Zenobē Energy's Response to Ofgem's Consultation:

`Future Charging and Access programme – consultation on refined residual charging banding in the Targeted Charging Review (TCR)'

25th September 2019

Introduction

Zenobē Energy (Zenobē) is the leading UK-based owner and operator of grid-connected batteries, financed by over £80 million of equity invested by the board, private investors a US-based early-stage infrastructure fund and Jera, a joint venture between TEPCO and CHUBU, the two largest generators in Japan. The company has built, owns and operates over 72 MW of 'In-Front-of-Meter' commissioned assets spread across eight sites. Its portfolio of batteries is contracted to supply services to National Grid, including Fast Reserve, FFR, Capacity Market T-1 and T-4 (the latter are currently suspended).

In addition to providing services to National Grid and the EMR, Zenobē also provides its battery and financing expertise to support fleet operators to make the transition to electric vehicles. In May 2019, we launched up to £120 million of funding to accelerate the rollout of commercial electric vehicle fleets. Our site at Guildford for Stagecoach is the first battery and charger combination supporting the charging of EV buses with other schemes being built and commissioned by Zenobē in Newport, London, Birmingham, Leeds and Coventry. The services provided by Zenobē include the design financing, installation and operation of charging infrastructure as well as the financing of batteries and the chassis of the buses/fleet EV vehicles. Currently, the company has or is in the process of negotiating contracts to support a total of >100 EV buses and the associated charging infrastructure.

Zenobē also offers its battery and financing knowledge through a range of services to commercial and industrial companies including utility companies such as water companies, to support their efforts to reduce their environmental impact and improve the use of renewable electricity.

Overall objectives

Zenobē is a strong supporter of the Government's broader policy objectives of managing the efficient transformation to a smart, low carbon, decentralised energy system, including the electrification of transport. However, we do not believe that Ofgem's preferred option delivers these objectives. We contest the fairness, proportionality and practicality of users' allocation of residual fixed charges by segments. The methodology, as described, will lead to adverse effects including gaming. The method is arbitrary, difficult to implement and, we believe, unfair.

Key points

- We support Ofgem's principles of fairness, practicality, proportionality and its aim to reduce harmful distortions. A fixed charge for all types of users will not meet Ofgem's objectives. The methodology, as described, will lead to adverse effects including gaming. The method is arbitrary, difficult to implement and, we believe, unfair. We provided a rationale to explain why the hybrid option, comprising a fixed charge for smaller users with agreed capacity charges (a charge per kW) for larger users will be a better option.

- Zenobē urges Ofgem to reviewed their impact assessment analysis on storage deployment. We have previously provided a confidential respond with real case studies showing the impact assessment. We welcome the opportunity to meet with the TCR team and provide more evidence on case studies and current levels of costs and revenue streams available for storage, if needed.

- We appreciate that Ofgem's remit has not been updated to align with measurable carbon emission targets. However, the TCR reforms will delay renewables deployment by more than 5 year, having detrimental effects for future consumers and the environment. Ofgem recognises in its Forward Work Programme that in order to protect future and existing consumers, Ofgem should deliver lower environmental impacts. We urge the regulator not to take any actions having an adverse effect on the UK's zero-emissions targets.

Why the fixed bands' segmentation option does not meet Ofgem's principles.

Reducing harmful distortions

Ofgem aims to incentivise consumers to make better use of the grid, i.e. to free spare capacity and to reduce harmful distortions like 'gaming'. We do not believe fixed bands to be the best option to achieve Ofgem's objectives as;

- For some customers, a small change in their capacity will lead to a significant reduction in charges. As shown in Figure 3 of Ofgem's open letter on TCR, a user A with 2,500 kVA (High Voltage) agreed capacity would incur £200,831 per year of residual charges while a user B with 2,400 kVA (High Voltage) will only pay £80,643. User A has a strong incentive to reduce its capacity. Making a marginal change to its agreed capacity (4% reduction) will allow A to reduce its contribution to residual charges by 60% or £120,188 per year.

- We see different ways how this reduction can be achieved:

    a) Incumbents (current customers) will not have the opportunity to choose the banding category assigned to them. New customers will have a choice and therefore will have a relative advantage, this system is unfair for existing customers.

    b) Fixed charge's cost is spread across variable charges, the more a user consumes the less he will pay per kVA within a band. If for the same price different levels of services are available, rational behaviour would be to choose the highest level of service.

    c) A user with 2,600 kVA HV capacity who would normally pay £200,831 could split the site by having two separate meters. The new agreed capacity will then be 1,600 kVA + 1,000 kVA (for example). Each new site will pay a fixed residual charge of £80,643 and £37,334 = £117,997. By virtually splitting the site in two, the user can save more than £80,000 per year.

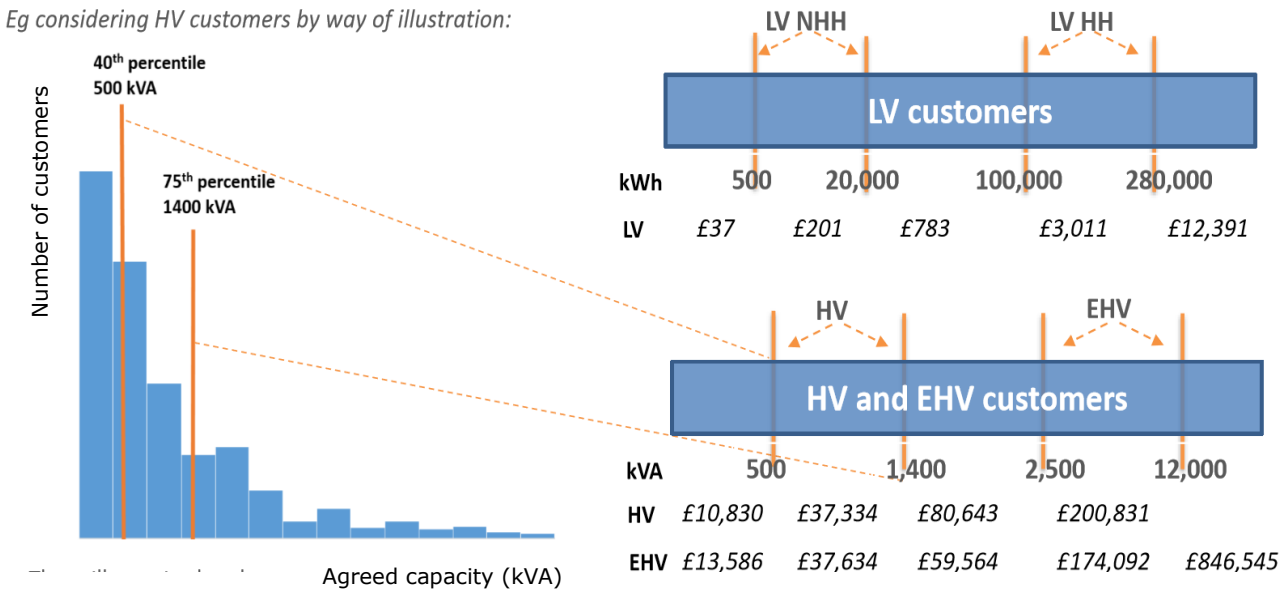
Ofgem's preferred option, fixed charge for all consumer encourages 'gaming' and creates harmful distortions. Users are incentivised to choose a level close to the upper end of each band.

The fixed banding charges option will increase the overall cost of the system. Harmful distortions will be introduced with a small number of customers having the possibility to switch bands and make significant savings without reducing their impact on the grid. A linear charge (£/kVA), would reduce the incentives for gaming as the savings made for an incremental change are not disproportionate. To ensure customers do not 'lie' when reducing the agreed capacity or maximum import capacity, Ofgem could put in place a penalty system whereby users who exceed their agreed capacity level pay a fee. The penalty should be high enough that the customers will only change their level of maximum import capacity or agreed capacity if they will not exceed their limit. Therefore, any changes made by users will translate into spare capacity and saving for all consumers.

Fairness

Every user should pay a fair amount, representative of the level of service they require from the grid. Ofgem's preferred option is not fit for fairness.

Customer Characteristics - Charging Futures Forum 19 September 2019



a) Ofgem will review the bandings (period to be decided). The factors influencing the redistribution of the bandings will be the number of users, their distribution and the overall cost of the network. Individual users' behaviors will not have a direct impact on the new boundaries. Consumers could be moved to the next category incurring significantly higher residual charges even if they did not change their agreed capacity or impose a higher cost to the network.

b) Using the example provided in Ofgem's Open letter:
   - a user with 11,000 kVA (Extra-High Voltage) agreed capacity would incur £174,092 per year of residual charges while a user with 13,000 kVA (Extra-High Voltage) will pay £846,545 per year i.e. an increase in charges of 486% as a consequence of an 18% increase in grid capacity.

We believe that these disproportionate payments will encourage gaming of the system by larger users to ensure that small variations in capacity do not result in large variations in costs. If

consumers are unable to game the system because they are far from a low border of a band then the system will encourage them to increase demand and utilise the capacity available at no extra cost, further increasing the strain on the system, driving perverse behavior and not providing any additional revenue to support the system's usage. We believe that this will be unfair for other users, particularly smaller ones, that cannot change their usage and benefit from the fixed cost available capacity.

We believe that a linear charge (£/kVA) to be a better option. A proportional charge by definition reflects the right level of capacity a user is allocated. This option would lead to the optimisation of the agreed capacity of each user, and therefore an optimal level of grid reinforcement. Consumers won't be able to hold extra capacity without incurring the cost and passing it to other users.

Practicality and proportionality

We do not believe Ofgem's preferred option to be practical or proportional. For end-users, it would be difficult to understand the reasons behind the methodology and why/how/when the charges will change in the future. Most consumers will be unaware that when Ofgem decides to review the bands, and therefore their charges will significantly increase as shown in the examples above.

Each DNO will have different bands. The end-user will have numerous tariffs depending on location, voltage level, type of meter. For a non-energy expert, this can be complex and difficult to understand and will add considerable cost either by building knowledge of the options or by employing professional advisors.

Consequently, we believe that a linear charge per £/kVA reflecting consumption would be easier to understand and more economic to implement for all consumers.

The methodology of Ofgem's proposal is not practical. Ofgem will need to justify the boundaries of the bands each period, and we can anticipate this being a problem for those who are moved to the next band.

If the charges or bands are 'frozen' for a period of 5 years, network operators and suppliers will have to forecast the total cost, the number of connections at each level of voltage, grid constraints and residual charges for a period of 5 years which will be difficult and open to challenge. To account for the risk and unpredictability, the charges are likely to be set up at a higher level and then pass through to end consumers. A linear charge (£/kVA) will give suppliers and network operators greater certainty that they will be able to recover the residual charges and therefore they won't need to charge end users a premium to cover the uncertainty.

Frontier's model

Renewables

Issues that we have identified with Frontier's model include:

Frontier assume a 1MW for 1MW substitution i.e. that every MW of onshore wind and solar PV that will not be deployed as a consequence of the TCR reforms will be substituted by offshore wind. The assumptions are based on a forecast of CfD payments increase, this week CfD prices hit a record low. Again, we urge Ofgem to review the model assumptions.

Frontier expects the level of renewables compatible with a Community Renewables FES scenario will only be achieved in 2030, with a 5-year delay in deployment.

`*In response to the reduction in subsidy-free renewables, we, therefore, make the assumption that the government would maintain the level of output from renewables assumed in the relevant FES18 scenarios by supporting the next cheapest alternative technology i.e. offshore wind. This means that the reduction of onshore wind and solar are replaced with the equivalent amount (in energy terms) of offshore wind. However, we assume drop-outs from new solar and onshore wind from 2021, and the timing of the CfD auctions means there is no mechanism in place to replace the drop-outs until 2025/26 at the earliest […] This means there is a net decrease in renewable generation in the 2021-2029 period, which has knock-on impacts for the consumer and system cost analysis'*

Frontier even qualifies renewables deployment as an 'inefficiency'.

'*However, the increase in system costs is not reflective of an* ***inefficiency*** *introduced directly by this policy. Instead, it is a reflection of the assumed policy choice imposed on this analysis that renewable energy production levels should be maintained, but that this is achieved via the replacement of onshore wind and solar PV with more expensive offshore wind.'*

Network costs

Offshore wind projects are already finding it challenging to obtain a connexion agreement and UK customers paid more than £100 million in 2017 to curtail wind farms.
Storage can provide a solution to these costs but the proposed TCR reforms are expected to penalize storage rather than support its development. As Frontier does not include that extra

cost in their model. '*Note that we do not include an estimate of other (onshore) network costs for any technology. These are difficult to forecast with any certainty'*, the costs associated with these curtailments and the benefits offered by storage are not considered by Ofgem.

The extra costs incurred by UK consumers and the benefits that could be provided by storage are not marginal and should be accurately forecasted.

Storage

The assumptions made by Ofgem and Frontiers do not reflect stakeholders' feedback and investment environment, in particular for storage. Zenobē provided a confidential response to the minded-to consultation on TCR and industry has warned Ofgem of the detrimental impact of the ongoing reforms on storage deployment.

The supporting model by Frontier does not include any changes in storage deployment, a key element to support the expansion of generation such as through increased offshore wind deployment and the increase in electricity demand such as through the electrification of vehicles. The assumption made by Ofgem that the loss of revenue from the TCR will be compensated by an increase in CM revenues lacks evidence. CM revenues for storage are at its lowest level, and de-rating factors of batteries continue to be lowered. The current unresolved suspension of the CM (which has been substantially prolonged compared to the original estimates of when this would be resolved) and the fact that new-build assets were precluded from participating in the T-1 auctions have impacted investment in flexibility. We urge Ofgem to review the impact of their reforms on storage with realistic assumptions of revenue generation from balancing services and the CM as well as with realistic assumptions for Battery Energy Storage Systems, balance of plant, installation costs and O&M costs.

Finally, the recent serious electricity outages and near outages over the past 3 to 4 months are clear evidence that the UK needs more fast reaction flexible asymmetric assets such as storage. TCR reforms, driven by the poor assumptions in the Frontier model do not give sufficient recognition to the benefits that new technologies and services can play in supporting the developing flexible decentralized electrical system and delivering the policy objectives of the Government and Ofgem - for example, by maintaining system stability or by reducing costs through increased flexibility.

CO_2 emission, Carbon Budgets and Air quality

There is no analysis or clear answer on how the reforms align with UK's carbon targets, the 4th and 5th Carbon Budgets or the 2050 UK's net Zero Target.

There is no doubt that a 5-year delay of renewable deployment will have a detrimental effect on air quality, environmental impact and CO_2 Targets. Frontier states that CO_2 emissions will significantly increase in the short term and will be 'marginally' larger in the long term.

'*The changes in renewable generation have a minimal direct impact on CO_2 emissions in* ***the long term*** *(relative to our previous TGR & BSUoS analysis),* ***though emissions are increased in the 2020s*** *as Offshore Wind deployment lags the assumed Solar/Onshore dropouts.'*

`*Increases in* ***CO_2 emissions in the longer term are marginally larger*** *than in our previous analysis.'*

We believe that these comments do not reflect the current situation in the UK where all political parties at local and national levels support more stringent CO^2 emissions targets. We urge Ofgem to consider the effect on consumers and the environment and include these considerations in their deliberations in order not to reach conclusions that are illegal and go against the law and government policy. The IPCC report on the impact of global warming presents the key findings relevant to the global warming of 1.5°C and 2°C. Bear in mind that, to achieve a 2°C scenario significant political changes need to occur. Failing to limit global warming at 1.5°C will have long-lasting and irreversible impacts such as loss of ecosystems and extinction, risks to health, livelihood, food security, water supply, human security and economic growth. Future climate-related risks will only be reduced by the upscaling and acceleration of far-reaching political objectives

Other reasons why the expected consumer benefits from Ofgem's preferred option might not materialise

Consumers benefit uncertainty vs adverse effects on carbon targets

Zenobē believes the prediction that consumers will end up saving an average of £2 or less a year on their energy bill is unreliable. Due to the uncertainty of the effects caused by the market, in addition to the questionable assumptions of the model (which is now dated), any final value for the effect on consumer cost would have a large margin of error. Such a small consumer benefit combined with a much larger uncertainty should not be used as reasoning behind such reform. With such a marginal financial advantage, the motivation for the reform must be to ensure that the new policy supports

- the aims of Ofgem, including protecting smaller consumers
- the aims of the government to build a more advanced and flexible system encouraging capital into new industries and services

- the aims and legal obligations of government to address climate change and pollution in urban areas, particularly through policies to support zero-emission public transport – itself protecting smaller and more financially vulnerable consumers

The current financial basis for the Ofgem proposals we believe does not reflect the existing situation and forecast situation in the electrical sector which has lead Ofgem to propose amendments in the TCR that will create more barriers to the penetration of renewables into the market and stifle the environment for the innovation required to introduce more efficient technologies.

Electricity cost competitiveness in comparison to other European nations

In Europe, many markets are more favourable to large energy consumers in order to protect industries. We are aware of numerous examples of industrial plants moving away from the UK due to the uncompetitiveness of the UK energy market. Production moving away from the UK reduces carbon generation by manufacturing in the UK, but the carbon footprint of such products is larger when they then need to be manufactured abroad and then imported back into the UK rather than manufactured locally. Such an effect on the manufacturing sector removes jobs further affecting the weakest in society and has materially negative impacts on the environment.

Impact on cost of capital due to the proposed changes by the Targeted Charging Review refined options

Zenobē strongly believes that the reforms would benefit substantially from robust evidence and data which seems to be absent from this and other consultations. Based upon Zenobē's practical experience of raising debt and equity capital, we strongly disagree with the assumptions for revenue and costs associated with storage upon which Ofgem has based some of the preliminary 'minded to' announcements. We would welcome the opportunity to discuss this issue and to provide evidence to address the model assumptions

The proposals that have been put forward act as a strong disincentive for consumers and other investors working with electricity consumers to invest in assets and mechanisms which reduce demand on the system at critical times. If the residual charges evolve in the preferred option direction then we believe it will create a hostile environment for the adoption of flexible solutions, new technologies, renewables and innovation. This is due to the significant reduction in income/ cost savings and therefore the lack of incentive to invest in these areas.

Low carbon technologies (including PV and storage) can smooth the demand curve, thus avoiding or delaying CAPEX until it is certain that further network reinforcement is required. This provides a flexible and modular (ie the size off the plants can be easily expanded, contracted or even moved) solution that can be replaced with line upgrades when it has been proven that the investment is needed. These technologies do, however, require CAPEX which will need to be supported by future incomes calculated on the basis of current ancillary service costs and payments. Changing these costs and payments could result in considerable loss of revenue for companies and impact their capital structures if they have used debt to fund their investments. Uncertainty in this area during the consultation process has already meant that investors would be unwilling to invest further in low-carbon technologies and services until the revenue sources, terms and amounts have become clearer. Zenobē is already seeing this from its customers and any delay in take up of the new technologies stands in opposition to the Government's ambitions in this policy area – in the case of storage this is particularly supported by the new Prime Minister.

Impact on government industrial strategy to support and develop the Smart Systems and Flexibility Plan

Within the consultation, Ofgem itself accepted the following negative impacts of its 'minded to decision':

On-site generation - Ofgem's 'minded to decision' will penalise users who adopted energy efficiency measures and those who invested in on-site generation solutions, including storage. Some firms may pay more, particularly if they have benefited from reduced contributions because of investing in on-site generation which has reduced their contribution to the existing system. Those that have not taken such action pay less. Within the small non-domestic segment, the lowest consuming users will pay more than currently.'
Load Disconnection – Industrial consumers who are currently playing an active role in managing their energy needs will potentially face an increase in charges level sufficient to justify a load disconnection. This will bring their contribution to the network charges to zero, increasing other users' charges. It is far more beneficial to the system to use incentives to encourage behaviour such as peak-shaving, rather than changes which might lead to sites disconnecting from the system.

Other sectors

Ofgem and Frontier do not consider the negative impact on other critical sectors such as transport. For example, the bus sector, where Zenobē is heavily involved through our innovative service offering, is not currently a large user of electricity. However, the government

and councils are legislating that the sector to adopt zero-emission vehicles at an increasing rate, and EVs are the principal vehicles being adopted ahead of other technologies. The proposed changes under the Ofgem reviews will substantially increase the cost of electricity and therefore the operation of the EVs. The increase in costs will have to be passed on to the consumers, generally lower-income consumers, in order to retain the viability of these buses. Furthermore, uncertainty about changes to the system has already severely curtailed current and medium-term investment in innovation and new technologies, which are pivotal in providing flexibility and innovation. We have already seen this through discussions that we are having with potential Commercial and Industrial customers.

Zenobē's key recommendations

- The implementation of the hybrid option (comprising a fixed charge for smaller users with agreed capacity charges (a charge per kW) for larger users).

- Ofgem to review their impact on storage deployment.

- We urge the regulator not to take any actions having adverse effects on the UK's zero-emissions targets.

We would welcome the opportunity to meet with you to discuss our concerns and proposed solutions in greater detail. In the meantime, if you or colleagues have any immediate queries regarding Zenobē's consultation response, please do not hesitate to contact us.

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