Commission for Regulation of Utilities

19 March 2024

Emailed to: electricityconnectionpolicy@cru.ie

RE: Large Energy Users connection policy

Introduction:

Energy Storage Ireland (ESI) is an industry representative association comprised of members who are active in the development of energy storage in Ireland and Northern Ireland. Our aims are to promote the benefits of energy storage in meeting our future decarbonisation goals and to work with policy makers in facilitating the development of energy storage on the island of Ireland. We represent over 60 member companies from across the energy storage supply chain.

We would like to thank Commission for Regulation of Utilities (CRU) for the opportunity to provide feedback on the Large Energy Users connection policy.

We are now living in a world where there is a clear imperative to decarbonise the electricity grid as quickly as possible and we need to achieve this at least cost to the consumer. Energy storage will play an essential role in facilitating the higher levels of renewable generation on the power system required to achieve national renewable electricity targets and, ultimately, it will be the key to unlocking a truly Net-Zero, renewable energy power system. The flexibility of storage systems and their ability to contribute to the energy, capacity and system services markets allows them to deliver a wide range of benefits to end consumers such as wholesale energy price reductions, reduced CO2 emissions and flexible system support services to help manage the grid with higher levels of renewables.

We note that this consultation considers a broad spectrum of issues and a lot more than just energy storage. Whilst we don't believe that the intention of this consultation is to classify energy storage as a large energy user, in the sense that storage is not a final demand user, we do believe there are areas for consideration in the paper that could apply to energy storage. Therefore, we have taken the approach of highlighting some key points we wish to make in relation to the consultation. These key points relate to:

1. Behind the meter storage
2. Flexible connections
3. Network charges.

Key points:

Behind the Meter Storage:

Behind-the-Meter (BtM) is a particular type of energy storage which receives its name through the manner by which it is connected to the electricity grid. BtM refers to any type of energy storage that is directly connected into the customer's site, or neighbouring site, and therefore connected to the grid on the customer's side of their electricity meter. While BtM is possible at the residential level, for the purposes of this consultation response, the definition and scope will primarily be presenting information related to storage above residential level (e.g., above 100kW) and particularly relevant to Large Energy Users (LEU's). ESI believes there is an unequivocal opportunity for BtM storage to aid the decarbonisation journey of LEU's. We have set out our reasons for thinking this below.

The primary reason(s) for installing a BtM unit can vary; some customers may wish to have access to such storage to provide energy support however this is usually ancillary to the customer's primary site activities and thus acts as a backup and provides resilience to grid supplied energy. Some customers may be more concerned with the energy cost savings that a BtM unit can bring whilst other investors may seek to install BtM storage to complement a renewable-generation project or engage in aggregated demand-side response (all explained below). It should be noted that whilst the primary reason for installing a BtM unit may vary, the benefits provided are not separate to each other, but rather complementary.

There are several benefits that BtM can offer customers, each of which is discussed below. It should be noted that these advantages are not exclusive to different types of BtM units, and customers can often reap the rewards from different combinations of the benefit streams below.

1. Energy Cost Savings – BtM units allow owners to engage in what is known as energy arbitrage, essentially buying energy and charging the battery when the electricity price is low and then later using the stored energy onsite to avoid times of higher electricity prices. Not exclusive to BtM but rather a common benefit of all storage units, this allows consumers to save money on energy bills as it reduces their demand for electricity during peak price hours (also known as 'peak shifting'). The operation of a BtM unit is often made the responsibility of a third-party who will optimize the use of the system over its lifetime for a small fee.

2. Grid Resilience – In the event of a fault, BtM units can provide valuable back-up power to consumers through its stored energy. The typical duration of a BtM unit in use in Ireland today is two hours, which means that a consumer would have access to two hours of uninterrupted power even when a power outage in the wider grid occurs. BtM storage also allows commercial customers to use their BESS unit for critical services. Critical services

refer to back-up power however the power is only used to serve site equipment that is essential to always remain in operation. Additionally, as uptake in heat pumps and electric vehicle charging of cars, forklifts, and other suitable vehicles increases in the coming years, BtM units can support this transition by providing energy during periods of higher-than-expected demand on the grid and a customer's site.

3. Export Trading Revenue – If BtM units have excess energy stored, owners have the option to export this electricity back onto the grid and earn revenue from selling this power, especially during times of peak electricity prices. This is most easily done through an aggregator of BtM units who will optimize this export, again for a small fee, but the opportunity offers customers access to an additional revenue stream as part of their investment.

4. Demand Side Flexibility - Demand-side flexibility (also known as demand-side response or management) involves users of electricity having the capability to change their usage from their normal or current consumption patterns. The action taken by the user of electricity (BtM customers included) is done in response to a signal from the electricity grid operator (EirGrid or ESBN in Ireland's and SONI or NIEN in Northern Ireland's case) and helps these state bodies in managing the power system efficiently; including accommodating increased renewable electricity generation and providing enhanced capacity. This need for flexibility is becoming increasingly important as Ireland and Northern Ireland increase the amount of wind and solar energy on its system. For instance, Ireland's Climate Action Plan outlines the need for 25 30% of Ireland's demand to be 'flexible' by 2030. The key point here is that BtM storage can contribute to a significant proportion of this. With many cases of BtM already situated within a demand-side unit (DSU) on the island, there is massive potential for BtM to play an increased role in the DSU fleet while also decarbonising existing assets and assisting the transmission system in times of peak demand or system alerts.

5. Increased Environmental Performance – On a customer's site, BtM units can displace a fossil fuel-based generator that would otherwise have been purchased to provide similar back-up power services, providing a quick and cost-effective solution to support Ireland's transition toward a net-zero economy. This use of a BtM system in place of a fossil-fuel based generator avoids the release of harmful emissions into the environment and has benefits for local air quality.

6. Complementarity for renewable generation - Where a customer has already installed a renewable generation system on their premises, a BtM unit can significantly improve the gain accrued to such system owners. For example, a BtM unit can complement a Solar PV system by storing the energy generated by the solar panels until such a time when the customer needs it and renewable output is lower, potentially at times of higher energy

prices. This allows customers to reduce their exposure to peak prices and make more optimal use of the clean energy being generated on their site.

We support measures that can increase the use of on-site storage & renewable generation with LEUs. However, in order to fully realise such shared benefits, it is important that the barriers BTM faces today are addressed. These barriers are not all unique to BtM, but rather are indicative of the wider barriers that the storage industry faces in Ireland, and include:

- Grid Connection Barriers - As discussed, BtM customers may seek to export excess electricity from their unit back onto the grid and earn revenue from this activity. However, to receive an export license, BtM projects must go through the Enduring Connection Policy (ECP) process which adds lengthy delays to project timelines, as well as added cost. Although the ECP process has been successful to date in providing grid connections for front-of-meter wind, solar and other forms of storage, its rulesets are not suitable for BtM as there is no specific pathway for these units. Allowing BtM units to secure a grid connection export license with less difficulty and even with certain conditions attached would allow for the realization of benefits of BtM units, address capacity issues, and improve the financial viability of projects.
- Inability to Share MEC - Maximum Export Capacity, or MEC, refers to the maximum amount of electricity that a generation unit or project can export onto the grid at any given time. Currently, if there are two types of technologies on a site, for example solar and a battery, the MEC assigned to this site cannot be shared across the two technologies. Instead, the solar and battery units are treated as two separate systems and the customer is required to submit two applications for separate MEC licenses which again adds extra costs and time delays to projects. This barrier of hybrid-type connections has long been identified as an issue for Irish policy makers to address and would certainly benefit BtM units that are seeking to complement an existing renewable generation unit on a site.
- Tariff Structure Issues - Tariffs are the rates that customers pay suppliers for the electricity that they consume. For BtM units, tariffs are applied at the same rate at which the customer demands electricity for their regular site activities, however a tailored programme would incentivize greater investment across the country. The current absence of a clear and adequate tariff structure has prevented widespread uptake in BtM units, insufficiently rewarded energy arbitrage opportunities, and led to inefficient use of systems. To incentivize uptake in BtM storage from an early stage, the feasibility of fixed price import tariffs for BtM units should be studied in greater detail and discussed with suppliers, aggregators, and system operators. Done most effectively through an aggregator, fixed pricing arbitrage essentially fixes a price for all electricity bought and stored in BtM storage systems and can be used as an effective tool in

reducing uncertainty around energy savings for potential investors as well as targeting any information asymmetry issues.

- Existing Market System Limitations - As things stand, all storage projects are not able to participate fully in the energy market due to limitations in the Transmission Systems Operator's (TSO) market systems. This prevents storage assets from selling the energy they store into the wholesale market and competing with other market participants. These current limitations harm the business case for existing and new storage investments and also mean that consumers cannot avail of this valuable service that storage can provide. Upgrades to TSO market systems are in progress but clear timelines and milestone are needed so industry has certainty that these issues will be resolved.
- Low-carbon Discounts – In terms of reducing electricity sector emissions as soon as possible, there are many storage technologies which are already proven and available and could be deployed in the near term. By absorbing grid power during off-peak, low carbon intensity periods and using it during high intensity peak periods, a carbon arbitrage function is served by BtM storage. Deployed at sufficient scale, a meaningful contribution to decarbonisation is achievable. This valuable function should naturally be rewarded however, such low-carbon incentive schemes do not exist in Ireland. One initiative that could be introduced is reduced use-of-system charges (fees that are paid for the transmission of electricity across the grid) to incentivize the demand of electricity during low-carbon intensity times which would better reward BtM storage for acting as an offtake mechanism.
- Planning - Considering the multiple benefit streams that BtM can bring, it is crucial that lengthy planning timelines do not restrict the wider rollout of such technologies. Streamlined applications will be necessary to prevent bottlenecks and ensure that BtM can fulfil its potential without delay. One solution to increase uptake in BtM would be to allow for a planning permission exemption for BtM units up to a threshold limit. Similar solutions have been put in place for the deployment of Solar PV for onsite use.

Flexible connections

As previously presented to CRU, ESI are aware of several battery projects in the connection offer process that are being offered lower MICs than they applied for which can be substantially less than the MEC offered in some cases. We have also noted particular clauses in the connection offers being issued that contain unnecessary restrictions or are unclear and potentially very damaging to the business cases for these projects.

Following the recent ECP 2.4 batch and the fact we will be moving to a new connection pathway in the near future, we believe engagement is needed in this area urgently. Otherwise, there is a risk that projects will withdraw from the process, or their operations will be restricted

and the benefits storage that can deliver in terms of flexible demand, system services and security of supply will be severely curtailed.

These unnecessary restrictions or limitations on MIC have a significant impact on the business case for storage projects these include, increased charging times, the ability to access energy arbitrage opportunities and risks availability for CRM/System Services obligations. This is particularly relevant in the context of the developing storage pipeline that is moving away from primarily DS3 services/short duration batteries to longer durations energy storage technologies that depend more on energy arbitrage and other revenue opportunities to make their business case viable.

As we have proposed in a previous note to the TSOs, we believe there are pragmatic solutions that can be put in place building on policy already implemented in areas such as data centre connections. In summary:

- A policy for processing storage connection applications for both MEC and MIC is needed. This should recognise that energy storage is a flexible asset that will aid the operation of the system, reduce renewable dispatch down and displace fossil fuel generation at times of peak demand. The profile of a storage system i.e. charging at low demand/high wind and discharging at high demand/low wind should not present additional system demand during periods of congestion.

- A policy for flexible connections should be considered. This is particularly relevant in constrained regions where the SOs may have concerns with allocating additional import capacity. This policy would provide capability for a storage unit to access their full desired MEC/MIC at certain defined times. We would welcome engagement with the SOs on how this could be facilitated.

- This policy should adequately reflect the fact that storage projects need sufficient access to the grid to manage their business cases while respecting the SOs' need to maintain the stability of the system and ensure security of supply.

- We note that CRU and EirGrid have put in place a flexible demand policy for data centre connections and there may be learnings we could take from this.

Network charges:

Storage technology is an important element of Ireland's technology mix in working towards our 2030 and Net-Zero targets. The reason that storage is so vital to achieving these targets is that it presents the opportunity to 'smooth' the profile of our abundant, but variable, renewable resource and match it better to the demand profile. In other words, storage projects

can be used to charge (or import) energy at times of high renewable output and discharge (or export) at times of low renewable output. This very use-case of storage means that storage will tend to act against the normal flows on the grid i.e. storage is basically a contra-flow device on our grid. Therefore, building out grid reinforcements for storage connections and imposing conventional network charges on them for this purpose is not rational.

We believe the concept of flexible connections for MEC/MIC should be considered in further detail for energy storage assets as applying "traditional generator" or "traditional demand" modelling assumptions and planning standards to these assets is not appropriate and will lead to unnecessary grid build out. Energy storage assets should not need 24/7 access to their full MEC/MIC as their profiles should work with the existing grid. The role of storage in managing congestion has been recognized in other jurisdictions such as Great Britain in terms of revised modelling and planning standards.

Restricting MEC or MIC based on current planning standards or approaches will constrain the development of energy storage assets and their ability to provide the essential services this procurement is intended to deliver. Indeed, storage should be considered in terms of its ability to create firm capacity on the grid by reducing renewable constraints. Network charges applicable to storage should reflect this locational benefit of storage and even reward storage assets that are alleviating congestion, deferring transmission reinforcement, and creating firm capacity.

As storage is classified as a generator under current policy, units will be liable for TUoS charges. Generation charges are currently not levied on storage, but Demand TUoS charges are (e.g. demand network capacity, network transfer and system services). These charges can be significant for storage units and do not reflect the fact that storage is neither generation or demand and is providing a valuable flexibility service by aiding the operation of the grid and can in fact alleviate grid congestion if given the right commercial incentives to do so. These charges act as a barrier to the business case for storage units as high import/usage charges mean the revenues that can be earned from energy arbitrage are significantly reduced.

The demand charges incorporate a fixed charge and consumption charges, among which include the Demand System Services Charge. This charge is for metered consumption per MWh and as an example for Transmission-connected units consists of a peak charge of €20.5803/MWh and a non-peak charge of €18.7093/MWh, as per EirGrid's 2023/24 charging statement.[1]

The difference between the peak and non-peak charge is minimal, meaning there is limited price signal to incentivise efficient consumption of energy at appropriate times. In any case

[1] https://www.eirgrid.ie/site-files/library/EirGrid/EirGrid-Statement-of-Charges-2023-2024.pdf

both charges are extremely high and a significant disadvantage to storage assets as these charges must necessarily be added to the cost of energy imports that then reduces effective arbitrage opportunities.

As outlined in the EU Commission's recommendations paper 2023/C 103/01 on Energy Storage published in March 2023[2], "Consumption from the grid during peak hours can be reduced through well-designed network charges and tariff schemes that strengthen the use of flexibility tools such as energy storage", and "final customers should not be exposed to double charges when providing flexibility services to system operators using front-of-the-meter storage facilities". The goal should be to incentivise storage assets to charge at off-peak times or at times of high renewable generation and to supply this stored energy to consumers to displace other expensive forms of generation at peak times or during low renewable output.

It also does not make sense to charge storage to cover the costs of system services and the network when these assets are providing those same services which are of benefit to the network and to consumers.

Overall, this is a case of storage being placed intro existing frameworks which were designed for other system users, are not appropriate and do not recognise its unique characteristics or benefits to the system. We request that these demand charges are removed for storage assets, with the exception of import for house load purposes, as per the principles outlined in the CRU decision on the application of the PSO levy to commercial storage.[3]

Separate to volumetric Demand Use of System charges, the demand network capacity charge applicable to MIC can act as a barrier by disincentivising storage from availing of an MIC equal to MEC. This is a problem because the significance of the charge can encourage storage to apply for low MIC which will limit the flexible benefits of the technology (the slower it can recharge the slower it can adapt and react to varying system needs) and thus reduce the benefit it can offer to the system. Consistent with the flexible connections section above, we believe the solution to resolve this issue is to offer flexible MIC to energy storage units. Storage units are neutral capacity at minimum and if operated on a contra-flow basis can create capacity, therefore they should not be charged (or apply a lower capacity charge to flexible MIC connections via a new charge classification for flexible demand).

Beyond these interim steps (which we believe will significantly unlock barriers to developing energy in Ireland) we believe the ultimate solution is to introduce dynamic tariffs with the potential for negative charges (remuneration) in certain conditions where an energy storage unit can offer benefits to the system by alleviating local congestion.

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[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023H0320%2801%29&qid=1679302898964

[3] https://www.cru.ie/publications/26411/

Conclusion

We would like to thank the CRU for offering us the opportunity to respond to this consultation. We are available to discuss any of the points raised in our response.

Kind Regards,

Bobby Smith
Head of Energy Storage Ireland