



Commission for Regulation of Utilities

Submitted via email to: **electricityconnectionpolicy@cru.ie**

Submission Date: **March 19, 2024**

Submitted by: **Sean Lyons, SETU**

Contact: **sean.lyons@waltoninstitute.ie**

In Response to: **Review of Large Energy
Users connection policy**

Introduction

The Walton Institute (formerly TSSG) is the Information and Communications Technologies (ICT) research arm of South East Technological University (SETU). We carry out a wide spectrum of industry-informed research in ICT, particularly technologies enabling communications and information services and have a team focused on solutions in the smart grid energy space. The team has been involved in multiple projects enabling the Clean Energy transition such as RegEnergy and Sustainability Dingle. SETU has developed technology to facilitate distributed generation and enable smart grid initiatives such as Peer to Peer (P2P) energy trading which will facilitate the evolution of prosumers who can maximise their self-sustainability.

The EU has developed the Clean Energy Package (CEP) that will help the EU meet its 2030 climate and energy objectives. In particular, the Renewable Energy Directive and the Internal Electricity Market Directive contain provisions that establish a supportive EU legal framework for community ownership. In preparation for the transition to these new energy systems, SETU has developed technology such as an Optimisation software platform with the potential of being the hub of energy clusters such that supply and demand profiles can be balanced in a local, distributed manner and facilitate Energy Communities. SETU, through the RegEnergy project, is trialing technology at a number of commercial and industrial sites and envisages the data and learnings that emanate from them may inform decisions going forward and become part of the consultation process.

Large Energy Users are the perfect anchor tenant in an Energy Community and therefore, their connection policy is of interest particularly around the discussion of Energy Parks. As SETU is primarily involved in local Energy Communities of Industrial, Commercial and Residential members, we will ignore some areas and focus answers targeted toward the electricity aspect in the following areas;

- Location of LEUs – the proximity to renewable energy, availability of grid capacity, co-location of supply and demand, the concept of energy parks.
- Non-firm demand connections – the provision of non-firm or timed connection offers for electricity.
- Onsite generation and storage.
- Demand flexibility.

Therefore, we will only address questions from Sections 3.4, 3.5, 3.6 and 3.7 and how Connection Policy affects Energy Communities.

Q15 - Should new LEUs be located close to areas of renewable generation and/or storage or within energy parks?

Large energy users can be a focal point of Energy Communities by being the anchor tenant giving the cluster the scale to generate their own renewable energy and deploy smart grid techniques and batteries to maximise their sustainability. This facilitates them to take control of their energy

profiles and become prosumers to play a central role in the Clean Energy Transition. New EU Directives have been implemented which place the energy citizen at the centre of this transition. Industrial Parks with LEU's could form the hub of these Energy Communities where renewable energy could be generated and shared amongst the members, reducing costs and CO2 emissions and improving sustainability.

For these Energy Parks to maximise their self-sustainability, balancing of supply and demand will require mechanisms such as Peer to Peer (P2P) energy sharing to be facilitated from the new EU Directives. This energy sharing must be physical to realise the advantages these Energy Parks can provide and therefore, the load demand of the members must be located within the same network of transformers/feeders as renewable generation and battery storage.

Q.16 What type of measures to facilitate this approach could be introduced to encourage new LEUs to locate close to renewable generation.

Energy citizens, from industry to residential, can be empowered, through Energy Parks/Communities to use mechanisms such as Peer to Peer trading, Demand Side Management, Load Shifting, and Battery Storage.

Q.17 Should there be any exemptions to locational requirements for certain LEUs?

No, same rules should apply to all Energy Parks regardless of size.

Q.18 Comments are invited from interested parties on the level of proximity between LEUs and renewable generation?

As Q15 above – should be on same 10/20kV or MV network so effect on rest of grid is not negative and any capacity issues do not arise. The recent Private Wire/Network responses we submitted also covered this point and the importance of physical energy sharing.

Q.19 If locational requirements are introduced, there is a need for better integrated planning of the network, generation and demand. What are the roles of the System Operators and enterprise agencies in supporting/facilitating this?

Currently, if an Energy Park were to be introduced at an existing site, such as an Industrial Estate with LEU's, the network connecting these load meters is operated by the DSO. As P2P energy sharing is not yet allowed in Ireland, there have been certain mechanisms such as Private Wire/Network suggested to facilitate connection of renewables with load demand. This may allow parties other than ESB to own electricity infrastructure, outside the confines of their own property, and to transmit electricity over this infrastructure. This could potentially open up opportunities for distributed generation assets to be connected to industrial loads on adjacent lands. Interestingly from an Energy Community perspective, the Consultation also discussed the potential of Private Networks, which could facilitate the development of Renewable Energy Business Parks. These projects would see the development of a privately owned, operated, and maintained electricity network, for the purpose of supplying power to a business park's residents. Projects of this nature are, for the most part, aimed at providing clean renewable energy direct to large energy users sited within a business park.

This effectively could achieve what is required in a P2P energy sharing Renewable Energy

Community (REC) albeit with a private network running in parallel with the national grid. Whether the network within the Energy Park is operated by the DSO or not, we feel that the connection point between the Energy Park and the DSO should be a master meter at the entry/exit point of the park. In that way, the park could integrate the maximum amount of renewables to balance itself along with batteries, etc. Prediction and Optimisation software systems can then be deployed to design and integrate the optimum level of renewables and control the park's energy flows to maximise self-sustainability. Export Limiting Systems and reverse relays can be deployed at the entry/exit point to ensure any Maximum Export Capacity limits that are set are never breached.

There has also been a Decision Paper released on the Installed Capacity Cap which is encouraging. The Irish grid is designed with excess capacity to cater for 'worst case scenarios' which rarely if ever occur. A solar or wind install will never export its full Maximum Export Capacity (MEC) and CRU recently issued a Decision Paper indicating its intention to remove the Cap, allowing generators to "over-install" without breaching the contracted MEC. This will mean that generators can use smart grid techniques to increase their installed capacity to ensure they are exporting closer to their MEC and 'sweat the assets' of the grid they are paying for.

From an Energy Community perspective, it is important that they have also included Hybrid co-located sites in the response. This can mean that a mix of solar, wind and battery storage could be used at a site and using Prediction and Optimisation mechanisms, maximise their output at strategic times. This 'balancing' technique is exactly how REC's should work with on-site loads. In this way, the REC could integrate the required amount of renewables to balance itself against its load profile while ensuring through its Prediction and Optimisation systems that its MEC is never breached. CRU realise that removing the ICC for Hybrid sites brings into play aspects such as sharing of MEC and the ability to have Multiple Legal Entities behind a single connection point. These aspects are also required for P2P REC's and should be integrated across the network. It will also mean that ESBN will need to incorporate technology to ensure MEC caps are never breached. Therefore, the Private Network and Installed Capacity Cap initiatives feed into the discussions in this Consult for Energy Parks.

Q.20 If introduced on a mandatory basis in order to recognise that any locational requirements LEU demand may require time to be facilitated, should locational requirements be implemented using a glide path?

Yes, pilot sites should first be introduced to test mechanisms before full introduction.

Q.21 Should non-firm LEU connections be introduced? If so should these non-firm connections be made on an enduring basis?

As discussed in Q19, the Irish grid is designed with excess capacity to cater for 'worst case scenarios' which rarely if ever occur. Energy Parks/Communities are a mechanism where the capacity of the local network can be better utilized with smart grid techniques employed for balancing. This reduces grid reinforcement and can delay future grid investments while sweating the existing assets.

Q.28 Comments are invited on the use of renewable generation and storage on-site. Should

this be used to match LEUs demand on-site or to provide flexibility services to the system?

Yes, balancing of supply and demand is paramount in Energy Parks. The capacity of the local grid is also a factor and an MEC should be applied to it. Even if it is zero, a large amount of renewables and battery may be installed to satisfy local demand. By aggregating the parks load profiles, flexibility services may also be supplied using flexible loads and/or batteries.

Q.31 What should demand flexibility services provided by new LEUs be used for, system support, decarbonisation or both?

Both

Q.32 Should demand flexibility services be mandatory or voluntary for new LEUs?

For new LEU's, this could be made mandatory. If within an Energy Park where new renewables/batteries are being installed to service it, flexibility services could be integrated which would have a positive impact on the wider grid. Integrating a new LEU as a stand alone project can have negative connotations for the grid, building it into a renewable energy park can be turned into a significant positive.