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Patrick Cassels,
Head of Electricity Network Access
FutureChargingandAccess@ofgem.gov.uk

25/08/2021

Dear Patrick

Access and Forward-looking Charges Significant Code Review: Consultation on Minded to Position

Energy Saving Trust is an independent organisation dedicated to promoting energy efficiency, low carbon transport and sustainable energy use to address the climate emergency.

A trusted, independent voice, we have over 25 years' sector experience. We provide leadership and expertise to deliver the benefits of achieving carbon reduction targets: warmer homes, cleaner air, healthier populations, a resilient economy and a stable climate.

Our work addresses the challenge of reaching net zero carbon emissions by 2050 by taking action to reduce energy consumption, install new infrastructure and accelerate a move to sustainable, low carbon lifestyles.

We empower householders to make better choices around home energy efficiency, low carbon transport and renewable energy generation.
We support businesses and community groups across the UK and internationally with strategy, research and assurance.

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We deliver transformative programmes on behalf of the UK, Scottish, Welsh and Northern Irish governments to support the transition to a low carbon society. We work with local authorities, providing support and advice to help them tailor their responses to the climate emergency. We enable everyone to play their part in building a sustainable future.

We welcome the opportunity to response to this consultation, we have focused our response on areas of most relevance to low carbon heating and renewable generation.

Question 3a: Do you agree with our proposals to remove the contribution to reinforcement for demand connections and reduce it for generation? Do you think there are any arguments for going further for generation under the current DUoS arrangements? Please explain why.

We agree with the proposal to remove the contribution to reinforcement for demand connections, this will be critical for helping the roll out of heat pumps across Great Britain as it will significantly increase incentives to install heat pumps.

We are pleased that Ofgem has recognised the important role that this will play in helping to decarbonise heat in homes. Heat pumps are a key technology that will enable the UK to decarbonise heating in time to meet the Net Zero targets that have been set by UK government. The Committee on Climate Change estimate that by 2028 there will need to be 600,000 heat pumps a year being installed in the UK. A significant number of these will need to be in existing homes. Customers connecting to distribution networks currently face an upfront charge made up of the cost of new assets needed to connect to the existing network, and a contribution towards the

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reinforcement of existing shared network assets. This approach was originally intended to provide a signal to customers to avoid constrained parts of the network where expensive reinforcement is required, this is no longer fit for purpose where there is now an urgent need to decarbonise heat at pace and scale.

We agree with Ofgem's analysis that these charges no longer act as an effective price signal for consumers, and instead will have the perverse impact of slowing down the roll out of low carbon technologies.

We agree that removing the contribution to reinforcement within the upfront connection charge for demand is a positive change that will incentivise the uptake of heat pumps. We also agree with reducing the contribution for generation. We recognise that this will come at a cost which will be socialised through DuoS, but we note that this cost should be viewed in combination with a) wider impacts of the Targeted Charging Review and b) Ofgem's RIIO-ED2 proposals (which are proposing to make headroom in DNO costs for net zero related expenditure). Both of these related proposals are likely to mean that overall domestic consumer bills would be lower despite the socialisation of some connection costs.

We are concerned that this signal may not in all circumstances incentivise the installation of heat pumps as the most effective and efficient form of electrical heating. Whilst we agree that individuals putting in modern direct electric or storage heating should not be charged, there is a possibility that property developers could meet the rule to only install 'low and zero emission heating' in new builds by installing in these heating systems at very low cost to them instead of putting in heat pumps. Heat pumps run at 300-400% efficiency and so have much lower impact on demand and on

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grid constraints than resistive heating. Because of this we think that Ofgem should consider where there is a housing development being built and connected to the grid, that some reinforcement costs should be paid if using direct electric or storage heating in homes and there is no technical justification for not using heat pumps.

Question 3c: What are your views on the effectiveness of the current arrangements in facilitating the efficient development and investment in distribution networks? How might this change under our proposals where network companies are required to fund more of this work?

We think that there is more Ofgem can do to use network charging to join up issues around current and future demand, local generation and economies and the transition to a low carbon energy system.

Current demand, projected future demand (electrification of transport and heat), and local generation.

The most efficient use of energy, minimising losses from transmission and distribution is where distributed generation is maximised to meet local demand. This should be the aim where possible, with an emphasis on embedding the benefits of construction and energy trading within local economies and enterprises. Through their DSO functions DNOs should be providing evidence to drive local balancing and strategic planning. They can do this by using available data to deliver the most efficient balancing between demand and distributed generation.

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At present the “best value” charging method is hampering development of rural business opportunities and creating an unlevel playing field for already disadvantaged regions. Grid constraints are exacerbating problems for generation opportunities, rural business development, and decarbonisation of both transport and heat.

In our view Ofgem should ask DSOs to analyse system level data and using this to drive investment decisions that should result in a more equitable solution. These can in turn deliver better consumer net zero related outcomes.

In our view these network upgrades should then be made as strategic investment by DNOs. This will free capacity for new generation to be connected, and the potential via storage or Active Network Management (ANM) to match new generation to demand. Any caps should be set based on actual capacity of the planned infrastructure based on forecast demand, and applied at a granular level (if necessary down to transformer level).

Local economies and the transition to a low carbon energy system:

Progress on enabling local balancing and trading of electricity has been slow, despite ground-breaking projects such as the Energy Local trial in Bethesda, North Wales demonstrating the ability to tackle local poverty and deliver sustainable generating businesses at local level.

The value of distributed generation to the wider market on a level playing field is not currently being recognised, and Ofgem should also be maximising support for distributed generation capacity. Trials such as project LEO in Oxfordshire are ongoing which aim to demonstrate this.

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Companies such as Octopus Energy have made significant and innovative offers to domestic consumers in allowing local renewable generation to contribute to lower bills (the The Fan Club, Ripple Co-Op). But it is important that Ofgem considers the wider distributive impacts of these innovations alongside its wider retail market reforms. Some solutions which might not be accessible or relevant to consumers (especially those in vulnerable situations) who may lack the time, knowledge or resources to take advantage of more sophisticated tariff structures. It is important that the benefits of such innovation are inclusive and can be accessed by as many consumers as possible.

Question 3e: What are your views on whether we should retain the High Cost Cap? Is there a case for reviewing its interaction with the voltage rule if customers no longer contribute to reinforcement at the voltage level above the point of connection?

Our understanding is that the High Cost Cap is to be set at £200kW, and for all costs above that level to be paid by the projects connecting to the network. We are concerned that the figure of £200 per kW could lead to perverse outcomes.

We have undertaken a detailed analysis exercise for viability of distributed generation projects over the past 12 months, based on detailed and carefully examined capital and development cost assumptions, and giving us capability to sensitivity test for the affordability of grid connection costs.

We would be happy to share findings in detail across wind and solar technologies with Ofgem.

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With respect to grid costs, our summary findings are that a solar farm being installed at a scale of 5MW or above will be built for a total construction cost (excluding grid) in the region of £450-550/kWp. We can then be reasonably sure, based on the lack of feed in tariff and historical installation prices, that we would need the grid costs to be within a range of £50-100/kW to be viable, if there is no chance of significant electricity sales to 3rd parties above the market wholesale rate.

Our work included an Excel model to demonstrate project viability across a range of scales. Two example sensitivity output tables for solar pv are shown below, where text in the boxes shows the predicted debt service cover of a project, rated red at below 1% Debt Service Cover Ratio.

The grid cost fed into this example is £200/kW: In this scenario there are very few viable projects.

Base installed cost per kWp (£)			50KW	100kW	250kW	500kW	1MW	1.5MW	2MW	3MW	4MW	5MW	10MW	15MW	20MW	30MW	40MW	50MW
	£ 650	GROUND MOUNT	0.75	0.77	0.62	0.66	0.67	0.68	0.70	0.70	0.71	0.69	0.70	0.70	0.70	0.70	0.70	0.70
	£ 640		0.76	0.78	0.63	0.66	0.68	0.69	0.70	0.71	0.71	0.70	0.71	0.71	0.70	0.71	0.71	0.71
	£ 630		0.77	0.78	0.63	0.67	0.69	0.70	0.71	0.72	0.72	0.71	0.72	0.72	0.71	0.71	0.72	0.72
	£ 620		0.78	0.79	0.64	0.68	0.70	0.70	0.72	0.73	0.73	0.72	0.73	0.73	0.72	0.72	0.72	0.72
	£ 610		0.79	0.80	0.65	0.69	0.70	0.71	0.73	0.73	0.74	0.73	0.74	0.73	0.73	0.73	0.73	0.73
	£ 600		0.79	0.81	0.65	0.69	0.71	0.72	0.74	0.74	0.75	0.74	0.75	0.74	0.74	0.74	0.74	0.74
	£ 590		0.80	0.82	0.66	0.70	0.72	0.73	0.74	0.75	0.76	0.74	0.76	0.75	0.75	0.75	0.75	0.75
	£ 580		0.82	0.83	0.67	0.71	0.73	0.74	0.75	0.76	0.77	0.75	0.76	0.76	0.76	0.76	0.76	0.76
	£ 570		0.83	0.85	0.68	0.72	0.74	0.75	0.76	0.77	0.78	0.76	0.77	0.77	0.77	0.77	0.77	0.77
	£ 560		0.84	0.86	0.68	0.73	0.75	0.76	0.77	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78	0.78
	£ 550		0.85	0.87	0.69	0.73	0.76	0.77	0.78	0.79	0.79	0.78	0.79	0.79	0.79	0.79	0.79	0.79
	£ 540		0.86	0.88	0.70	0.74	0.76	0.78	0.79	0.80	0.81	0.79	0.80	0.80	0.80	0.80	0.80	0.80
	£ 530		0.87	0.89	0.71	0.75	0.77	0.79	0.80	0.81	0.82	0.80	0.82	0.81	0.81	0.81	0.81	0.81
	£ 520		0.88	0.90	0.72	0.76	0.78	0.80	0.81	0.82	0.83	0.81	0.83	0.82	0.82	0.82	0.82	0.82
	£ 510		0.90	0.92	0.73	0.77	0.79	0.81	0.82	0.83	0.84	0.83	0.84	0.84	0.83	0.83	0.83	0.83
	£ 500		0.91	0.93	0.73	0.78	0.80	0.82	0.83	0.84	0.85	0.84	0.85	0.85	0.84	0.85	0.85	0.85
	£ 490		0.92	0.94	0.74	0.79	0.82	0.83	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.86	0.86
	£ 480		0.94	0.96	0.75	0.80	0.83	0.84	0.86	0.87	0.87	0.86	0.87	0.87	0.87	0.87	0.87	0.87
	£ 470		0.95	0.97	0.76	0.81	0.84	0.85	0.87	0.88	0.88	0.87	0.89	0.88	0.88	0.88	0.88	0.88
	£ 460		0.96	0.99	0.77	0.82	0.85	0.86	0.88	0.89	0.90	0.88	0.90	0.90	0.89	0.90	0.90	0.90
	£ 450		0.98	1.00	0.78	0.84	0.86	0.87	0.89	0.90	0.91	0.90	0.91	0.91	0.91	0.91	0.91	0.91
	£ 440		0.99	1.02	0.79	0.85	0.87	0.89	0.91	0.92	0.92	0.91	0.93	0.92	0.92	0.92	0.92	0.92
	£ 430		1.01	1.03	0.80	0.86	0.89	0.90	0.92	0.93	0.94	0.92	0.94	0.94	0.93	0.94	0.94	0.94
	£ 420		1.03	1.05	0.81	0.87	0.90	0.91	0.93	0.95	0.95	0.94	0.96	0.95	0.95	0.95	0.95	0.95
	£ 410		1.04	1.07	0.82	0.88	0.91	0.93	0.95	0.96	0.97	0.95	0.97	0.97	0.97	0.97	0.97	0.97
	£ 400		1.06	1.09	0.84	0.90	0.93	0.94	0.96	0.97	0.98	0.97	0.99	0.98	0.98	0.98	0.98	0.99

Likely build cost

The grid cost fed into this example is £50/kW: This level enables more projects.

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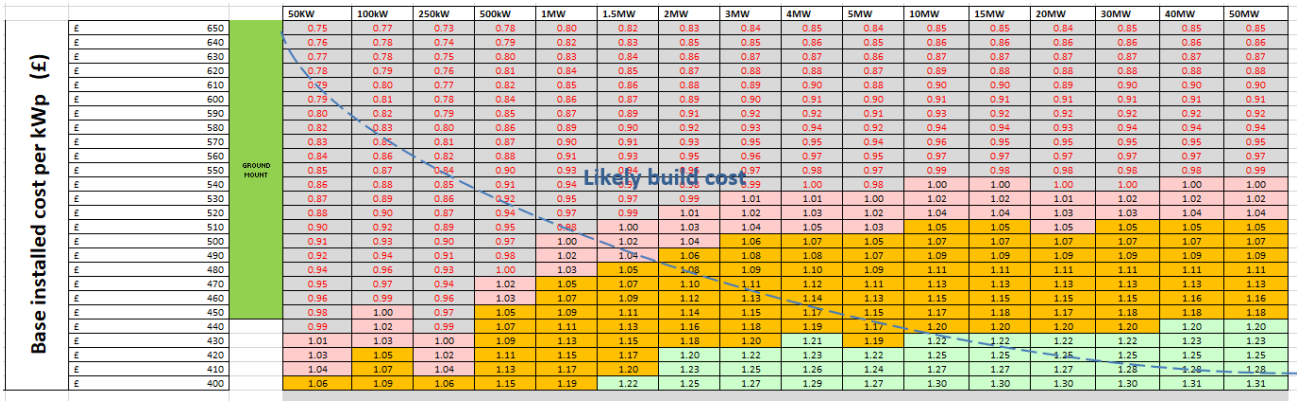

	50KW	100kW	250kW	500kW	1MW	1.5MW	2MW	3MW	4MW	5MW	10MW	15MW	20MW	30MW	40MW	50MW
£ 650	0.75	0.77	0.73	0.78	0.80	0.82	0.83	0.84	0.85	0.84	0.85	0.85	0.84	0.85	0.85	0.85
£ 640	0.76	0.78	0.74	0.79	0.82	0.83	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.86	0.86
£ 630	0.77	0.78	0.75	0.80	0.83	0.84	0.86	0.87	0.87	0.86	0.87	0.87	0.87	0.87	0.87	0.87
£ 620	0.78	0.79	0.76	0.81	0.84	0.85	0.87	0.88	0.88	0.87	0.89	0.88	0.88	0.88	0.88	0.88
£ 610	0.79	0.80	0.77	0.82	0.85	0.86	0.88	0.89	0.90	0.88	0.90	0.90	0.89	0.90	0.90	0.90
£ 600	0.79	0.81	0.78	0.84	0.86	0.87	0.89	0.90	0.91	0.90	0.91	0.91	0.91	0.91	0.91	0.91
£ 590	0.80	0.82	0.79	0.85	0.87	0.89	0.91	0.92	0.92	0.91	0.93	0.92	0.92	0.92	0.92	0.92
£ 580	0.82	0.83	0.80	0.86	0.89	0.90	0.92	0.93	0.94	0.92	0.94	0.94	0.93	0.94	0.94	0.94
£ 570	0.83	0.85	0.81	0.87	0.90	0.91	0.93	0.95	0.95	0.94	0.96	0.95	0.95	0.95	0.95	0.95
£ 560	0.84	0.86	0.82	0.88	0.91	0.93	0.95	0.96	0.97	0.95	0.97	0.97	0.97	0.97	0.97	0.97
£ 550	0.85	0.87	0.84	0.90	0.93	0.95	0.97	0.97	0.98	0.97	0.99	0.98	0.98	0.98	0.98	0.99
£ 540	0.86	0.88	0.85	0.91	0.94	0.96	0.98	0.99	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
£ 530	0.87	0.89	0.86	0.92	0.95	0.97	0.99	1.01	1.01	1.00	1.02	1.02	1.01	1.02	1.02	1.02
£ 520	0.88	0.90	0.87	0.94	0.97	0.99	1.01	1.02	1.03	1.02	1.04	1.04	1.03	1.03	1.04	1.04
£ 510	0.90	0.92	0.89	0.95	0.98	1.00	1.03	1.04	1.05	1.03	1.05	1.05	1.05	1.05	1.05	1.05
£ 500	0.91	0.93	0.90	0.97	1.00	1.02	1.04	1.06	1.07	1.05	1.07	1.07	1.07	1.07	1.07	1.07
£ 490	0.92	0.94	0.91	0.98	1.02	1.04	1.06	1.08	1.08	1.07	1.09	1.09	1.09	1.09	1.09	1.09
£ 480	0.94	0.96	0.93	1.00	1.03	1.05	1.08	1.09	1.10	1.09	1.11	1.11	1.11	1.11	1.11	1.11
£ 470	0.95	0.97	0.94	1.02	1.05	1.07	1.10	1.11	1.12	1.11	1.13	1.13	1.13	1.13	1.13	1.13
£ 460	0.96	0.99	0.96	1.03	1.07	1.09	1.12	1.13	1.14	1.13	1.15	1.15	1.15	1.15	1.16	1.16
£ 450	0.98	1.00	0.97	1.05	1.09	1.11	1.14	1.15	1.17	1.15	1.17	1.18	1.17	1.18	1.18	1.18
£ 440	0.99	1.02	0.99	1.07	1.11	1.13	1.16	1.18	1.19	1.17	1.20	1.20	1.20	1.20	1.20	1.20
£ 430	1.01	1.03	1.00	1.09	1.13	1.15	1.18	1.20	1.21	1.19	1.22	1.22	1.22	1.22	1.23	1.23
£ 420	1.03	1.05	1.02	1.11	1.15	1.17	1.20	1.22	1.23	1.22	1.25	1.25	1.25	1.25	1.25	1.25
£ 410	1.04	1.07	1.04	1.13	1.17	1.20	1.23	1.25	1.26	1.24	1.27	1.27	1.27	1.28	1.28	1.28
£ 400	1.06	1.09	1.06	1.15	1.19	1.22	1.25	1.27	1.29	1.27	1.30	1.30	1.30	1.30	1.31	1.31

Below are some example grid connection costs we have seen for projects in the last year.

- Project 1 (£2m for 25MWexport) = £80/kW
- Project 2 (£3m for 9MW export) = £300/kW
- Project 3 (£4.5m for 7.5MW export) = £600/kW
- Project 4 (£5m for 5MW export) = £1,000/kW
- Project 5 (£10m for 70MW) = £142/kW
- Project 6 (£10m for 10MW)= £1,000/kW
- Project 7 (£20m for 20MW) = £1,000/kW

Projects at these scales have significant potential for local and statutory bodies in Wales seeking the best sites for location of solar and wind technology. The map below demonstrates the significant grid constraints located projects in many areas where the resource availability is good. At costs above the level of our findings, new onshore generation will be unable to capitalize. This risks disincentivising a large number of onshore wind projects that could significantly contribute to decarbonisation of the grid.

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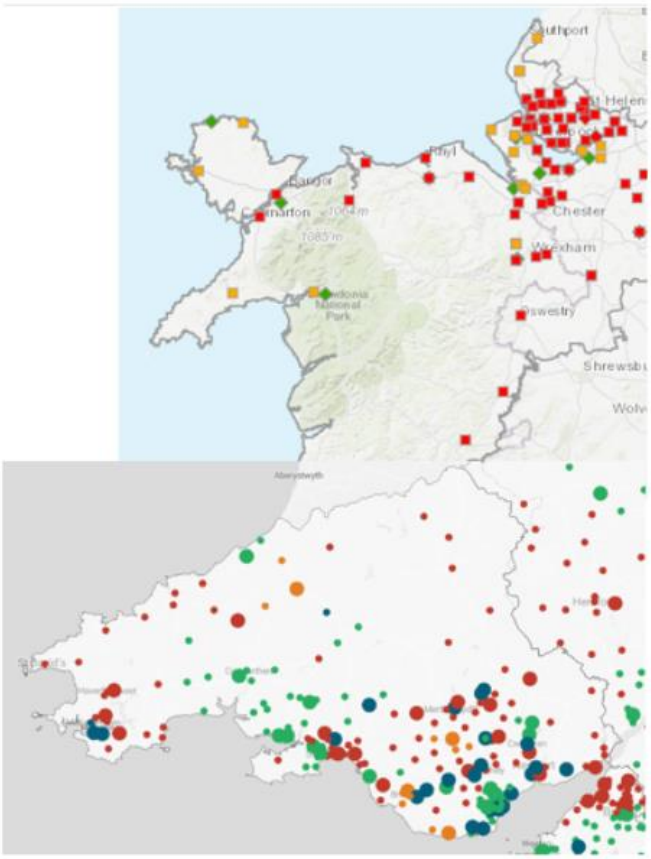

Fig 1: Combined map of the WPD and SPEN delivery areas showing traffic light coded connection points for renewable generation, where red is problematic and green shows some capacity

We recommend that DNOs though their DSO function can develop a better understanding of the capacity for generation implied by current and projected demand, and the relationship between that capacity and the location and potential for onshore renewable generation resource. This would lead to a better understanding of the financial viability implications for projects seeking to connect in constrained

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locations. We think Ofgem should consider whether projects that contribute significantly to net zero can contribute financially towards required infrastructure on the basis of affordability and viability rather than on a one size fits all figure per kW.

Question 4c: Can you identify any benefits to shared access rights that we have not considered, which could impact likely take-up?

We think that better defined access fits with the benefits of better use of demand data (existing and forecasted) in order to match to potential distributed generation.

We agree with the proposals to offer Active Network Management with level of firmness and compensation arrangements. We note that the best analysis of data will lead to the least need for compensation payments to be incurred, and that compensation requirements may incentivise pessimistic constrained access offers as well as better data management

We agree with the introduction of time-profiled access noting that this offers a clear market signal and predictability of a value proposition for storage or export limitation on any particular project.

We are disappointed that shared access is not included as a low regrets measure with potential to secure benefits. We see the potential opportunities as follows:

- We are looking at a number of projects with potential to add solar pv to existing wind farm projects, and where work needs to be done to establish clarity around the grid connection requirements and maximise the opportunity to use infrastructure and resource to full effect.

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- Grid assets associated with end of life wind turbine projects may present significant opportunities for local ownership and collaboration with other local projects.
- Shared access in a system where the relationship between supply and demand is better managed at distribution level will continue to offer added benefits.

We would be happy to discuss any of the content of our response to you in more detail.

Yours sincerely

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