrades to the network to support their new renewable generation or new Electric Vehicle (EV) charger for example. In particular a project in a constrained area could pay: • a proportion of the cost of reinforcement to shared network assets at the voltage of connection • a proportion of the cost of reinforcement to shared network assets at the voltage level above the point of connection. **This is the current arrangement for both generation and demand customers on the distribution network and is shown in Figure 4.**

The cost of reinforcement paid by each customer varies significantly depending on the proportion of the network the customer will use (e.g. if a project uses half the capacity of the substation, they will pay half the cost of the reinforcement). The costs paid by the DNO are then recovered through DUoS.

Connections to the distribution network are also subject to a **High Cost Cap.** This means all reinforcement costs in excess of the High Cost Cap are paid for solely by the customer. The level is set at £200 per kW. This measure is meant to prevent new connections triggering especially high-cost reinforcement.

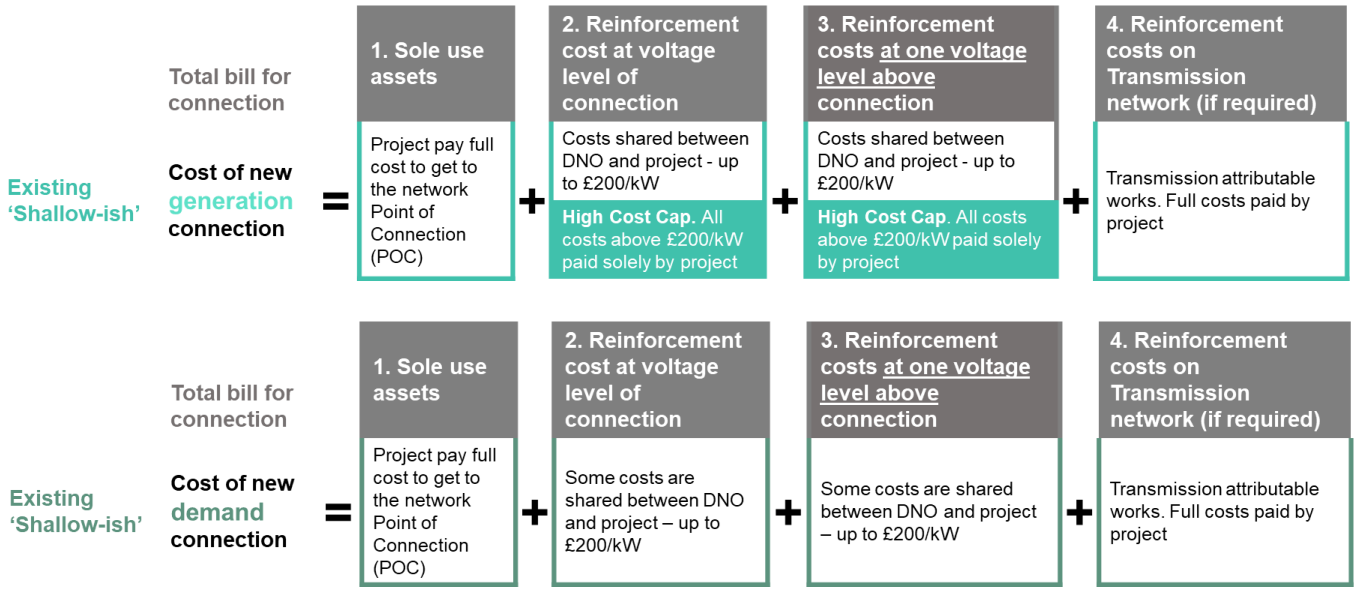

Figure 4: A diagram illustrating the shallow-ish charge for generation and demand to connect to distribution. (Source: Regen)

What was the issue?

Inefficient investment for the future

The SCR review had some guiding principles[4] for the options, which are outlined in the consultation, including whether arrangements supported efficient use and development of network capacity. In particular the review assessed the changes on whether **arrangements support decarbonisation and contribute to meeting net zero targets, including in relation to impacts for low carbon technologies**.

The review also had two other guiding principles:

- Arrangements reflect the needs of consumers as appropriate for an essential service
- Any changes are practical and proportionate

Ofgem started the review because they believed that current systems were not conducive to efficient use and development of the distribution network. They also felt that the upfront charges for connections on the distribution network as a result of the 'shallow-ish' connection boundary, created a barrier to investment for new projects on the distribution network. Customers connecting in certain areas would need to pay large costs towards reinforcement but customers connecting before or after them would not face the same charges. The arrangements on the distribution network were also inconsistent with the arrangements at transmission.

In publishing the minded to decision, Ofgem concluded that the current system did not support efficient investment: "*the current arrangements…. contribute to DNOs taking an incremental and reactive approach to reinforcement as the means of facilitating new connections, rather than investing in light of anticipated wider network needs*."[4]

What this means:	**Ofgem is hoping that the proposals will help distribution networks strategically plan and invest for the future, unlocking new demand and generation capacity on the distribution network.**

What is being proposed?

Ofgem decided to split the SCR, announcing the minded-to decisions in the areas like access charges, which they are comfortable with, but delaying changes to areas that need more work.

Access decisions: Ofgem made a minded-to decision[5] to reduce the cost of connecting to the distribution network by removing or reducing the amount new customers contribute to reinforcement. So instead, these costs will be recharged through annual distribution network charges and paid by everyone in a DNO area.

This recognises that it is not the newest connection in an area that has caused this constraint, but instead it is the sum of all the existing demand and generation in the area. These changes should allow the DNOs to more strategically invest in the distribution network where previously they were obliged to only upgrade to support the needs of each individual change.

The previous approach ensured that the network was only upgraded where there was a demonstrable need for change and avoided money being spent on "stranded assets" that were either larger than necessary or not required at all. However, we know that meeting our net zero targets will involve significant changes in both demand, due to low carbon technologies such as electric vehicles and heat pumps, and renewable generation. This means we need to take a strategic view of investing in the network and planning long term development to avoid stranded assets.

What this means:	Connecting to the electricity network in constrained areas should get cheaper.

Forward-Looking charges: Ofgem, however, decided to delay some decisions about the changes to the annual charges and making those more cost reflective.

This is because they want to explore how these charges interact with flexibility markets, which create market signals to manage supply and demand by monitoring the energy flows across the network. They are therefore doing more work on in their Full Chain Flexibility[6] strategic programme.

What this means:	The annual charges paid by customers is also changing but no decisions have been made yet.

The key minded-to proposals

Key proposal:	New demand connections to the distribution network to become 'shallow'

This means that the charges paid by customers connecting electric vehicle chargers or a heat pump in a constrained area should become cheaper as you will no longer need to directly pay part of the reinforcement or upgrades required to the local electricity network, this will instead be charged to all customers through DUoS.

This is also good news for new home developers and businesses that might want to expand their demand capacity or electrify processes. You will still however need to pay for the 'sole use' assets, so the cost of getting to the network or a change in assets that are used only by a single connection.

For the largest schemes connecting at the highest voltages there may also be a requirement to pay for upgrades to the transmission network that are triggered by the new connection.

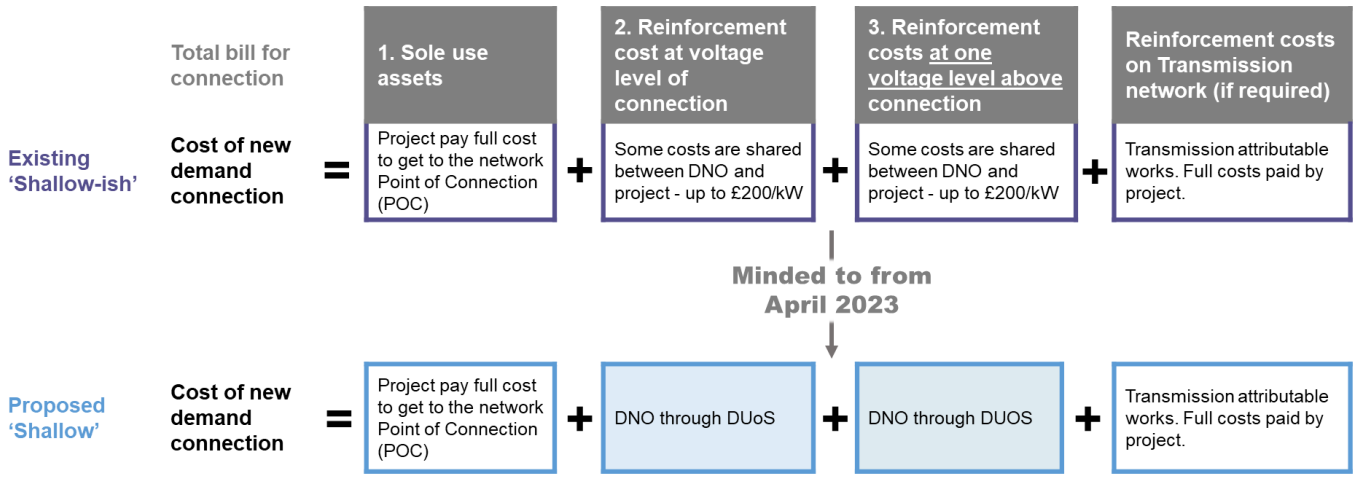

Figure 5: A diagram illustrating the connection boundary proposals for demand. (Source: Regen)

Key proposal:

New generation connections to the distribution network to be 'shallower'

This should mean that the costs of new generation connections such as solar PV arrays or onshore wind farms, will become a little cheaper for the customer connecting the new generation, particularly if the network is constrained at the voltages above connection.

Community and local energy stakeholders have been calling for this to be reduced as much as possible for some time, because the cost of reinforcement at the voltage level above the point of connection has made some community energy generation projects financially unviable.

Ofgem is considering removing the requirement to pay for reinforcement on the network at the voltage above the connection voltage. For example, a generation connection at 11kV will no longer need to pay for reinforcement at 33kV. Often the 'one above' element of the connection cost is where you will see the highest costs.

Ofgem is not treating new generation the same way as new demand, because of the way that distribution system charges (DUoS) are calculated. This means generators can receive credits for being located on the distribution network as they 'net off' demand charges. Ofgem feel it would not be cost reflective to make it both cheap for generation to connect and give them credits.

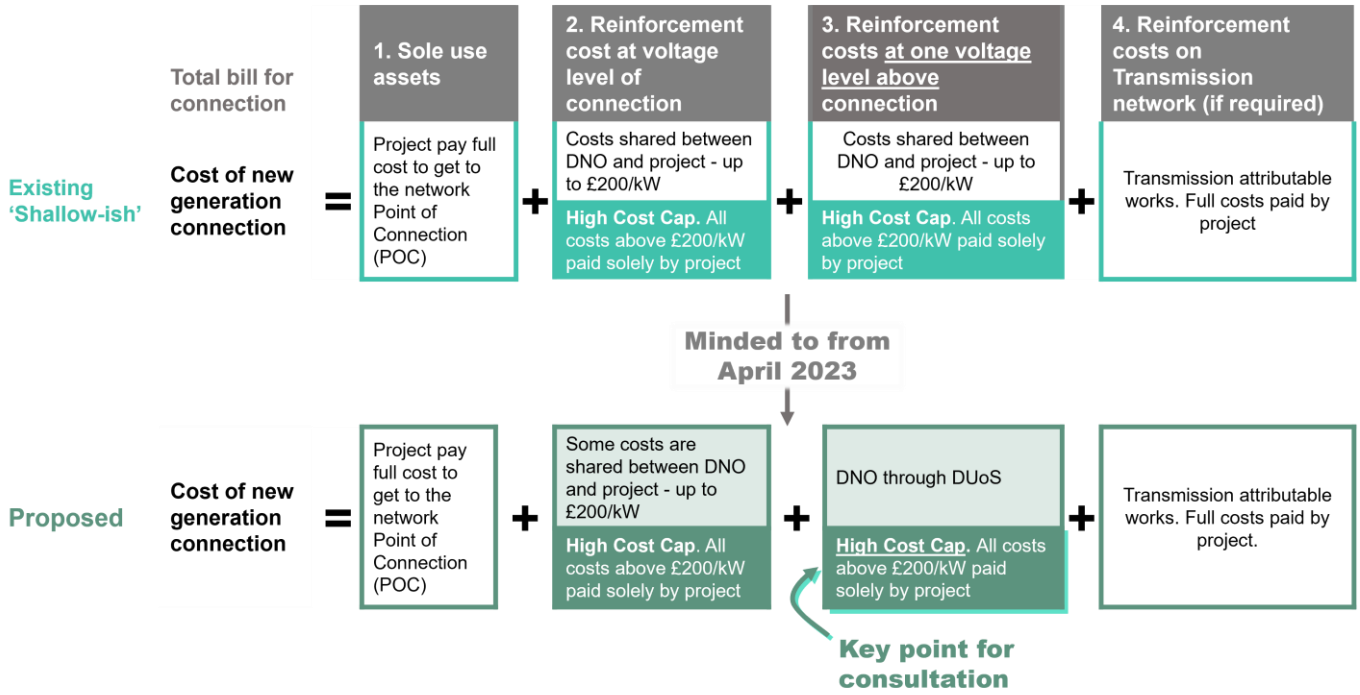

Figure 6: A diagram illustrating the connection boundary proposals for generation. (Source: Regen)

Key proposal: Retaining the High Cost Cap for generation

Ofgem is proposing that new generation will still have sole liability for reinforcement deemed to be 'high cost'. This is defined as being above £200 per kW of capacity.

The consultation contains a key question about what voltages this cap applies to (question 3e, p.29-30 of Ofgem's consultation document). Ofgem is considering leaving this as a liability for all costs at two voltage levels, but they are asking whether it should also be reduced to one voltage level.

Removing the cap at the voltage level above connection could have a big impact on some community projects and is likely to be more conducive to strategic investment.

Key proposal: Improved definition and choice of access rights

Most DNOs already have a system of 'Active Network Management'[7] in the most constrained areas of their network. In these areas new connections have a flexible contract which means they can be turned down or off when and if the network limits require it. While DNOs provide illustrative estimates of how often a customer is likely to be constrained in a year, there is no cap on how often customers will be constrained and there is a risk that it could be significantly more than the estimated value.

This makes it more challenging for community and local energy stakeholders to make revenue projections and access finance, because of the risk of being turned off.

The proposal from 2023 is that new projects or connections will have a wider range of options for how “firm” their connection access would be and the option to have a time profiled flexible connection which allows for different arrangements during different times, e.g. peak and off peak periods, rather than having the same arrangements in place all year round.

These options will provide a level of certainty on the constraints they will face, how often and when they are likely to be turned off. Under these contracts the user would be compensated if the network constraints are above those contracted.

Ofgem feel that these flexible contracts may be a way to allow faster connections to the network without waiting for reinforcement that may be required. If the network is upgraded, then these connections may move onto a ‘firm’ contract.

Key proposal: Transmission network charges to apply to small generators

The announcement includes the minded-to decision that small, distributed generation will eventually be liable for wider transmission network charges, that currently do not apply to generation under 100 MW.

The impact of this is difficult to assess because transmission charges vary across the UK and in some areas they are actually a credit. The credits are mainly for generators who are located close to demand, e.g. near cities or built up areas.

It is possible that small generators in England and Wales, particularly solar, will see a benefit and an additional income stream from these charges. In Scotland or for generators in remote locations is it likely to be a charge.

Ofgem noted however that this change is not immediate. Instead, they are conducting a review of how TNUoS is calculated and that this may impact what charges small generation will receive or pay.

As a result, this area remains an uncertainty for small generators, though it is certain that transmission charges will apply at some point in the future.

Summary points of the consultation

New connections will still need to cover the cost of 'sole use' assets and these can be expensive.	All new connections will still pay the cost of 'sole use' network assets, these could still be significant if the projects are sited a long way from the network.
New demand connections could see reinforcement costs removed and this might reduce the customer's cost to connect, particularly in constrained areas.	The consultation contains good news for community energy organisations working on projects that increase demand such as electric vehicle charging or heat pumps as it should reduce the costs of these connections.
There could be cost reductions for new renewable generation and storage projects though how much will depend on the decision on the High Cost Cap.	For renewable generation such as solar PV or onshore wind, the benefit is lower but the decision on the High Cost Cap will significantly affect how much this will help new connections in areas that face constraints at higher voltages.
With the changes new projects could face more uncertainty about how long it will take to get a connection.	The network may want to collate together requests and upgrade more strategically, though this reduces the cost for each project, it is likely to have implications for how soon the project can connect.
New projects may be offered flexible connections in the short term, ahead of reinforcement of the network.	The lower cost connections may reduce how useful the flexible connections are for DNOs and projects, but they could still be used to allow connections to get onto the network quicker ahead of reinforcement that may be required.

What happens next?

Community groups are encouraged to respond to the proposals in the Ofgem consultation which closes on 25 August 2021.

The full consultation as well as instructions on how to respond directly to Ofgem can be found here: https://www.ofgem.gov.uk/publications/access-and-forward-looking-charges-significant-code-review-consultation-minded-positions

WPD and Regen will be holding an online forum on the 18th August, 10:00 to 12:00. This is for community and local energy stakeholders in Western Power Distribution's region who want to understand Ofgem's 'minded-to' proposals on the Network Access and Forward-looking Charges Significant Code Review (SCR), and potential impacts on local energy projects. At the forum, we'll be explaining these proposals, with experts on network charging helping us explore impacts on the democratisation and decarbonisation of our energy system.

To register for the online event, please use the following link:
https://us06web.zoom.us/meeting/register/tZIld-qrpzIsGdzI0RnarE_YEp1BK3_bI8Hw

References

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2	http://www.chargingfutures.com/
3, 4 & 5	https://www.ofgem.gov.uk/publications/access-and-forward-looking-charges-significant-code-review-consultation-minded-positions
6	https://www.ofgem.gov.uk/publications/forward-work-programme-202122
7	https://www.westernpower.co.uk/our-network/active-network-management-anm

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Western Power Distribution (South Wales) plc, No2366985
Registered in England and Wales
Registered Office: Avonbank, Feeder Road, Bristol BS2 0TB

wpdnetworkstrategy@westernpower.co.uk