RESPONSE BY EQUINIX TO CRU CONSULTATION: Large Energy Users Connection policy

1. Introduction

Equinix welcomes this consultation and the opportunity to contribute to CRU's body of reference in consideration of future demand customer participation in connecting to the grid.

Our response is structured to include an overview of Equinix and our business activities. We then discuss how some of the factors which we understand are under consideration regarding connection policy affect our business. We provide summary observations and recommendations and direct responses to the specific questions raised.

We recognise the nature and scale of the challenge presented to policymakers and grid operators in setting out and achieving targets for climate action in Ireland.

Our digital infrastructure platform business puts Equinix at the heart of much of what is driving society's collective journey to net zero. Equinix provides services in support of mass digitalisation, whilst improving our customers' energy management and energy efficiency in managing digital workloads. Our facilities underpin society's ability to continuously push technological boundaries, so that we may benefit from smart interconnected systems in health, commerce, transport and all facets of modern society.

We are acutely aware of the fundamental importance of our facilities to a sustainable, fully-functioning and thriving local economy and society. As our socio-economic goals evolve, we strive to identify ways in which we can help to achieve those goals, using our available resources. We look forward to continuing to play our part as an active and conscientious participant in the energy system and digital ecosystem in Ireland.

Data centres and the Equinix business

Data centres support every conceivable aspect of our lives: transport infrastructures, Government services, telecommunications, entertainment, business processes, and social networks.

The Irish Government places data centres at the "epicentre" of the "twin-transitions", digitalisation and decarbonisation[1].

Almost every app on a smartphone today will house its data in a data centre and use that Equinix facility to connect to a huge range of other apps, businesses and services right across the world with the click of a button or connection of a cable. Equinix data centres exist to ensure innovative technologies such as connected cars, streaming services and even augmented reality gaming, can function seamlessly.

As well as facilitating strong business performance, these services are essential for personal pursuits reliant on digital connections, such as the use of more sophisticated apps, making online purchases, video calling friends and family, or using streaming services. In addition, everyday norms like remote work, food delivery

[1] Department of Enterprise, Trade and Employment, Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy, July 2022

and online shopping, are all made possible by data centre infrastructure.

The importance of data centres was particularly highlighted throughout the COVID-19 pandemic, which showed just how crucial it is for companies to have an online presence and robust digital infrastructure. Those that did not, struggled to survive.

Major international institutions, including many Government departments, rely on Equinix with many Equinix facilities deemed Critical National Infrastructure in various locations including Paris and Amsterdam.

Elsewhere, in 2023, the Government of Singapore reversed their ban on data centres and awarded capacity to a small number of specific data centre providers, including Equinix, because they recognised the importance of Equinix to the Singapore economy and country.

As demand for processing and storing data continues to accelerate with businesses moving to private and public cloud and online applications, organizations seek greater digital proximity to their customers. This has resulted in the data centre industry becoming the foundation of the global ICT ecosystem.

The term “data centre” is often broadly applied to rooms or buildings that offer space, power and cooling to house and host servers, compute, storage and other ICT equipment. But Equinix is so much more than that. Our ultra-modern IBX data centres have transformed from simple off-premises storage solutions into a globally connected digital platform where the world comes together to enable the technologies that enrich our work, our daily lives, and our planet. We are committed to a vision of Ireland that realises the potential of the digital revolution and can provide the innovation, scale, and connectivity to help make this happen efficiently and sustainably.

2. Types of Data Centres

Data centres are typically classified as Single Tenant or Colocation. Recently we have seen the emergence of AI data centres. The AI type of data centres will have rapid growth in the coming decade.

- **Single-Tenant or Enterprise (includes Hyperscale)**

In the case of an enterprise or single-tenant data centre, one business owns or controls the servers and peripherals and may own the facility itself.[2]

Many of these companies are in cloud, data or digital content industries and require massive capacity and compute power. Historically, Enterprise data centres have been developed near multitenant or colocation data centres to ensure faster and more robust connectivity to the broader ICT ecosystem. However, increasingly locations further away from the connectivity dense metros, in rural or remote areas where land and power are more accessible, are under consideration.

Public cloud-compute campuses in Ireland are hubs for Europe whereas Equinix in Dublin is directly supporting the needs of Ireland. New public cloud-compute campuses are often in need of much greater quantities of power than retail colocation facilities.

[2] Equinix also has a business unit known as xScale, a global joint venture offering a large-scale single tenant solution.

➢ **Colocation or Multitenant (e.g. Equinix International Business Exchanges)**

At Equinix, our purpose is to be the platform where the world comes together, enabling the innovations that enrich our work, life and planet. We offer a fundamentally different value proposition to single-tenant data centre operators in what is known as retail colocation or International Business Exchanges ("IBX") in 71 metropolitan cities globally.

These IBX facilities host multiple tenants that co-locate their IT equipment in individual secure cages within buildings that are close to various digital services, customers, vendors, or mission critical partners. Hundreds of clients may be housed in the facility, allowing extensive interconnection with partners, networks, and service providers. Colocation facilities allow everyone, from start-ups and smaller firms to Fortune 500 companies, to house and power their IT infrastructure in an energy- and cost-efficient, secure, and professionally managed environment.

These facilities uniquely allow customers to "peer" or directly connect enterprise-to-enterprise. Peering enables enterprises to exchange data directly, bypassing the public internet. This is done using physical cross connects (fibre-optic cables) or software-defined networking (SDN) to facilitate private data transfer from one entity to another. Direct interconnection improves speed, performance, security, cost and latency. Equinix is the world's leader in digital interconnection, with over ten thousand customers and almost half a million cross connects. This uniquely dense ecosystem is part of the reason not only companies but government agencies, hospitals, transport etc. are housed within Equinix IBXs in major metros to support their economies.

Figure 1 illustrates the importance of interconnection to Equinix retail colocation compared to other types of data centre.

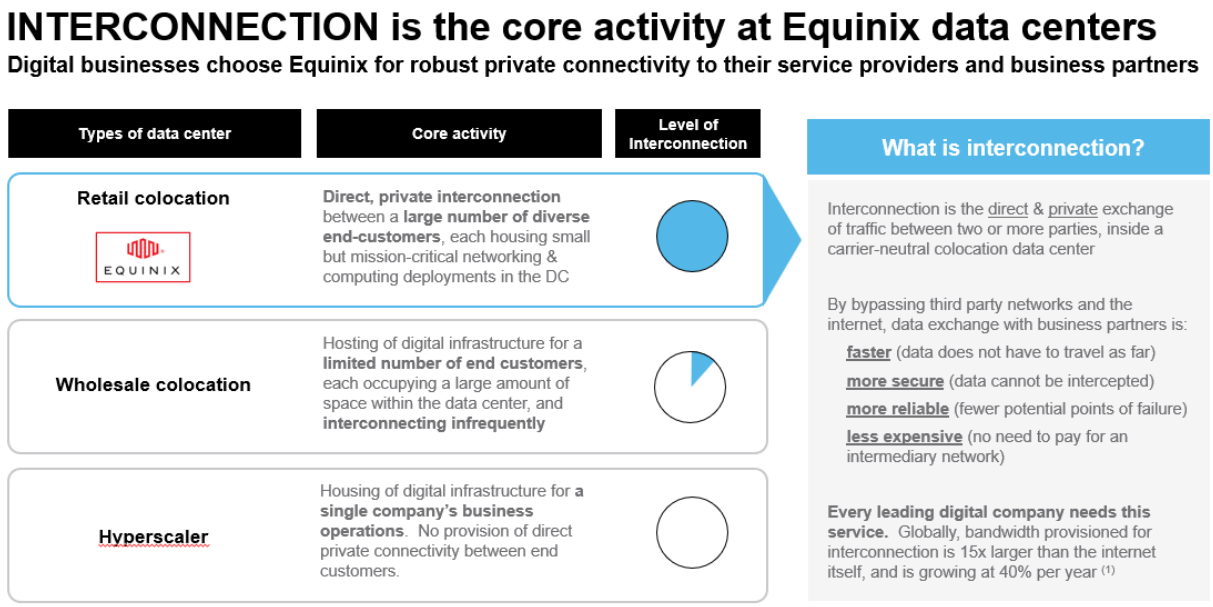


Figure 1: the importance of interconnection to retail colocation data centres

From an energy efficiency and sustainability perspective, colocation data centres allow customers to move on-premises IT infrastructure from inefficient locations, such as offices or warehouses, and move them into modern and highly optimized data centres. This improves security and performance and leads to a

significant reduction of energy use. Almost half of all global data centres are still on-premises, with inefficient power usage, often multiple times those of purpose-built Equinix IBXs. A 2018 EU funded study indicated that public on-premises data centres had a Power Usage Effectiveness (PUE) of 1.5 at best, but often went as high as 5, 6 or even 7[3].

Multitenant colocation data centres typically take IT infrastructure and workloads that were already present in the region (but diffusely) and/or planned workloads, and concentrate them in an energy efficient environment, reducing the total energy consumed for the same workload. Invariably customers, many of which support Critical National Infrastructure, require the IBX in which they locate their digital assets to have the lowest latency possible, and be within 60 minutes from their Dublin offices, so their engineers can be on location quickly.

➢ AI Data Centres

Artificial intelligence (AI) innovation, particularly generative AI, is altering the way we work and live in fundamental, profound, and likely irreversible ways.

Unsurprisingly, AI applications are very power-intensive. Particularly, deep learning models lead to higher processing requirements for data centres because training and executing AI models relies on substantial computational power. Running these applications demands advanced hardware such as GPUs (Graphics Processing Units - specialized electronic circuits that accelerate graphics and image rendering) and TPUs (Tensor Processing Units - circuits designed to accelerate AI and machine learning workloads).

Traditional data centres are designed with 5 to 10 kilowatts per rack as an average density; the advent of generative AI now requires 60 or more kilowatts per rack. Moreover, AI applications generate far more data than other types of workloads and thus require significant amounts of data centre capacity.

One of the greatest challenges is that AI is not a homogeneous entity, rather it is a technology that is split into two distinct phases: training and inference.

AI Training requires less focus on resilience and redundancy, and more on cost, PUE, and general efficiency. They tend to be installed away from urban areas in proximity to available power & land.

AI Inference, on the other hand, is very latency sensitive and will require proximity to a metropolitan hub to ensure quick response times for user interfaces and applications.

3. Data centre demand drivers and industry growth in Dublin

The fast and secure connectivity provided through data centres - particularly colocation facilities - enables the development and deployment of emerging technologies and products, which require the ability to scale at higher speeds, greater data capacity and lower latency.

Current demand drivers behind the growth of the data centre industry include:

- Digital migration to hybrid work/online learning
- Proliferation of mobile devices

[3] Final report of the eureca project: https://www.dceureca.eu/

- Social media platforms
- Business applications
- E-commerce
- Cloud computing
- Financial institutions and digital payments
- Internet of things (IoT) / connected devices
- Autonomous vehicles and connected cars
- General ICT innovation
- Content, video and streaming entertainment
- Broadband investment and expansion; 5G
- Enterprise digital transformation
- Civic digital transformation / IT modernization / data centre consolidation
- Artificial intelligence data workloads
- Digital marketplace platforms

For enterprises seeking to grow and succeed in today's digital landscape, the collective influence of these trends is driving demand for more robust connectivity, as observed in Ireland. There is an accelerated demand for companies that can provide a secure, agile, and global business platform that leverages interconnection-enabled private data exchange to deliver a faster and more secure global reach. For business continuity assurance, these companies require the physical location of their private digital assets to be accessible by their own digital infrastructure engineers within a short timeframe.

Dublin has a robust network infrastructure, including high-speed fibre-optic and subsea cables, making it a significant hub for data centres. It is a hive of economic activity, with a Europe-leading data centre ecosystem based on successfully attracting technology companies.

Ireland's temperate climate and large wind energy resources (as reported by Bloomberg New Energy Finance[4], cited in the Government Statement on the Role of Data Centres), together with our highly skilled workforce, has helped to attract technology companies here.

Major network and internet service providers (NSPs and ISPs) choose to locate in Dublin due to its strategic position as a connectivity hub with access to subsea communications cables, internet exchange points, and a large market in Europe and the UK. Dublin offers a stable business environment, skilled workforce, and proximity to data centres, making it an attractive destination for establishing network infrastructure and serving customers efficiently.

Limitations on the availability of capacity in Dublin will constrain enterprise growth in Ireland, forcing companies to scale back their own growth plans or potentially relocate their digital infrastructure or even their enterprises overseas.

4. The impact of colocation and interconnection on cloud computing

The efficiency and ease of data flows made possible by interconnection have given rise to a commercial best practice of hybrid multicloud adoption. Today, enterprises are determining which cloud services offered

[4] BloombergNEF, Data Centers and Decarbonization Unlocking Flexibility in Europe's Data Centers, 2022

by top cloud service providers (CSPs) like AWS, Microsoft Azure, Google and Oracle work best for different workloads.

Consistently in all metros, certain workloads such as financial trading, utility applications, government databases and public health applications must be kept in local, privately owned IT infrastructure (i.e. private cloud) due to performance, security, regulatory or cost considerations. The access to public cloud and to multiple public clouds (multicloud) can be facilitated in a controlled mix of infrastructure solutions to give full optionality, at best cost, on a digital architecture called Hybrid Multi-cloud.

An Equinix IBX is one of the best locations for Hybrid Multi-cloud, offering a secure environment for sensitive workloads, access to cloud through CSPs network nodes and tailored digital services. Hybrid Multi-cloud solutions are increasingly being adopted across regions and the trend continues to grow. Research shows that by 2025, 85% of global companies will expand their use of Hybrid Multi-cloud and will distribute their digital infrastructure over multiple physical and virtual platforms.

5. Geographical requirements

Many cities and regions around the world have come to recognise that data centre investments in their communities provide the foundational digital infrastructure on which IT ecosystems and their broader economies can grow. Given the functions and needs of modern data centres, there are several key competitiveness factors that will attract these investments.

Leaving aside energy requirements, generally acknowledged in the ongoing discussion in relation to LEU connections, data centre operators seek locations with high availability of fibre, cable and other telecommunication networks that can expand in an area. Providers often deliver long-haul fibre to an area along rail routes or locate near undersea cable landings. Where those routes come together provides the density needed to attract data centre development.

Equinix is a retail colocation data centre provider, so decisions on where to locate an IBX will also be influenced by the number of customers, and potential customers, that are in, or planning to locate in, the metro in which we are investing.

Most data centre operators seek to establish facilities within larger parcels of land with the ability to build out a campus. Data centre clusters and the resultant ICT ecosystems they create have been shown to develop primarily close to where business activity is already taking place with many end users, yet not adjacent to residential neighbourhoods. These clusters require infrastructure that allows easy access by associated employees and customers.

The presence of Equinix IBXs in a metro area has been shown to be of immediate economic benefit to the cities and countries in which they operate. Several other factors are of key consideration in determining optimal location of data centre facilities, in addition to the previously mentioned energy efficiency gains from moving workloads from on-premises to colocation.

Equinix’s customers benefit most from direct connectivity with other businesses, providing:

- Improved connectivity and reduced latency, which enables innovative services like FX trading and high-speed transaction computing,
- Dedicated bandwidth with highest throughput, with large capacity and increased reliability offering significant revenue generation for businesses,

- Significant optionality by offering companies the ability to choose between multiple vendors for their data strategy, all of which are part of the Equinix ecosystem,
- Increased resilience by leveraging the diversity of the ecosystem to be less reliant on any single service provider,
- Unparalleled security through direct physical connections that do not cross over the public internet; and
- Cost-effectiveness as directly connecting with other partners reduces to need to pay an intermediary transit provider for connectivity.

Equinix's enterprise customers are from a wide cross-section of the local economy. Sectors and industries within the Dublin Interconnection Ecosystem which benefit from Equinix include:

- **Technology Companies:** Dublin's interconnection networks attract a significant number of technology companies, including both established giants and innovative startups. These companies leverage interconnection to ensure reliable and fast data transfer, host applications, and provide cloud services.
- **Financial Institutions:** Dublin's' status as a financial hub draws financial institutions such as banks, investment firms, and insurance companies. They use interconnection to establish secure and high-speed connections for financial transactions, data analytics, and communication with global markets.
- **Telecommunications Providers:** Telecommunications companies play a crucial role in the interconnection ecosystem, offering the infrastructure and connectivity needed for seamless communication across the city and beyond.
- **Healthcare and Life Sciences:** Hospitals, medical research institutions, pharmaceutical companies, and healthcare providers rely on interconnection for efficient data sharing, telemedicine, medical imaging, and research collaboration. This connectivity was particularly useful to medical research companies during the COVID-19 pandemic, allowing thousands of researchers to work together.
- **Educational and Research Institutions:** Universities, research centres, and educational institutions utilise interconnection to facilitate academic collaboration, online learning, research data sharing, and resource access.
- **Government and Public Services:** Government agencies and public services leverage interconnection to enhance citizen services, streamline administrative processes, and ensure secure communication across different departments.
- **E-commerce and Retail:** E-commerce platforms, retail chains, and logistics companies use interconnection to manage online transactions, inventory management, order processing, and customer engagement.
- **Manufacturing and Supply Chain:** Manufacturing companies benefit from interconnection for real-time monitoring of production lines, supply chain optimization, and data-driven decision-making.
- **Entertainment and Media:** Entertainment companies, including streaming services, gaming platforms, and media production studios, rely on interconnection to deliver high-quality content and engage audiences.
- **Energy and Utilities:** Interconnection supports the energy sector by enabling smart grid management, remote monitoring of energy infrastructure, and data analysis for efficient energy distribution.
- **Non-profit and Community Organizations:** Various non-profit organizations and community groups utilise interconnection – INEX, the Irish Internet Neutral Exchange, is a good example of this and a key customer of Equinix in Dublin.

- **Transportation and Logistics:** Transportation companies, shipping firms, and logistics providers rely on interconnection for real-time tracking, route optimization, and supply chain management.

In Ireland, Equinix provides services to a portfolio of over 260 customers (globally over 10,000), of which the Enterprise segment covers 38%, capturing critical facilities such as financial services, health care and public sector. Ireland holds a unique position as an attractive location for international businesses, in particular large multinationals. The influence of international business is critical to Ireland's economic growth and success. The top 10 multinationals based in Ireland contribute approximately 60% of all corporation tax in Ireland[5], as well as directly employing 300,000 people, and most of them have a presence in an Equinix IBX to avail of our global interconnectivity offering and digital ecosystem.

As these businesses transform to compete and survive in a digital economy there is an increased demand to support this transformation through sustainable digital infrastructure. Successful business transformation and digital infrastructure are dependent on each other. Digital infrastructure is the foundation for all Hybrid Multi-cloud solutions and is underpinned by colocation retail data centres, particularly Equinix's interconnection dense IBX data centres, which host the computing services of the world's leading pharmaceutical, finance, technology, and service companies.

Due to constrained power capacity in Dublin, we have already seen several multinationals, many who are large employers in Ireland, recently redirect new investments to other European countries as they are unable to expand in Ireland. More recently we have also seen a dramatic increase in demand for Artificial Intelligence (AI) infrastructure, a key element of the Irish Governments 'Digital Ireland' strategy, from Irish domiciled organisations and start-ups. We are now seeing these companies looking to deploy new AI services and related businesses outside of Ireland due to constraints in the local data centre market. Those with data sovereignty requirements will need to locate in Ireland, so it is important that Ireland maintains its attractiveness for ongoing digital investment and innovation in Ireland.

The importance of Dublin as an interconnection hub over other locations in Ireland can be seen in the statistics below from Telegraphy:

Dublin
WAN Service providers – 34 (in the 90th percentile among tracked cities)
Cloud on ramps – 6 (in the 72nd percentile among tracked cities)
Cloud regions – 2
Transport level carriers – 31 (in the 93rd percentile among tracked cities)
Submarine cables – 8
Internet Exchanges – 2

Cork
Wan service providers – 4
Cloud onramps – 0
Cloud Regions – 0
Transport level carriers – 6 (in the 54th percentile among tracked cities)
Submarine cables – 1 (extended to Dublin)
Internet exchanges – 2

Wexford
Wan service providers – 2

[5] Irish Fiscal Advisory Council, Understanding Ireland's top corporation taxpayers, June 2023

Transport level carriers – 2
Submarine cables – 1

6. Our capacity requirements in the Irish market

Equinix colocation landscape in Dublin metro is divided across two campuses. Our North and Southwest campuses have a combined power use of less than 20 MVA grid capacity.

There is limited colocation space and power available to customers in Ireland given delays to new IBX builds, due to the defacto moratorium and grid access restrictions. An expansion plan for a new IBX with 9.9 MVA capacity in Southwest Dublin has been presented to the relevant authorities.

Equinix also works as part of a global joint venture on what is known as xScale, single tenant offerings. In Blanchardstown, Dublin, Equinix has developed a 40 MVA xScale campus, with a single tenant CSP. This site is fully capable of operating off grid if required, in support of the local grid flexibility and stability requirements.

Equinix is also participating in the EirGrid Static Frequency response program, and currently completing the necessary EirGrid compliance testing with the support of Enel X to actively support the grid.

7. Equinix sustainability & innovation

Equinix invests heavily in climate action and environmental impact mitigation measures, many of which also support the ongoing security and stability of the electricity grid. Equinix was a founding member of the *Climate Neutral Data Center Pact* and has a 2030 Global Climate Neutral target, backed by a near-term, science-based target validated by the Science Based Targets initiative (SBTi). In 2022 the company achieved 96% renewable energy coverage globally and was both named to the Climate Change A list and recognised as a Supplier Engagement Leader by CDP (formerly the Carbon Disclosure Project). Equinix was also recognised by the U.S. Environmental Protection Agency as the top colocation data centre company for renewable energy procurement.

Equinix is one of the largest global issuers of green bonds, with a total issuance of $4.9 Billion as of 2023. With $3.7 Billion green bond net proceeds allocated to date, Equinix has achieved a total annual avoided emissions of over 600,000 mtCO2e, or equivalent to approximately 132,000 vehicles removed from the roads each year. These investments in green building design, energy efficiency and renewable energy have resulted in an annual energy savings of approximately 1,600 GWh. As we increase our use of green bonds, we are accelerating our positive environmental impact and demonstrating significant emissions reduction potential, with a global focus, including Ireland.

In Ireland, Equinix's sustainability commitments include:

- Corporate Power Purchase Agreement – under negotiation for renewable power
- Continuous operational energy use efficiency improvements of at least 5% per annum through multiple innovations and upgrade investments
- Bio-methane project engagement – with a view to injecting bio-methane to offset any gas usage
- District heating – using waste heat capture and distribution in collaboration with Codema and local County Councils
- Implementation of Battery Energy Storage Systems (BESS)

- Solar PV onsite to increase renewable energy generation onsite
- EV charging points in the parking area for electric vehicle charging
- Installation of beehives and bee habitats onsite to support biodiversity
- Planting of fruit tree orchards to support pollination and biodiversity at our IBX sites and around the wider Dublin area
- Management of grass area maintenance to support pollinator species and biodiversity
- Installation of AgriSound monitoring devices to track pollinator activity by detecting vibrations given off by pollinators, including multiple insect species, allowing reporting on progress from baseline and potential to scale the system in various ecosystems
- Utilising and supporting local businesses during the design, construction and operation of our facilities
- Partnering with organizations to advance digital inclusion at local communities via the Equinix Foundation and Equinix WeGive initiatives
- Sharing a profile of the power ramp up on the planned new IBX site over time with the grid operators

Other notable examples of Equinix's contribution to innovative and sustainable solutions to managing scarce capacity in the Dublin electricity grid include:

- Demand response – On site power generation using high efficiency gas turbines to reduce demand on the electricity grid and support the power requirements for the data halls. This provides additional capacity to meet the growing demand for Equinix's services, but also serve as a demonstration of how the data centre sector can become a stabilising component of the overall energy system by providing demand flexibility to Ireland's power grid.
- Offering grid stabilising ancillary services to the grid operator via partnership with Enel X[6] for UPS frequency support. Equinix is participating in the EirGrid frequency response program to actively support grid stability in Dublin.

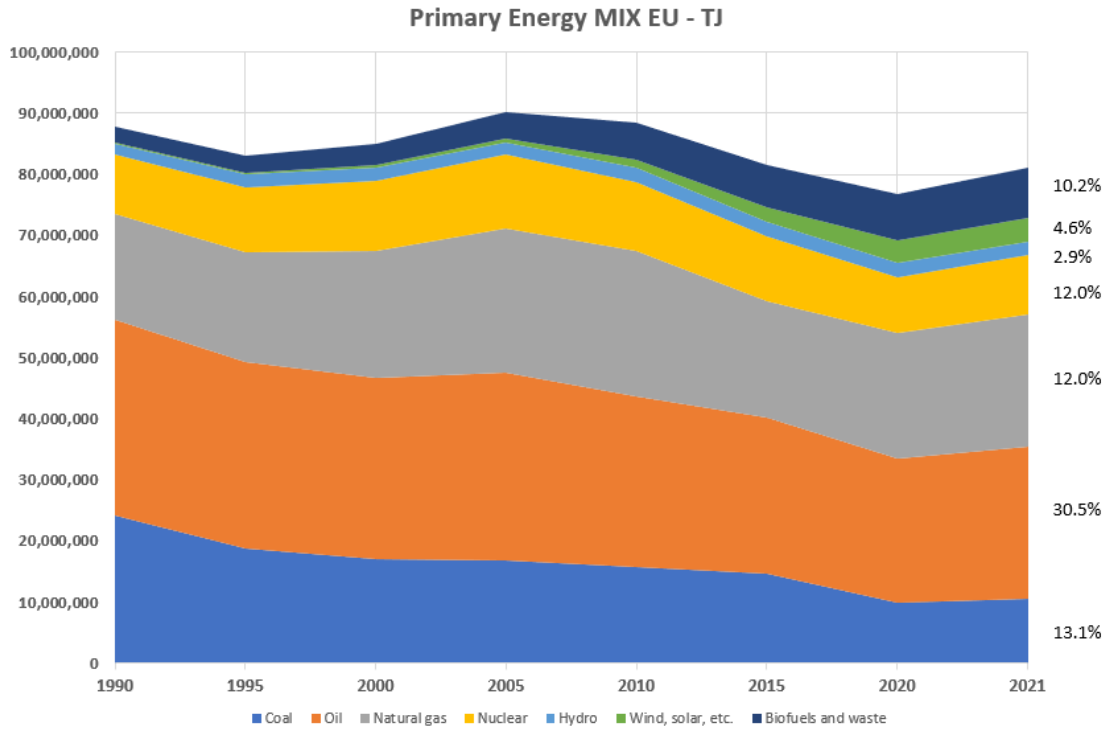
Equinix IBX locations in Dublin will use energy through electricity and gas grid connections and will optimise installation of renewable energy generation using Solar PV on IBX sites, but it is not economically feasible or appropriate from a land use perspective to install large scale renewable energy on the IBX site directly, as this would require a much larger land footprint. Equinix will ensure renewable energy additionality in Ireland via CPPA's and through the purchase of 100% renewable energy certificate coverage from our electricity and gas suppliers.

[6] https://www.enelx.com/n-a/en

8. Demand Response

Primary Energy in Ireland

In 2022, 85.8% of Ireland's primary energy requirement came from fossil fuels (compared to ~70% in EU).



In addition to the same resources Ireland uses (Oil, Gas, Wind, Solar), the world relies on resources that Ireland don't have a lot of (such as Hydro) or does not want (Nuclear).

Ireland and the EU have ambitions to transition Primary Energy to carbon free energy within a few decades. Pragmatic & realistic approaches with a roadmap that the economy & people can sustain are essential.

Electricity in Ireland in 2022:

- The carbon intensity of Ireland's electricity was 332 gCO_2/kWh.
- 49.2% of the electricity indigenously generated in Ireland came from gas.
- 38.9% of electricity generated in Ireland came from renewables.
- Electricity demand in the commercial services sector increased by 61.5% since 2012, while the electricity demand in all other sectors has increased by just 8.0%.
- Electricity demand in the information & communication sub-sector has increased by 562% since 2012.
- In 2022, 82% of all information & communication electricity demand came from data centers.

To balance grid demand & production when the grid has a high level of intermittent renewable energy sources, like in Ireland, the investment in CAPEX for controllable power generation increases significantly.

Controllable power generation - i.e. gas for Ireland - is generally designed to cover almost the full capacity of the grid with base load generation (high efficiency with combined cycle gas turbines) and a significant base of peaking plant (single cycle turbines, gas engines or ultimately combined cycle turbines).

Adapting the regulations and selecting the right technologies with the right efficiencies as well as using the available best fuel would offer the Irish authorities a good support to integrate more renewables onto the grid without jeopardizing the economic growth of the country.

At utility level, increasing the interconnection capacities with UK & France where the electricity carbon content is much lower than in Ireland, is beneficial and represents a controllable energy source that would allow increased integration of renewables in Ireland.

Data centers are working to have as much carbon free energy as possible and participate in programs to achieve those goals. A data center campus should have an electrical grid connection at the right voltage level and a connection to the gas network for backup.

Equinix capabilities to support the grid through Demand Response mechanisms include:

Demand Response from Existing assets:
1 – Fast frequency response for frequency regulation: Using UPSs and related batteries.

2 – Fast demand response (within 5 minutes) for peak shaving for a number of hours a day: Based on Onsite Power Generation (single cycle gas turbines) using natural gas from GNI.

Demand Response from Future assets:
1 – Fast frequency response for frequency regulation: Using UPSs and related batteries (autonomy of batteries can be increased for a few minutes depending on design criteria).

2 – Fast demand response (within 5 minutes) for peak shaving for a number of hours a day: Based on Onsite Power Generation using natural gas from GNI or an alternative renewable fuel source where available.

3 – Ultimately, adding a Battery Energy Storage System (BESS) that can participate in both frequency regulation & peak shaving. The investment in such assets would require regulatory and market support for monetization of the services.

Electricity consumed on site can be covered by CPPAs as much as possible. Natural gas consumed on site can also be covered by CPPAs for renewable gas where available.

In all cases, to make any Demand Response work economically, both parties must find a win-win situation where the utilities minimize their investment without jeopardizing the businesses of the energy users.

9. Equinix summary observations and recommendations under the Call for Evidence

In section 10 we respond to specific questions raised by the CRU. In consideration of the issues, the questions raised and our respective responses, we have identified the following emerging themes for consideration by the CRU in the development of future connection policy for LEUs.

❖ Balanced approach to capacity growth

Given the evidence of economic enablement from our existing capacity presented above, and the clear policy intent which is reflected in various Government publications on data centres and the digital economy, we are of the view that there should be deep concern at the impasse that has been reached regarding sustaining data centre development in Dublin. Of particular concern is the apparent absence of any potential new capacity including that which would facilitate the relatively modest requirements of retail colocation like Equinix's IBX, for example. The situation is damaging for the economy. Equinix requests that the utility operators, EirGrid, ESB Networks, and GNI carry out more in-depth assessment of more focused areas within the Dublin metro to identify what capacity can be made available to the industry, and when.

We encourage the CRU to reflect on the information presented above, particularly that relating to the geographical imperative which drives retail colocation data centre location, in the context of our relatively modest energy requirements and the contributary, sustainable nature of our interaction with the grid.

❖ Infrastructure and investment enablement

We recognise a key objective from the Climate Action Plan being the removal of systemic barriers to additionality of renewable generation and the flexible technologies which support renewable integration. CAP23 actions to address private wires and hybrid connections, for example, must be advanced without delay and activated to support future new connections for LEUs.

Data centre capacity should not be excluded from the Single Electricity Market (SEM) capacity market design and future generation capacity planning, as this creates unhelpful distortions in the market, and from a capacity perspective this ignores an important element of the demand portfolio on the island of Ireland, forcing the data centre segment to address power generation requirements which is not good practice. The system operators and the CRU have a responsibility to enable demand growth in the economy, and they have the expertise to do so. Integrating the data centre segment into the CRM would be more appropriate.

Development of market rules should consider the real financial challenges associated with 'stepping up' to meet such measures as demand side response, energy storage and onsite power generation.

The data centre sector has demonstrated willingness and capability to implement technological solutions to address the capacity constraints in the Irish (particularly Dublin) market. Even where grid issues required the implementation of measures such as temporary suspensions to grid connections, it is neither logical nor economically sensible to maintain such stringent measures where mitigations such as flexible connections are available.

❖ Recognising and rewarding performance on the journey to net zero

As shown in the outline of our investment and activity in sustainability and innovation above, we are

ambitious and unfaltering[7] in our support of measures towards decarbonisation whilst maintaining our vital contribution to modern industry and commerce. In recent years, social policy has rightly sought to rebalance what may be seen as relative inaction on climate change mitigation over the past several decades.

Climate action is a global objective and Ireland is playing a large part in providing the vision and leadership required to make what are considerable changes across our society including in the way we, as data centre operators, carry out our business.

We must recognise progress and improvement for exactly that which it is. The industry has travelled the journey from less efficient power usage effectiveness down to 1.4. Equinix alone has saved the equivalent carbon emissions of over 132,000 cars on our roads every year. We must continue to strive for better and more far-reaching solutions; not to push the problem elsewhere.

Newly connecting LEUs will demonstrate the ways in which they improve the status quo. The scope within which LEUs may reduce carbon emissions reductions should not be limited. Those who clearly show active participation and measured results should be facilitated by relevant means including connection to the relevant energy systems.

Our sustainability initiatives, some of which are outlined above, make the Equinix investment in the Irish digital economy an exemplar solution for grid connected data centres.

[7] Refer to the Equinix Climate Neutral Data Centre Pact commitments – see https://www.equinix.com/newsroom/press-releases/2021/01/equinix-joins-european-cloud-and-data-center-providers-to-make-historic-pledge-towards-climate-neutrality-by-2030

10. Equinix responses to questions

In this section, we offer our responses to the specific questions raised in the consultation. In all cases, we aim to be constructive and collaborative, noting the scale of the challenge facing policy makers, regulators, and operators alike towards decarbonisation and climate change mitigation.

As stated in our introduction Equinix offers our available resources in support of CRU and others in facing up to this challenge.

3.1 Category of LEU to which this policy applies (pages 47 – 49)

Q1. Comments are invited from interested parties on the categories of LEU in electricity and gas to which this policy should apply (e.g. for electricity is DG10, DTS-T is appropriate, should DG6-DG9 be included, should the definition focus on capacity or usage, should a combination of criteria be applied?).

Distribution Connected customers should not be considered as LEUs in the context of this review.

The importance of distribution connected Equinix Retail IBX facilities locating within the Dublin metro cannot be understated. If connectivity of Distribution Connected customers in the constrained grid is a challenge in the short term, flexible connections should be offered with appropriate compensation for the flexibility provided and revert to firm connections once the grid is less constrained.

In general, we are of the view that energy users should be categorised by their energy use over time, i.e. megawatt-hours and not megawatts.

The review should have appreciation for the difference in the way the system is affected (both in terms of challenges and opportunities) by different user sizes. Positive, pro-active measures to drive de-carbonisation may be supported and achieved through the activities of XLEUs of all types. Where barriers need to be lifted or supports provided, these should be provided where the XLEU shows practical commitment to de-carbonisation.

Q2. Please provide views on whether this proposed policy should apply to capture smaller LEUs in due course, and if so which categories of LEU and on what timeline should this occur. Please provide rationale for any views shared.

An overemphasis on categorisation and segmentation of user types is not conducive to efficiently, effectively, and quickly meeting the decarbonisation agenda.

The CRU Demand Response consultation which focuses on the commercial mechanisms to incentivise demand customers to provide flexibility is the best method of delivering solutions for grid stability and integration of further renewable power generation.

3.2 Transition period (pages 49 – 54)

Q3. Comments are invited from interested parties on the proposed use of a transition period/glide path in relation to (i) the changing requirements at time of connection on the transition to zero real time

emissions, and (ii) once connected, the changing requirements as the project transitions closer to real time zero e.g. from non-firm connection to firm connection linked to milestones.

Demonstrating future net zero at connection application stage is impractical, so a transition period in line with Ireland's overall renewable targets is necessary.

Any CRU-mandated requirements for LEUs to demonstrate a path to net zero must be aligned with LEU's demand ramping schedule, rather than being solely based on the total requested MIC, reflecting the real-world demand profiles from initial connection.

Q4. Please provide views on the proposed timing of different options.

Real-time net-zero will not be appropriate or necessary for all LEUs to achieve a highly carbon-free system. We propose that demonstrating net zero as part of an application for a connection agreement should require the LEU to show commitment to contracting with a renewable project within a realistic timeframe (i.e., 3 years) but should not be dependent on the project being operational at the time of the LEU being connected to the grid.

Data centre development timelines are typically 3-4 years from conception (assuming smooth planning consents process), with ramping of demand thereafter. Some projects are further along this path than others. Some projects planning permissions in place but have not received a grid connection and hence cannot commence construction. The sector has had years of uncertainty – it needs a clear path to new connections and renewables now to enable future growth in line with renewables integration. It will take 3-4 years for a new LEU connections policy change to fully take effect in terms of future projects and predicted energy demand.

Any new CRU policy to be implemented today should consider the expected renewable power penetration in 2027 or 2028 when new this demand would begin to ramp up.

Q5. Should optionality be maintained in allowing a menu of different options to perspective LEUs, with the end net zero emissions target becoming more binding as the glide path advances?

Yes, optionality should be maintained in allowing a menu of different options to perspective LEUs as this will promote innovation and investment.

We strongly support the promotion of Corporate Power Purchase Agreements (CPPAs) in line with the Climate Action Plan and the Renewable Electricity Corporate Power Purchase Agreements Roadmap prepared by DECC.

Promotion of renewable generation in this way avoids burdening the general electricity consumer and provides and alternative route to market for renewable development with potentially improved investment returns. Accordingly, commitments to CPPAs must be considered in the assessment of the emissions of prospective connection applicants.

Q6. Comments are invited on how compliance and enforcement with required provisions can be effectively implemented in the operation of a transition period/glide path approach.

Compliance depends on clear definitions of requirements. Transparency in reporting of energy use and how this energy is covered from the perspective of renewable energy investments and production over the

time horizon.

As an example of where transparency will become available from data centres, please, refer to the Commission Delegated Regulation (EU) of 14.3.2024 on the first phase of the establishment of a common Union rating scheme for data centres and associated Annexes, which includes reporting on energy and sustainability, commencing on 15th September 2024.

3.3 Measuring performance (Pages 55 – 61)

An important consideration in the facilitation of CPPAs is the physical access to grid that must be provided respectively at the generator and off-taker sites. As activity relating to decarbonisation increases over time, within the electricity industry, we are conscious of the limitation and potential constraint in system operator resources. To address this issue along with others as referenced in this response, development of policy effecting the implementation of direct lines as per EU Electricity Directive (2019/944) and private wire as envisaged in Ireland's Climate Action Plan 2023 must be a priority.

Q7. Comments are invited on the approaches used to account for net zero emissions. This could include timestamped GOs or renewable certificates. Please provide reasons and rationale for any views provided.

Until we have broad consensus on the definition, technology, metrics and measurement tools for net zero, it is impractical and inadvisable to effect policy measure which require its immediate implementation. At this stage in the journey, we support policy measures which focus on advancement towards and readiness for net zero.

Methods to achieve net zero should be as practicable as possible, drawing on the fullest extent of the energy systems. Assessment of individual applications which focusses on the operations and activities relating only to the site of the proposed development may not accurately identify and evaluate the real net effect of a given development. The interconnectivity of data centres in particular gives rise to a cluster or community effect which requires more holistic evaluation. In this regard also, we refer to the section above on recognising and rewarding performance on the journey to net zero.

Consideration must be given to the direct and indirect effects that developers and operators of LEUs may have. Examples include: requirement for carbon efficient supply chain, multi-use facilities including energy generation, storage and demand including by third parties and the public (e.g. EV charging).

It is also important to recognise that some data centres are developed for single clients that the client often takes over the procurement of energy during operation. This transfer of responsibility for net zero accounting needs careful consideration.

Q8. Should the end target/goal be real time zero emissions? Do respondents have other suggestions as to how this can be demonstrated? Please provide reasons and rationale for any views provided.

No. It Shouldn't.

Real time zero emissions means Zero natural gas consumption in electricity production knowing that almost 50% of electricity production in Ireland comes from natural gas. Reaching that point may never be a realistic target based on actual resources and policies in Ireland.

Long term end target of Net Zero should be a global aggregate target and not real time measurement. What matters for the climate is the total amount of CO2 emitted over a period of time.

Reaching an aggregate Net Zero is a combination of:

- Carbon free energy production (Wind, Solar, Modern Nuclear)
- Large scale energy storage: Batteries, H2, Reversible Hydro
- Production of renewable gas: Methane, H2, and injecting into GNI grid
- Carbon capture for the remaining part
- Carbon offsetting with Carbon Tax
- ….

LEUs cannot solve this equation alone one by one, they can however, as aggregate, participate in financing utility scale programs going in that direction. Example:

- Signing CPPAs for Electricity & renewable Gas production
- Participating in financing Utility Scale Energy Storage
- Participating in financing Large Scale Interconnectors with France & UK
- Participating in financing Large Scale CC installations
- Maybe, in some cases, load shedding when possible
- ….

Q9. Comments are invited on the use of a glide path to implement the basis on which net zero emissions are determined. This could entail starting with measuring net zero performance on an annual basis and moving closer to more real time arrangements in incremental steps.

A key concern to LEUs is time to energisation for new renewable generation - lengthy timelines and high risk associated with grid connection and planning processes, as well as ill-defined and inconsistent dependencies between them. Policy across the relevant domains (planning, energy, etc) must focus on eliminating inefficiencies and counter-productive elements of application and offer processes.

Q10. Comments are invited on the use of self-reporting based on best available data/methodology and transitioning to a more robust formal framework over time when it becomes available.

As an example of where transparency will become available from data centres, please, refer to the Commission Delegated Regulation (EU) of 14.3.2024 on the first phase of the establishment of a common Union rating scheme for data centres and associated Annexes, which includes reporting on energy and sustainability, commencing on 15th September 2024.

Data Centres who are signatories to the CNDCP (Climate Neutral Data Centre Pact)[8] have put in place science-based targets globally to measure progress towards climate neutral. Equinix was one of the founding members of the CNDCP.

Q11. Comments are invited on the requirement for indigenous sources of renewable energy e.g. renewable electricity feeding into the Irish system and for gas secure sufficient renewable gas credits feeding into Irish system.

The benefits of renewable generation may be accessed to a greater extent using complementary technologies relating to energy storage and dispatchable generation, as is well demonstrated on the national grid. In consideration of the most effective deployment of renewables and supporting technologies,

[8] Climate Neutral Data Centre Pact on Data Centre (europa.eu)

policy must not be a constraining factor in allowing the technologies to work together.

Q12. Comments are invited on how the storage of renewable energy is captured by any measurement system when this stored renewable energy is used.

System-wide storage of electricity cannot account precisely for the source of generation. Best to allow market mechanisms which incentivise storage when renewable generation is high.

Q13. Comments are invited on whether the electricity and gas measuring and tracking systems should be integrated to help avoid double counting? If so, how might this be achieved?

Measurement and reporting should align with the requirements of the EU EED and CSRD requirements. Consideration should be made within the GHG protocol for a mechanism that allows for the increases in Scope 1 for the purposes of exported power/demand response. GHG emissions associated with meeting flex agreements / demand response should not be attributed to the company if it is not their primary business.

Q14. Comments are invited on who should have responsibility for measuring LEUs emissions and emissions abatement performance?

The roles of EPA, local authorities, system operators, an Bord Pleanála, and SEAI should be clearly delineated in terms of adjudicating on net zero performance.

i. The councils and An Bord Pleanála responsible for planning
ii. The SOs should be responsible for connecting LEUs, based on available power capacity in their location and in alignment with the principles in the Government statement on DCs
iii. EPA for Emissions Licensing
iv. SEAI for setting standards

There are sufficient existing and planned schemes for measuring data centre energy performance. The EU EED (Article 12) obliges the establishment of an EU performance database for data centres, with national data gathering by Government. The EU Climate Neutral Data Centre Pact provides further measurement by data centre operators.

We recommend a market-based approach, and as such SEMO should have a role. We should avoid duplication of systems when we can enhance proven, market-embedded solutions.

3.4 Location of LEUs (pages 61 – 65)

For some data centres, it is difficult to consider going outside of Dublin as the fibre network is not comparable (not fully designed or constructed) and the choice of Fibre Carriers is significantly reduced. We would recommend that CRU considers the type of digital workload and where this needs to be located in the context of the digital ecosystem in place in Dublin and Ireland.

Q15. Should new LEUs be located close to areas of renewable generation and/or storage or within energy parks? Please provide reasons and rationale for any views provided.

The location of "data centre" that is classified as a LEU should be sympathetic to type of functionality that the data centre provides and the potential for it to integrate with other infrastructure, not just power.

The way in which a prospective LEU proposes to interact with the grid, including reference to microgrid infrastructure, must be take into account, even prioritised. To illustrate, in a constrained area, one customer with 100 MW of genuinely flexible demand load is arguably better than one hundred customers with 1 MW non-flexible demand load.

Q16. What type of measures to facilitate this approach could be introduced to encourage new LEUs to locate close to renewable generation.

Designated zones for LEUs, based on existing campus development and, as applicable, areas which meet the locational requirements for new developments, which allow independently operated private networks and therefore more efficient use of shared generation and storage infrastructure with even greater opportunity to support the national grid and local communities should be considered.

Q17. Should there be any exemptions to locational requirements for certain LEUs? How could this be assessed? If so what type of connection conditions/requirements might these require?

Whereas we acknowledge the basis for requiring locational factors to be considered, for example where the electricity grid is constrained, we urge that balanced consideration is given to the constraints and requirements which drive the user's location.

As described earlier in this response, an Equinix IBX is unable to locate away from the Dublin metro for many reasons associated with the digital ecosystem we form the backbone of. Equinix IBX facilities are like a Digital Airport hub where all businesses interconnect to enable them to seamlessly communicate, transact and innovate. Colocation facilities should have an exemption from locational requirements which would involve locating outside of the Dublin metro area.

Q18. Comments are invited from interested parties on the level of proximity between LEUs and renewable generation? How should this be measured? Should this value apply across the board or be determined on a case-by-case basis?

As well as the grid support, which is discussed above in relation to this consultation, LEU size/scale introduces the possibility of local network support via the deployment of microgrid systems. With appropriate engagement and collaboration with local authorities, EirGrid and ESB Networks, LEUs could provide services and benefits well beyond what is possible under current regulations - private wire being a critical barrier.

Q19. 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?

Even if locational requirements are not introduced, we would welcome better integrated planning of the network, generation and demand.

Equinix calls for a wider working group to be established which enables the planning and design of the network, generation and demand in a collaborative way, while respecting the commercially sensitive aspects of corporate planning and strategies and respecting the roles of different authorities.

The roles of EPA, local authorities, system operators, an Bord Pleanála, and SEAI should be clearly delineated.

i. The councils and An Bord Pleanála responsible for planning
ii. The SOs should be responsible for connecting LEUs, based on available power capacity in their location and in alignment with the principles in the Government statement on DCs
iii. EPA for Emissions Licensing
iv. SEAI for setting standards

Q20. If introduced on a mandatory basis should locational requirements be implemented using a glide path?

Projects which have advanced planning and power applications in the Dublin area should be prioritised and allowed to be offered grid connections (the majority of which had their grid applications terminated by the DSO and TSO following the CRU Decision of November 2021 (CRU/21/124) in advance of any expectation of establishing new projects in non-proven locations.

3.5 Non-firm demand connections (Pages 65 – 69)

Q21.Should non-firm LEU connections be introduced? If so, should these non-firm connections be made on an enduring basis? Please provide reasons and rationale for any views provided.

Non-firm LEU connections for data centres have already been introduced. Our Equinix DB5 facility in Ballycoolin is the first fully-flexible data centre operation in Ireland. We were required to develop this system without any government incentives to do so. The non-firm nature of our connection agreement was the only driver. Our operation benefits the electricity grid by providing flexible demand. These benefits should be recognised and incentivised.

Incentives to engage in future flexibility schemes should provide sufficient financial returns to make the investment in flexibility projects viable and/or offer other incentives such as unlocking firm capacity on-site or at other sites owned by the customer.

We would like to highlight some operational challenges with the current EirGrid non-firm connections regime:

- We must respond in 5 minutes and for up to 500 hours per annum without any incentive. This compares to traditional connections where we might run generators for approximately an hour per quarter off grid unless an emergency or major fault occurred.
- The requirement incurs potential overtime for staff as most of the requests will come at peak time between 5pm-7pm Mon-Friday and our normal 12-hour engineer shifts are 7am-7pm daily.
- We are at risk if we are carrying out electrical / mechanical system maintenance at same time as the request to come off the grid is made.
- System checks are usually needed before and after we go off the grid to make sure there are no alarms or failures, requiring additional support from staff, incurring additional costs, etc.
- Even though it is supporting the wider grid stability needs, running on gas turbines under this mandatory requirement, is not environmentally friendly within the data centre campus itself. Emissions need to be covered by carbon credits as part of the EU-ETS scheme which incurs annual auditing and incurs additional costs.

The ESB Networks Beat the Peak scheme is incentivised. Consideration should be given to aligning these two schemes.

Q22. If non-firm LEU connections are implemented on a temporary/non-enduring basis what should trigger these connections being made firm? e.g. date(s) specified upfront, linked to certain requirements. Please provide reasons and rationale for any views provided.

Certainty of a future pathway to firm power would allow LEUs to make plans as to how they can deploy financially viable system supports.

System operators should be incentivised to speed up the reinforcement of the grid to enable firm connections faster. LEUs may be able to support this to a greater degree if sections of meshed grid were possible to develop contestably.

Q23. If non-firm LEU connections are mandatory in certain parts of the system, should there be any exemptions for certain LEUs? If so what type of connection conditions/requirements might these require?

Mandatory measures will place Irish divisions of international companies at a disadvantage compared to their peers. Rather than imposing mandatory flexibility requirements, we propose an approach that encourages overall demand flexibility in support of the whole energy system. A one-size-fits-all solution will not yield optimal results and does not align with the complexities of the energy system.

Q24. Comments are invited regarding the proportion of the LEU demand that would be connected on a non-firm basis. For example, would a non-firm connection apply to 100% of the connection, or would it apply to smaller portion than this?

If necessary to apply non-firm grid access, a sliding scale would be appropriate. Further comment depends on the definition on non-firm.

Q25. Comments are invited regarding what incentives could be applied to facilitate non-firm LEU connections. Should these incentives recognise the potential locational value of these?

Appropriate incentives will lead to better market outcomes. The greatest incentive will access to grid power in the first instance and then the speed at which a firm connection will be possible.

Q26. How should the SOs deploy this flexibility provided by non-firm demand?

Grid-based solutions could offer a meaningful way to achieve the objectives of matching renewables using flexibility and security of supply. They would also represent economies of scale with centralised projects into which LEUs could invest.

Existing mechanisms for electrical grid flexibility have presented some operational challenges for LEUs. These include the allowances for maintenance windows, risk of clashes with peak customer demand times, notice periods (currently circa 5 minutes).

Flexibility should be an optional service, made attractive by suitable incentives (carbon credits, payments, ease of participation, non-punishing).

Q27. Should non-firm/flexible electrical connections be provided to islanded LEUs in order to facilitate flexibility between the electrical and gas systems?

It seems that in the spirit of de-carbonisation, islanded loads operating on gas-fuelled electricity alone does not make sense (assuming slow advancement of renewable gas). By comparison, access to the electricity

grid alone would provide for a reduced carbon footprint for the same demand. However, an islanded load connected to the gas network which also has access to other energy from renewable sources (and storage) or provides export capacity to the grid at a time when capacity margins are tight, is worthy of facilitation.

We consider it appropriate to take into account the entire scope of the user's influence on decarbonised energy sources. To illustrate by example, we recognise how an (electrically) islanded load with 100 MW (electrical equivalent) gas connection, high efficiency gas generation, 10 MW onsite solar, 25 MW HVO contribution, 200 MW wind generation through carbon offset such as a CPPA-type arrangement would likely have a lower carbon intensity than a conventional 100 MW gas/electricity grid connected load with no renewable onsite generation or CPPA equivalents.

3.6 On-site generation and storage (Pages 69 – 70)

Q28. 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? Please provide reasons and rationale for any views provided.

We agree in principle that new LEU demand should be matched and offset by new renewable generation. This can be achieved for example via CPPA commitments and should not be required to be onsite with the LEU, particularly in metro areas where land requirements must be considered.

Regulatory clarity is required regarding onsite generation and storage by LEUs. High levels of capital and operational expenditure are required to support this endeavour and it is reasonable for a return on investment to be identified and achieved. Current regulatory regime requires LEUs to participate in various regulatory processes, e.g., CRM, ECP, DS3, which were not developed with LEU participation in mind. Lack of clear pathways to connection and participation could in the future give rise to inefficient engagement between operators and LEUs and potential for perverse outcomes that are not in the interest of the consumer, operators or suppliers.

Co-located application of energy generation, storage and demand is currently constrained by several factors including market rules, non-access to private networks, hybrid connections and unfit for purpose connection processes. New policy should remove these barriers in order that access to more sustainable, resilient, and economic solutions may be developed.

Whereas it can be possible to physically co-locate generation, storage and demand assets on single sites, the physical size and scale of the technology means we must allow assets at separate locations to be utilised in complementary arrangements. Grid developments should be advanced with this in mind going forward.

Application of multiple electrical and thermal generation, storage and load management technologies through LEU microgrids must be incentivised/prioritised. Barriers to scale, e.g., private wire, should be removed to allow more practical application in this area.

Q29. Should the use of on-site dispatchable generation using only renewable fuels have limited run hours, to reflect limited availability of an indigenous renewable fuel? Please provide reasons for any views provided.

The reality of the benefit of dispatchable generation to flexible demand and promotion of renewable

generation must be recognised. Natural gas should be permitted as an accepted transition fuel.

Use of low carbon fuel alternatives such as HVO, biomass and, in time, hydrogen from renewable energy, should be incentivised in connection policy.

Q30. Do LEUs require back-up generation for operational reasons? If so, what is the typical annual running hours of this back-up generation?

Yes, data centres must incorporate back-up generation capability to guarantee 99.999% uptime availability for customers.

Traditional connections will include back-up generation which run for approximately an hour per quarter off grid unless an emergency or major fault occurred.

Data centres typically have 24-hour on-site fuel storage, adapted upwards to reflect any increase in probability of run time due to increased unavailability of grid power.

3.7 Demand flexibility (Page 69 – 75)

We strongly support the promotion of demand flexibility in line with the Climate Action Plan. Where LEUs can show additionality of demand side response, whether at specific sites or elsewhere, this should be allowed in any relevant assessment.

As stated, the opportunity to provide flexibility through direct IT load reduction of our IBX facilities (i.e. reducing the power demand servicing our customers digital infrastructure) is limited due to the nature of our operations. However, Equinix would like to engage with the CRU and the SOs with a view to establishing ways in which this limited opportunity could be explored, and any benefits shared without the loss of necessary resilience in our operations. For example, where we install gas turbine capability and/or battery energy storage systems, these could provide behind the meter demand flexibility by replacing the power provided by the grid or by providing power back to the grid.

Consideration should be given to demand flexibility upwards to complement demand reduction. When supply is scarce, demand reduction may provide relief supported by deployment of energy storage. At times of generation oversupply, additional import capacity could facilitate battery charging for example, particularly at times of high renewable penetration. In this sense, we support the introduction of flexible demand which includes upward as well as downward flexibility.

In future, preference/high order of merit must be given to LEUs who can demonstrate a reduced emissions profile at a given time of dispatch.

Q31. What should demand flexibility services provided by new LEUs be used for, system support, decarbonisation or both? Please provide reasons and rationale for any views provided.

Both - fully utilising the dual benefit of infrastructure that has been installed by LEUs will reduce the requirement for additional investment from other stakeholders for system support and decarbonisation projects. It also improves the economics of investing and operating those assets for the LEU if suitably incentivised.

The system should also allow for flex upwards of contracted MIC to enable charging of battery energy storage systems. Presently there is no mechanism for LEUs to draw surplus renewables from the grid. This would help to avoid curtailment of renewable energy projects (which sits at around 15% of all renewable generation annually).

Whereas there are some opportunities to directly control demand to respond to changes in generation availability or other system needs, for many LEUs, especially data centres, they are somewhat limited. The ability to 'turn down' onsite energy consumption such as cooling systems is restricted by the physical operating characteristics of our systems. For example, we are constrained by the level and length of time servers and associated equipment may be subjected to higher temperatures.

Longer duration energy storage should be explored. However, we do not anticipate the same synergies with our operations as may exist with lithium-based batteries. The state of advancement of alternative long term storage technology is such that we expect that significant support in the form of subsidies and/or other incentives will be required to establish and advance the technology.

Q32. Should demand flexibility services be mandatory or voluntary for new LEUs? Please provide reasons and rationale for any views provided?

Any demand flexibility should be voluntary and incentivised for all LEUs. Ireland needs to remain a competitive location for the development of digital infrastructure.

We look towards the deployment of supporting technologies such that the demand that is seen at the point of connection is reduced.

Q33. Should LEU connections in certain parts of the network be required to provide demand flexibility services? Is this measure justified?

We agree that demand flexibility is a key enabler to decarbonisation of the energy system. However, we must achieve this whilst maintaining resilience, reliability, and economic efficiency. This is most effectively achieved through a microgrid system which allows us to operate in the most effective mode, having regard to grid system requirements, onsite demand requirements, emissions intensity and a host of other operational, environmental and commercial metrics.

Policy must avoid over-simplification of the topic as a matter of ramping down consumption or ramping up storage and rather the result of the most effective deployment of generation (including non-renewable where required), storage and demand.

Q34. If demand flexibility is voluntary for new LEUs, what type of incentives could be introduced to encourage the adoption of these services?

Financial incentives to reflect the cost of deploying flexibility systems. Carbon credit to reflect the requirement to deploy on-site baseload generation which avoids system-wide emissions. Fuel based incentives to recognise the carbon benefits of more sustainable fuel types such as hydrogen and biomethane.

Q35. If demand flexibility is mandatory for new LEUs, should there be any exemptions for certain LEUs to having to provide these services? How could this be assessed? On what basis could these exemptions be applied?

Any demand flexibility should be voluntary and incentivised for all LEUs. Ireland needs to remain a competitive location for the development of digital infrastructure.

Q36. Should timed/profiled connections be introduced? Please provide reasons and rationale for any views provided.

Ideally timed / profiled connections should not be introduced as this may place limitations to bringing new end customers onboard in a colocation data centre facility.

What would be beneficial is for the system operators to have an indicative demand profile from data centre developers in order to plan the network reinforcements in a more dynamic way.

3.8 Energy efficiency & District Heating (Pages 75 – 77)

Energy efficiency– Equinix strive to continuously improve the efficiency of our operations. From widening temperature setpoint bands to improving our operational PUE, we have ongoing programmes to evaluate and implement improvements on both the energy supply and demand aspects. This includes district heating initiatives, for which Equinix has recruited dedicated resources.

Q37. Comments are invited from interested parties on the use of waste heat from LEU sites.

Equinix has successfully implemented district heating in some of our European data centres. For example, Finland, Milan and Paris (the 2024 Olympics Swimming pool is heated with heat from an Equinix data centre).

We are open to exploring contribution to district heating (noting recent demonstration projects in the Dublin area) and storage. Likewise, we anticipate some limitation to the district heating use case due to the low grade of heat available and severely limited heat distribution infrastructure in Ireland today.

Our investment approvals committee needs to see a coherent offering with clear rules and obligations in order to approve projects.

Q38. Comments are invited on the use of waste heat from LEUs to feed district heating networks or other processes.

It is challenging and disruptive to expand heat networks over long distances so proximity of appropriate scale LEUs with energy users is important.

A means of quantifying the "value" of the heat needs to be established - looking at the proximity to existing or planned heat networks, the grade of heat (i.e. temperature), the demand for that heat in the proximal network, and the carbon content of the "waste" heat. Investment should be made to enable expansion of heat networks to connect high value heat consumers.

The seasonality of heat demand profile from heat networks does not match the continuous profile of DC operations. Summer demand is 10-20% of peak winter demand. Rather than making it mandatory across all LEUs, it should be strategic and intentional that "appropriate" LEUs that align with the long-term load growth (ramping) and load profile are matched. Not all LEUs will need to connect and heat network operators wish to maintain a diversity of sources of heat generation for resiliency.

Q39. Should provisions to use waste heat from new LEUs in suitable locations to feed district heating or other processes be mandatory or voluntary? Please provide reasons and rationale for any views provided.

The ability for LEUs to export heat into a District heating network is dependent on the availability of the distribution network and a suitable demand profile. It should be mandatory for network operators to prioritise investment in network infrastructure that enables utilisation of LEU low carbon heat when investment in new heat generation or decarbonisation projects are being evaluated.

3.9 Gas (Pages 77 – 87)

LEUs may require access to gas supplies for several purposes including, for example, onsite back-up generation or for demand side user market participation or even direct export to the grid (as derived from a holistic approach to most effective management of available onsite resources). We propose appropriate and respective treatment of gas demand arising from facilities which are supporting grid and market operations (e.g., DSU or dispatchable export) to that which is associated with single purpose gas-fired power generation facilities. In this sense, we propose separate treatment for gas which is providing service and benefits beyond the actual demand of the LEU.

There is no reason the Government Policy Statement cannot be complied with for the gas network, subject to all comments herein. Recognition and consideration of the important role that the gas network provides in the support of the electricity grid generation requirements should be acknowledged and accounted for.

Q40. Comments are invited from interested parties on the use of biomethane towards decarbonisation of LEU demand. Do respondents have a view on the volume of indigenous biomethane that can be produced annually? Do respondents have a view on the scalability of using biomethane towards the decarbonisation of LEU demand?

Consideration should be given to incentivisation of renewable gas and HVO, given its nascent stage of deployment relative to renewable electricity. We understand that the high cost of establishment of key infrastructure is a barrier to entry for providers and so policy should seek to reduce or subsidise these costs.

Whilst the volume of available renewable gas builds over time as the industry grows, we caution against overextended policy measures which place undue pressure on a growing industry or indeed are unachievable due to supply chain limitations.

Q41. Comments are invited on what running profile should be adopted by onsite gas generation which is being run on a limited supply fuel like biomethane e.g. should it be limited running for back-up and/or flexibility purposes, or baseload (islanded LEU). If for flexibility services what would be a typical capacity factor.

On-site generation using natural gas (including biomethane) should never be restricted to limited running. The technology is expensive to install and to run and is only justified on the basis of grid not being available. If it also carries uncertainty then there will be no business case to install it. Forced outages of gas would drive these facilities to run less sustainable solutions during such outages.

Q42. Comments are invited from interested parties on the use of green hydrogen towards decarbonisation of LEU demand and the timelines in which this might be viable. Please provide reasons and rationale for any views provided.

Green hydrogen is a future technology which will have limited bearing on connections policy in 2024. Where there is an opportunity for any connection, be it DSO or TSO connection to support the development of a market for hydrogen in Ireland this should be incentivised and promoted.

Q43. Comments are invited from interested parties on the renewable gas certification scheme.

GNI Should progress with developing the renewable gas certification scheme. The Irish biomethane market needs time to mature. Physical and virtual Imports of biomethane from EU and UK would help create market-pull and help to stabilise the price of biomethane by leveraging a more mature market.

UK sourced biomethane risks being eliminated from EU certification schemes. The Irish government should move to prevent this from happening, in light of our increasing dependence on the UK for gas. EU rules on country of origin for biomethane should be interrogated to clarify the status of imported GOs for biomethane.

Q44. Are there other options for decarbonisation of gas demand that should be considered?

No comment.

Q45. Comments are invited on the introduction of non-firm/interruptible gas connections for LEUs (at exit point). Do respondents have a view on whether these non-firm/interruptible connections can help alleviate emissions? Please provide reasons and rationale for any views provided.

Issues arise in the case of interruptible gas as for interruptible electricity. However, we see a need for greater caution in introducing such measures. Gas supplies which are used to fuel onsite generation in support of electricity grid connections as envisaged under CRU/21/124 are essential to the provision of a secondary or back-up source of electricity in the event of system needs. Their value in such scenarios would be undermined if subject to interruption.

In instances where gas supplies provide the basis for export to the grid, we do not believe it appropriate that such generation may be interruptible.

Furthermore, unavailability of gas supplied power may have the undesirable consequence of increasing the use of lesser efficient and more carbon intensive alternatives.

Q46. How can demand flexibility services on the gas system provide a benefit for both system support and decarbonisation?

As a means to provide generation during times of low renewables, the gas system can support more renewables on the grid.

3.10 Connection Considerations / Assessment criteria (Pages 87 – 90)

Q47. Comments are invited from interested parties on maintaining optionality in what provisions an LEU must meet as part of its net zero emissions requirements.

A menu of options should be available to LEUs. LEUs are corporate entities with individual global decarbonisation commitments and assessment criteria for projects. The CRU should aim to create the conditions whereby LEUs can drive decarbonisation whilst avoiding over-regulation or applying prescriptive solutions that may soon become outdated.

Q48. Comments are invited on how a new LEUs location may inform what criteria it may need to meet.

Location should not be an assessment criterion. Defining preferred locations also risks a rush in a given location.

Q49. Comments are invited on how a transition period may inform an evolving net zero target and demand flexibility services that could be provided.

Progress towards our national renewable energy targets will depend on investment certainty for renewable energy developers. LEU's are best placed to provide certainty of future demand, and to contribute to the flexibility required to integrate these renewable resources into the energy system. Pausing LEU development while waiting for renewable projects to develop sends a negative signal to investors. A transition period can provide a pathway for LEUs while we work together on developing policies and evolve sensible systems of measurement.

Q50. Respondents are welcome to suggest alternative approaches in how criteria is selected.

No comment

Q51. Respondents are welcome to suggest any additional approaches for LEUs to help meet net zero requirements not considered in sections above.

No comment

3.11 Roles of other organisations (Pages 91 – 94)

Q52. Comments are invited from interested parties on the roles of other organisations in the different approaches considered in this paper.

The roles of the local planning authorities, system operators, the EPA, SEAI etc should be clearly identified and delineated as they relate to the proposed policy going forward. State enterprise agencies should have an input as this policy impacts indigenous and FDI business directly.

Any assessment against evaluation criteria should be carried out by suitably qualified entities. Power system operators do not necessarily have the expertise to evaluate all potential criteria. Local authorities should not adjudicate on national energy issues as they do not have the expertise.

Q53. Comments are invited on what functions should be carried out by who, in the context of potentially real time net zero emissions for LEUs going forward.

We believe the currently licensed and respective system operators are best placed to preside over such tracking.

We recommend the recognition of existing measurement schemes in Ireland and the EU (The Climate Neutral Data Centre Pact, for instance). Development of time-stamped guarantees of origin scheme will provide an independently verified market mechanism. Self-assessment and sustainability claims could by verified by mandating certification to standards such as ISO50001 and/or ISO14001. The requirements of EU EED Article 12 reporting scheme might present oversight opportunities.

Q54. Feedback is requested from stakeholders on other mechanisms that may need to be considered for the implementation of SECs and who should be responsible for delivering them.

No Comment

ENDS