

# Call for Input: Future of local energy institutions & governance

## Cover Letter & Executive Summary

Dear Victoria,

We welcome Ofgem's initiative on this Call for Input, and the recognition that flexibility markets, particularly at a local level, have:

1. Huge potential to lower the cost to consumers of delivering a wind- and solar-based Net Zero energy systems; and
2. So far failed to scale to anything close to their full potential within today's available trading opportunities

Electron is a London-based energy technology company. We deliver trading software for flexibility markets. Our platform allows network utilities, renewable generators and flexible energy users to optimise their use of network capacity and renewable power based on time and location.

As such, we are in favour of framework model option 4, as set out on page 33, with flavours of model 1. High level reasons being:

- 1) A world in which "everyone does what they are best at" requires the least regulatory intervention, enables value to be unlocked by those most incentivised to do so, and provides the most fertile ground for innovation and digital adoption. This is key because the types of flexibility markets required at 30% wind + solar generation will differ hugely from those required at 50% and 80%, and the flexible market participants will likely look very different too.
- 2) We believe that DNOs are best placed make the trade-off between total network capacity and reliability, and already have the skillsets and incentives in place to purchase network upgrade deferral / avoidance flexibility products. The fact that these markets are not yet more valuable can be explained by the fact that i) insufficient value in being attributed to current DSO products to encourage more flexibility to come to market; and ii) as a result, DSOs are encountering insufficient ready liquidity to rely on non-network solutions in many instances. This problem is rationally overcome by enabling new flexibility products to come to market and increase liquidity under model 4.
- 3) Regional System Planners/ Operators are well placed, and have the democratic mandate, to make the trade-offs with regards to how current and future network capacity is allocated within their regions. As mentioned, they also have cross vector jurisdiction. However, selecting model 3 alone would create substantial new challenges in determining accountability for making sure local plans are good value and deliverable. What would really enable these organisations to deliver regional value within the guardrails of value and deliverability that already exist under RII02 would be the ability to allocate local network capacity in a more dynamic way. See the below for what is missing today to enable this to happen.
- 4) Although "bottom-up" markets have been broadly excluded from this call for input, a world that would enable curtailed renewable generators to dynamically purchase additional local network capacity would bring a huge new pool of value and flexibility to market- this is particularly true at a distribution level today, where asset operators are not refunded for curtailment. But the same method might be used to enable transmission connected generators to connect faster and

see, perhaps temporarily, similar regional flexible demand. You might also consider a future in which large energy users like data centres and vertical farms could seed their own local flexibility markets in the opposite direction (and co-locate with excess generation). This requires software solutions and clarification of access rights. It does not require a new central authority. Also see point below on coordination.

- 5) It is unclear to us how an IDSO is any better placed to bring the new flexibility and markets, implied in points 3 and 4 above, into being. **Dynamic network capacity and access rights are among the key missing markets today, and this is not likely to diminish as networks become more variable, and electrification of heat and transport ramp up.** Dynamic network capacity and access rights are inherently middle-down and bottom-up markets. We are unconvinced that the creation of a new central entity is required, or even able, to solve the coordination challenge. See the note on coordination below in this cover letter. Moreover the uncertainty that will result from such a change risks further stagnation in value creation at the worst possible time with energy prices, renewable curtailment and the need for domestic energy resource at all-time highs.
- 6) Any future SO would greatly benefit from unlocking new flexibility in middle-down and bottom-up flexibility markets.

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Today there are some missing incentives, derogations and digital capabilities that would enable model 4, these are set out in order below, with the first two being vital and the second two being accelerants.

The first, and perhaps the most immediately important, is **a missing set of incentives for DNOs to increase the utilisation of their network on a dynamic basis.** However, this would already add value to the operators of curtailed renewable generators, distributed energy resources stuck in connection queues; local authorities wishing to electrify faster; and energy intensive industries. These incentives could be introduced to DNOs/ DSOs in RIIO-2, perhaps through ODI or uncertainty mechanisms. The delivery of value here would need to be measurable against a counterfactual of no network access at that time and no value creation (i.e., inability to export renewable power or inability to sell power at a charging station).

**The second is a set of derogations, or decentralisation of obligations.** Energy Systems Catapult published a thought piece entitled “Rethinking Electricity Markets” in March 2021 that considered this approach to generation capacity markets. The same approach would be highly valuable for network capacity markets, facilitated by clarity on access rights from DNOs. For example, energy producers and users are already incentivised to optimise their use of the network where this reduces their costs or increases their revenue. Additional clarity from DNOs on head room and network capacity rights on the demand side would enable local authorities or businesses to allocate that demand while creating new flexible capability at a local level. Communities (used loosely here to imply aggregated sets of local loads, whether domestic or industrial) could also be incentivised to coordinate in order to optimise their net import or export. This is heavily in support of model 4, but will should also appease model 3 enthusiasts.

**The third is the hardware investment to make the maximum number of flexible resources dispatchable.** The main missing issue we have encountered in bringing new flexibility to market is the upfront cost that larger asset operators would have to invest

in flexible control systems. Although the price of this equipment will drop as it is more widely adopted (in accordance with Moore's law), there remains a chicken and egg problem. The owners of \*potentially\* flexible assets are unwilling to invest the money in this capability until they can see commensurate revenue opportunities in dynamic flexibility markets, and the dynamic markets do yet exist due to a perceived lack of near-term liquidity. We have heard recent discussions of a CfD type approach being taken to pay these assets some of the modelled system costs that their flexibility costs unlock. Divorcing these calculations from direct value capture is very dangerous and risks dampening real price signals from value accretive network actions. An alternative approach might resemble the student loan repayment scheme. The decision to invest in asset control capabilities, ahead of sufficient trading opportunity, could be de-risked with upfront credit support which would become repayable as flexibility revenues scaled.

**The fourth is missing enabling digital tools/ capabilities.** NZIP is currently addressing some of these, such as central asset registers, through innovation funding. Others are being built up with Energy Data Taskforce and work on open data standards (though we would heavily urge for any work on data to be paired directly with specific consideration of the mechanisms to unlock the value of that data, such as the network access rights markets outlined above). What we see as fundamentally missing though are common forecasting capabilities. The reason these are so important is because we see the majority of value of these early markets heading towards day ahead markets in the medium term, before nearer real term solutions are understood and trusted. Therefore, it is important for traders to have a better understanding of the counterfactual that they are optimising against. Although many private companies have commercially available solutions for forecasting, the lack of opportunity to monetise dynamic network allocation in local markets means that they will not be ready to pay for these today.

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We also want to draw out two important overlaps with ongoing system restructuring initiatives, namely SCR & Nodal Pricing.

### **SCR obligations**

As drafted, require DNOs to guarantee maximum curtailment volumes in the short term and zero curtailment dates in the medium to long term. We understand that this approach has been taken to bring certainty to investors of new clean energy assets, such as electric vehicle charging stations. However, at surface level this decision seems at odds with the direction of travel for a predominantly variable generation mix. In sunny and windy areas, it is already economically rational build more generation than network capacity. Connection arrangements that seek to guarantee 100% export risk dampening the incentives to collocate flexible industry with these resources. Vertical farming is just one example of a low carbon industry whose unit economics would be transformed by access to occasionally abundant clean power at a local level. Making sure that SCR implementation does not dampen incentives to optimise use of renewable energy and network capacity locally is key to unlocking the virtuous circle of bringing more flexible demand to windy and sunny regions, and in turn encouraging more domestic wind and solar capacity to attract investment.

### **Nodal Pricing**

This is being discussed as a top-down way to unlock some of this locational value, however the efficacy of such a solution is heavily dependent on how local these signals get and how much liquidity can be created at each node. Two upfront challenges on this

are a) much of the demand congestion is going to happen at an extremely local level as we electrify heat and transport; and b) the level of granularity of pricing behind nodes is going to vary hugely depending on network headroom, weather resource and local grid topology (rural vs urban vs industrial etc). All this would imply that it is vital to incentivise and scale dynamic, local flexibility markets, as set out above, ahead of taking any decisions on how such nodal pricing might be structured and how deep it should push into low voltage networks.

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Before we answer your specific questions, we want to comment on the theme of **inter-market coordination** running throughout this Call for Input.

There seems to be an implicit assumption under the IDSO model that coordination will be most easily accomplished under a single public entity. This worries us. We agree that coordination is key to maximising the value of flexibility markets. But the first priority should be in enabling dynamic local flexibility markets to capture new value and thus grow the over-all pool of responsive flexible assets to be coordinated between markets.

Our experience of delivering local flexibility markets, and in particular a curtailment market in Orkney, is that the greatest inhibitor to coordination is a misalignment on market timings. If flexible assets are able to make price-based decisions in the same time frame as to where their capabilities are most economically deployed, then market solutions are extremely effective in allocating resource economically.

This approach has other benefits:

- Regulation can require interoperability of platforms and flexibility products. If product requirements are compatible, platforms can coordinate on a more dynamic and transparent basis than institutions can.
- If platforms can make visible the non-rival components of different flexibility products (such as national balancing and local network congestion) then it is in the economic interest of both the platform; its traders; and the purchasers of those flexibility products to push towards trade “stack-ability”
- The simplicity that you acknowledge to be required from whatever solution is chosen can be managed by platforms
- If any one, private flexibility platform became so successful that all flexibility markets were concentrated in one place, that platform could be regulated. However, for that to transpire, a huge volume of new flexibility would already have been unlocked by that platforms success, the achievement of which would be in the interest of consumers and Net Zero alike.
- Should model 4 be selected, you would already have created an environment in which multiple platform solutions would be allowed to flourish since there would be many different customers for solutions, with different priorities and capabilities. Competition between these platforms is likely to deliver far more value to both users and end consumers alike vs top-down regulation.

We thank you for the opportunity to provide input into the structure and governance of local energy institutions and marketplaces and would very happy to input further on any follow up questions/ clarifications on the above.

Yours sincerely,  
Joanna Hubbard

## Specific Questions Responses

- 1. Are the three energy system functions we outline (energy system planning, market facilitation of flexible resources and real time operation of local energy networks) the ones we should be focusing on to address the energy system changes we outline?**

Yes, we agree with the three functions outlined.

However, we would encourage a broader view of “market facilitation” to be taken, over and above access to network markets alone. You say “peer to peer markets” are out of scope, however peer to peer is often conflated with financial transactions of green power. Other peer to peer markets exist, such as the continuous optimisation of local network capacity/ access rights. Since these market types affect and support all three functions under focus it is detrimental to exclude it from the scope of this CFI. Moreover, these markets are ready to create value today and capable of providing much needed locational price signals across an increasingly flexible, variable, distributed energy asset base.

We would also propose to include scope for digitalisation in the above roster. All these functions will be supported by robust, accessible, continuous data on network capacity, utilisation, connected assets, future connection requests etc. Considering these data sets in separate consultations and workstreams risks leading to inappropriate formats, granularity, access arrangements etc. Data considerations must be paired with use cases for that data.

- 2. Do you agree with the criteria we have set out for assessing the effectiveness of institutional and governance arrangements?**

All five criteria (Accountability, Credibility, Competence, Coordination, Simplicity) are important.

However, we would point out that they are not easy to measure, and many of these could be performed and signed off in a mandated, “box ticking” manner. The delivery of the functions above is complex, new and, as you recognise, highly valuable. We would like to see the deliverers not just mandated but also highly incentivised to maximise consumer value.

You say, *“In order to be confident these energy system functions will be delivered effectively, we need the right institutions to own them, and the right governance arrangements in place to support them.”*

This is correct, but governance is only important when there is something to govern in the first place. The establishment of markets and real time operation should be prioritised.

These markets will have the additional benefit of providing a clearer framework to measure success (for example number of markets in operation, £ saved, NPS/customer feedback, flex asset participation) and introduce a collaboration metric.

Making sure that responsible parties are able to earn money from out-performance on the above metrics will likely drive Credibility and Competence.

- 3. Do you agree with our assessment of how far the current institutional arrangements are, or are not, well suited to deliver the three key energy system functions?**

Broadly, we agree with this sections assessment, and the clarity of issue identification is welcome.



We would like to add the following comments to the sections set out below:

Section 3.9 sits under “Energy Systems Planning”, but this arguably is even more applicable to “Market facilitation” when you suggest the “need to consider whether existing arrangements provide DNOs with sufficient incentives to make efficient trade-offs between asset and non-asset-based solutions”

Since the core function of a network operator is to provide cost efficient network capacity, the DNO is required to make the trade-off between network reliability and capacity on the basis of network planning and setting operating parameters. However, with these parameters set, the DNO is not required to allocate local network access in a more dynamic way within these parameters. These could be, for example:

- A local authority might wish to reallocate demand capacity amongst their local infrastructure assets. For example, they might wish to connect a bank of EV charging stations ahead of a network upgrade, on the basis that they can make sure they are only energised when their electric bus fleet is not charging; or
- A curtailed renewable generator, losing revenue, might wish to pay another local generator not to export power, or local demand assets to import power at that moment and create more space on the local network to release this curtailment.
- A business in an industrial park may wish to increase their demand, temporarily, while another business agrees to offset this increase with a commensurate decrease in grid utilisation.

All of the three network optimisation market examples above create additional value for generators, consumers and local communities alike. The existence of these markets would also support local carbon objectives and seed additional liquidity into DNO network upgrade deferral markets.

All three need network data and guidelines to be facilitated but could be operated by a third party.

Network operators should be more heavily incentivised to facilitate these markets. For example, they could receive a portion of the additional value created by doing so. This value would be easily quantified on market platforms and would go much of the way to incentivise “non-(network)-asset based solutions”

Section 3.14: The focus should be on creating an environment in which the right economic actors are making the right decisions – and that means the people that are making investments. So, any structure that puts flexible assets at the bottom of the heap will not be able to do that

Section 3.15: Market facilitation of flexible resources. This section takes a very narrow view of markets and excludes (for example) the options mentioned above in this answer. In doing so, this section makes a few assumptions that should not be taken as a given.

3.16: *“As we transition to net zero, the growth of these markets [referring to procured flexibility by DNOs] may be hindered if DNOs continue to perform the market facilitation role as they currently do. It would require a step-change in their expertise in market design and operation, areas in which others already have significant experience (for example the ESO)”*

Our experience of delivering local flexibility markets suggests that **technical knowledge isn't the important barrier**. Little market design and expertise is needed to support these static procurement models, as this isn't complex. There are also software solutions available and market experts that DSO can liaise with so that expertise is not required inhouse.

However, **creating liquidity is more difficult**. This will be a problem whoever sets up the market. The ESO or FSO will potentially have even more difficulties than the DSO as they are not used to dealing with smaller, lower voltage assets. This is the key rationale for the need to create markets and optimise use of renewable power or network assets at the right level of the grid, putting the needs of the energy asset investors and operators first (Model 4).

3.17 – Amongst the renewable generators/ flexible asset operators we speak to, trust is not missing because of the potential DNO/DSO conflict. **Trust is missing because asset owners want to know that, if they invest in the hardware to participate in markets, that the market will 1) be worth it financially 2) that it will exist in the future.**

3.18 – As set out in our cover letter, this is not so much a platform coordination: software solutions are already available to enable market collaboration today. The key blocker is in the coordination of existing flexibility product design and time frames. This can be managed simply with regulatory obligations to align to maximise liquidity. Moreover, this aligns incentives of all market participants to coordinate in order to maximise liquidity and overall system value.

3.19 - For large assets, this can be easily overcome. At Electron, we engage with lots of asset owners on barriers to market participation and this is not regarded as a barrier by large asset owners/investors. The most widely discussed barriers are around market participation value and lifespan of the markets.

Please refer also to our cover letter comment on incentivising potentially flexible assets to invest in control hardware in advance of all viable trading in scaled up flexibility markets.

#### **4. Overall, what do you consider the biggest blocker to the realisation of effective energy system planning and operation at sub-national level?**

Energy system planning today lacks coordination – the biggest blocker here being a lack of aligned incentives for local actors to maximise utility of renewables and network capacity that is already installed and in planning.

Different priorities and mandates make reaching consensus difficult and, in some cases, leads to wasted and counteracted effort which is well illustrated in the example provided in 3.11.

Local authorities wishing to electrify faster, operators of curtailed renewable generators, distributed energy resources stuck in connection queues; and other energy intensive industries are already incentivised to optimise their use of network capacity in order to connect value faster and earn more revenue.

**What is missing is a new DNO incentive to enable local actors to increase the utilisation of networks on a dynamic basis.** These incentives could be introduced to DNOs/ DSOs in RIIO-2, perhaps through ODI or uncertainty mechanisms. The delivery of value here would need to be measurable against a counterfactual of no network access at that time and no value creation (i.e., inability to export renewable power or inability to sell power at a charging station). As an example, DNOs could be paid a % of the new generation of demand-servicing that their market facilitation unlocks

Another missing piece is a set of derogations, or decentralisation of obligations that would enable local actors to pay for and scale these markets themselves, within appropriate, pre-determined operational boundaries e.g., additional clarity from DNOs on head room and network capacity rights on the demand side would enable local authorities or businesses to allocate that demand while creating new flexible capability at a local level. It is already in Ofgem's control to mandate this.

We mention two other digital capabilities in our cover letter that could be introduced to increase the speed of scaling flexibility market participation.

#### **5. Do you agree with the opportunities of change we outline and the potential benefits they may create?**

Yes, particularly with 'Synergy 5'. Operational decisions need to take into account and be coordinated with actions taken on flexibility markets at all levels, including at distribution and national level.

**6. Are there additional opportunities for change and benefits that we have not set out?**

We agree with the opportunities for change you set out, but we believe that there are more benefits that should be considered. Specifically:

- 1) Public access to real-time operational network data could enable new “asset to asset” flexibility markets facilitated by DSO data and DSO operational guard-rails. This in turn creates more revenue opportunities for flexible resources and drives the adoption of more DERs. Such bottom-up market approaches could be created with fewer resources from the DSOs, but with full collaboration / visibility of information. This approach would also result in more liquidity for current and future DSO and FSO flexibility markets.
- 2) Driving liquidity in local flexibility markets in two parts, the first of which seems to be missing from current consideration and discussions:
  - a. De-risking the control hardware that potentially flexible resources need to make ahead of having fully scaled up flexibility markets in which to recoup this investment. We suggest a student loan type repayment scheme here to help seed this market but make sure that all consumers directly benefit from the resulting liquidity and not only those who can afford flexible assets today.
  - b. Better collaboration on software and hardware standards for flexible assets
- 3) Creating new digital tools to enable these markets. NZIP seems to have some of these covered, for example automated asset registration for better DER visibility. However, the crucial missing tool that we see today is forecasting capability to support flexible assets in their trading decisions. While these tools are commercially available today, again they will not be adopted before sufficient trading opportunities exist to justify that trading spend.

**7. We set out a number of risks associated with change. Do you agree with these risks and the potential costs they create? Are there additional risks of change and costs that have not been set out?**

Yes, particularly with 3.33 - while the split of DNO/DSO roles could probably help resolving some of the challenges we are facing today, the change is likely to be costly, complex, time-consuming and, likely, disruptive. An alternative approach would be to introduce sufficient incentives to help DNOs make efficient trade-offs.

**8. For each model, we have set out the key assumptions which need to be true for the model to offer the right solution. Which of these assumptions do you agree with?**

Broadly yes, we do see an inextricable link between the three functions mentioned- this means that there will always be a market facilitation role for a network operator, but a successful model will see them facilitating these markets only and enabling end users of the network (local authorities, communities, businesses and DERs themselves) to drive value in optimising local utilisation of renewables and network capacity.

Although many bottom-up drivers are explicitly called out, the overall ideas and frameworks presented in this Call for Input are very top down. Success is about the networks facilitating more renewables/DERs coming on to the network. That means creating network capacity to support that, either by building, connections or markets. So, we would also urge you to consider that this is about creating a facilitative environment to support end users to make flexible investments.

Multiple, nested trading opportunities are a way to plug at least some of the gaps in existing market value capture (which you allude) by creating price signals. These are easily coordinated across platforms with appropriate trading windows.

The priority should be not creating an environment where that's less likely to happen, for example by big, top-down and centralised processes.



**9. Out of the framework models we have developed which, if any, offer the most advantages compared to the status quo? If you believe there is another, better model please propose it.**

We feel that all options would work but the fastest route to success is via model 1 transitioning to model 4.

The primary driver for starting with model 1 is that significant changes to the status quo will likely be time-consuming and difficult to implement. Speed should be an important consideration for delivering net zero.

Beyond that we believe that model 4 is set to deliver maximum value to clean energy assets and consumers alike, by enabling markets to efficiently allocate resources across a complex system (the following in this answer is a direct repeat of our cover letter summary):

- a) A world in which “everyone does what they are best at” requires the least medium-term regulatory intervention; enables value to be unlocked by those most incentivised to do so; and provides the most fertile ground for innovation and digital adoption. This is key because the types of flexibility markets required at 30% wind + solar generation will differ hugely from those required at 50% and 80%, and the flexible market participants will likely look very different too.
- b) DNOs are still best placed make the trade-off between total network capacity and reliability, and already have the skillsets and incentives in place to purchase network upgrade deferral / avoidance flexibility products. The fact that these markets are not yet more valuable can be explained by the fact that i) insufficient value is being attributed to current DSO products to encourage more flexibility to come to market; and ii) as a result, DSOs are encountering insufficient ready liquidity to rely on non-network solutions in many instances. This problem is rationally overcome by enabling flexibility products to come to market and increase liquidity under model 4.
- c) Regional System Planners/ Operators are well placed, and have a democratic mandate, to make the trade-offs with regards to how current and future network capacity is allocated within their regions. As mentioned, they also have cross vector jurisdiction. However, selecting model 3 alone would create substantial new challenges in determining accountability for making sure local plans are good value and deliverable. What would really enable these organisations to deliver regional value within the guardrails of value and deliverability that already exist under RIIO2 would be the ability to allocate local network capacity in a more dynamic way. See the below for what is missing today to enable this to happen.
- d) Although “bottom-up” markets have been broadly excluded from this consideration, a world that would enable renewable generators that were being curtailed to dynamically purchase additional local network capacity would bring a huge new pool of value and flexibility to market- this is particularly true at a distribution level today, where asset operators are not refunded for curtailment. But the same method might be used to enable transmission connected generators to connect faster and see, perhaps temporarily, similar regional flexible demand. You might also consider a future in which large energy users like data centres and vertical farms could seed their own local flexibility markets in the opposite direction (and co-locate with excess generation). This requires software solutions and clarification of access rights. It does not require a new central authority. Also see point below on coordination.
- e) It is unclear to us how an IDSO is any better placed to bring the new flexibility and markets, implied in points 3 and 4 above, into being. Dynamic network capacity and access rights are among the key missing markets today, and this is not likely to diminish as networks become more variable, and electrification of heat and transport ramp up. Dynamic network capacity and access rights are inherently middle down and bottom-up markets. We are unconvinced that this approach is required, or able, to solve the coordination challenge. See the note on coordination below. Moreover, the uncertainty such a change will result in further stagnation in value creation, at the worst possible time with energy prices, renewable curtailment and the need for domestic energy resource at all-time highs.

- f) Any future SO would greatly benefit from unlocking new flexibility in middle-down and bottom-up flexibility markets.

**10. What do you consider to be the biggest implementation challenges we should focus on mitigating?**

Aligning incentives across all participants to facilitate more renewables/DERs coming online.

To connect these assets faster and encourage more third-party capital to invest in them, the most important missing market is in dynamic network capacity optimisation which needs to be DSO facilitated, DSO incentivised but not necessarily DSO led. This would create opportunities for local authorities and independent investors/ platforms alike.

Below this sit the existing challenges of limited public access to DSO operational data, lack of digital tools to enable dynamic market participation and lack of coordination and adoption across software and hardware standards. These need to be reviewed and tackled in tandem to arrive at a good outcome. But attractive incentives to facilitate and participate in local markets will accelerate investment and consensus around these solutions.

**11. Taking into account the varying degrees of separation of DSO roles from DNOs under framework model 1, do you consider there are additional measures we should consider implementing, in particular in the short term (e.g. changes in accountability etc)?**

As above, the fundamental problem is the lack of incentives for DNOs to allow third parties to increase the utilisation of their network on a dynamic basis:

- These third parties could include operators of curtailed renewable generators, distributed energy resources stuck in connection queues; local authorities wishing to electrify faster; and energy intensive industries.
- These incentives could be introduced to DNOs/ DSOs in RIIO-2, perhaps through ODI or uncertainty mechanisms. The delivery of value here would need to be measurable against a counterfactual of no network access at that time and no value creation (i.e., inability to export renewable power or inability to sell power at a charging station).

We also note, as mentioned above, credit support for DERs investing in being able to response to commensurate dynamic price signals.

**12. Are there other key changes taking place in the energy sector which we have not identified and should take account of?**

Yes. In particular the way in which current SCR determinations are implemented and, looking further down the line, the way in which discussion around nodal pricing are developed.

**SCR Obligations**

As drafted, require DNOs to guarantee maximum curtailment volumes in the short term and zero curtailment dates in the medium to long term. We understand that this approach has been taken to bring certainty to investors of new clean energy assets, such as electric vehicle charging stations. However, at surface level this decision seems at odds with the direction of travel for a predominantly variable generation mix. In sunny and windy areas, it is already economically rational build more generation than network capacity. Connection arrangements that seek to guarantee 100% export risk dampening the incentives to collocate flexible industry with these resources. Vertical farming is just one example of a low carbon industry whose unit economics would be transformed by access to occasionally abundant clean power at a local level. Making sure that SCR implementation does not dampen incentives to optimise use of renewable energy and network capacity locally is key to unlocking the virtuous circle of bringing more flexible demand to windy and sunny regions, and in turn encouraging more domestic wind and solar capacity to attract investment.

### **Nodal Pricing Discussions**

This is being discussed as a top-down way to unlock some of this locational value, however the efficacy of such a solution is heavily dependent on how local these signals get and how much liquidity can be created at each node. Two upfront challenges on this are a) much of the demand congestion is going to happen at an extremely local level as we electrify heat and transport; and b) the level of granularity of pricing behind nodes is going to vary hugely depending on network headroom, weather resource and local grid topology (rural vs urban vs industrial etc). All this would imply that it is vital to incentivise and scale dynamic, local flexibility markets, as set out above, ahead of taking any decisions on how such nodal pricing might be structure and how deep it should push into low voltage networks.

### **13. What do you consider to be the most important interactions which should drive our project timelines?**

- 1) Interactions with technology solutions companies to understand commercially available solutions
- 2) DSO interaction setting stronger incentives to facilitate bottom-up dynamic network capacity optimisation markets
- 3) Asset community engagement in order for these markets to scale.