



An Coimisiún
um Rialáil Fóntais
**Commission for
Regulation of Utilities**

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Commission for Regulation of Utilities

CRU proposed Direction to the System Operators related to Data Centre grid connection

Consultation Paper

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CRU Mission Statement

The CRU's mission is to protect the public interest in Water, Energy and Energy Safety.

The CRU is guided by four strategic priorities that sit alongside the core activities we undertake to deliver on the public interest. These are:

- Deliver sustainable low-carbon solutions with well-regulated markets and networks;
- Ensure compliance and accountability through best regulatory practice;
- Develop effective communications to support customers and the regulatory process;
- Foster and maintain a high-performance culture and organisation to achieve our vision.

Executive Summary

Introduction

In the context of an evolving, significant, electricity security of supply risk, the CRU is minded to issue a Direction to the System Operators (SOs, EirGrid & ESBN) regarding the processing of connection applications and subsequent connection of data centres at both the transmission and distribution levels of the electricity grid.

The purpose of this paper is to outline for consultation the proposed criteria against which the SOs will continue to process and connect data centres to the grid, in order to mitigate some of this risk.

Stakeholders are asked to provide their views on the proposed criteria and provide alternatives where they see fit. A copy of the proposed Direction to the SOs is attached (Appendix 1)

Context

Through numerous interactions with EirGrid¹ it has become apparent to the CRU that data centres and the demand load they require, are having a major impact on the Irish electricity system currently and into the foreseeable future. When this is also considered in the context of wider system security including greater insight into the delivery of generation through the Capacity Remuneration Mechanism pipeline, short term security of supply challenges and the broader public interest, it is clear that measures must be implemented in order to encourage data centres to address some of these risks.

Data centres can bring benefits to the Irish economy. However, as large consumers of electricity, they can also pose a particular challenge to a sustainable and secure power system. The unique nature of data centres has previously been recognised through the development of a bespoke Data Centre Connection Offer Policy by EirGrid, which has been in operation with the data centre development community over the past number of years.

Next Steps

The CRU is seeking comments from interested parties on the options outlined in this paper.

¹ EirGrid letter to CRU relating to Data Centre connections, 27 May 2021. Please see Appendix 2

Responses should be submitted to electricityconnectionpolicy@cru.ie by Wednesday 7 July 2021. Once responses have been received, reviewed, and considered, the CRU will set out its decision in due course.

Public/Customer Impact Statement

What is Security of Electricity Supply?

Security of Electricity Supply or **Security of Supply (SoS)** refers to the **electricity** industry providing appropriate **electricity** system capabilities to maintain normal **supply** to consumers. These capabilities are in the form of generation and transmission capacity which system operators use to meet electricity demand.

What is a Data Centre?

A **data centre** is a facility that centralizes an organization's shared Information Technology (IT) operations and equipment for the purposes of storing, processing, and distributing data and applications.

Data centres can bring benefits to the Irish economy, however, as large consumers of electricity, data centres pose a challenge to a sustainable and secure power system. It is the CRU's intention to work with EirGrid and through this consultation, the data centre community, to develop a range of measures to ensure that objectives such as decarbonisation, local and regional security of electricity supply are achieved alongside economic development, while also balancing the need for adequate protection of end user costs. Without mitigation, these objectives will be difficult to achieve in the context of rapid demand growth of data centres; the typically large energy use of each data centre; and the current low level of flexibility of data centres with regard to their demand.

EirGrid has consulted on data centre connection offer policy papers in recent years. These policy papers were issued in June 2019² and July 2020³ and an information note on Flexible Demand for Data Centre customers was provided to relevant customers in March 2021. EirGrid keeps policy under review as the data centre industry is dynamic and continues to evolve.

In its recent letter to the CRU (See Appendix 2), EirGrid outlined its concerns in relation to offering further connection offers to connect data centres under the current policy and highlighted the potential impact on the worsening security of supply situation. The CRU is

² Data Centre Connection Offer Policy and Process Version 1; <https://www.eirgridgroup.com/site-files/library/EirGrid/Data-Centre-Connection-Offer-Process-and-Policy-paper.pdf>

³ Data Centre Connection Offer Policy and Process Version 2; https://www.eirgridgroup.com/site-files/library/EirGrid/Data-Centre-Connection-Offer-Process-and-Policy_v2_July-2020.pdf

seeking, through the proposed direction, to protect electricity consumers and Security of Supply while continuing to connect data centres to the electricity system (See Appendix 1).

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Glossary of Terms and Abbreviations

Abbreviation or Term	Definition or Meaning
CRU	Commission for Regulation of Utilities
CRM	Capacity Renumeration Market
DBEI (now DETE, Department of Enterprise, Trade and Employment)	The Department of Business, Enterprise and Innovation
DCCOPP	Data Centre Connection Offer Policy and Process
DSO	Distribution System Operator (ESBN)
GCS	EirGrid's All-Island Generation Capacity Statement 2020 - 2029
GWhrs	GigaWatt-hours
MW	MegaWatts
MVA	MegaVolt-Amperes
SO	System Operator (EirGrid/ESBN)
SoS	Security of Supply
TSO	Transmission System Operator (EirGrid)

1. Introduction

1.1 Commission for Regulation of Utilities

The Commission for Regulation of Utilities (CRU) is Ireland's independent energy and water regulator. The CRU was originally established as the Commission for Electricity Regulation (CER) in 1999. The CRU's mission is to protect the public interest in Water, Energy and Energy Safety. The work of the CRU impacts every Irish home and business. The sectors the CRU regulates underpin Irish economic competitiveness, investment and growth, while also contributing to our international obligations to address climate change.

The CRU is committed to playing its role to help deliver a secure, low carbon future at the least possible cost, while ensuring energy is supplied safely, with empowered and protected customers paying reasonable prices and the delivery of a sustainable, reliable and efficient future for energy and water.

The CRU is guided by four strategic priorities that sit alongside the core activities the CRU undertakes to deliver on the public interest. These are:

- Deliver sustainable low-carbon solutions with well-regulated markets and networks;
- Ensure compliance and accountability through best regulatory practice;
- Develop effective communications to support customers and the regulatory process;
- Foster and maintain a high-performance culture and organisation to achieve our vision.

Further information on the CRU's role and relevant legislation can be found on the CRU's website at www.cru.ie.

1.2 Background

According to the Department of Business, Enterprise and Innovation's⁴ (DBEI) "Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy", published in June

⁴ The Department of Business, Enterprise and Innovation (DBEI) is now the Department of Enterprise, Trade and Employment (DETE)

2018, the development of data centres in Ireland is a key aspect in promoting Ireland as a digital economy hot-spot in Europe⁵.

While data centres have the potential to benefit the economy, the large increase in electricity demand that accompanies the connection of data centres poses significant challenges to Ireland's electricity network and security of supply.

The CRU and EirGrid have held numerous discussions recently where the major challenges associated with the high levels of Data Centre development anticipated for the coming years has been highlighted. The CRU considers that some form of intervention is necessary at this stage to maintain the security of the electricity system.

The rationale for this consideration is explained further in the sections below. The CRU notes that there are a range of technologies, and behaviours, that can be adopted by data centres and data centre developers in Ireland which can mitigate some of the challenges that this sector brings. This proposed Direction is intended to allow the data centre community to collaborate with the System Operators and contribute to the mitigation of these challenges.

1.3 Purpose of Paper

The purpose of this paper is to outline for consultation, the proposed criteria by which the SOs will process and connect data centres to the grid. Stakeholders are asked to provide their views on the proposed criteria and provide alternatives where they see fit. A copy of a proposed Direction to the SOs is attached (Appendix 1)

⁵ Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy;
<https://www.enterprise.gov.ie/en/Publications/Publication-files/Government-Statement-Data-Centres-Enterprise-Strategy.pdf>

2. Policy

2.1 Policy Context

The CRU has an overarching statutory function to ensure security of supply of the electricity system for all consumers. The CRU is concerned that continuing to allow data centres to connect in accordance with current arrangements will significantly impact the ability of the electricity system to meet the reasonable demands of all consumers including data centres.

When the system cannot meet the demand required the system operators are required to take measures which can include load shedding whereby customers could be without power for periods of time. As a consequence, the CRU considers that it is necessary and proportionate to issue directions which promote and maintain the continuity, security and quality of supplies of electricity in the context of these issues whilst facilitating the continued connection of data centres to the greatest extent possible.

In addition to the most recent correspondence, the CRU notes that EirGrid has outlined the expected electricity demand and generation for the coming ten years within EirGrid's *All-Island Generation Capacity Statement (GCS) 2020-2029*. This is also reflected in the most recent draft of the updated GCS, in which EirGrid has identified generation deficits for the coming years if the current level of demand growth continues. This medium-term risk is exacerbated by recent outages and drop-offs in the delivery of successful Capacity Remuneration Market (CRM) related generation projects, resulting in a significant increase in supply risk in the short term.

EirGrid has estimated that data centre demand will be a key driver for electricity demand in Ireland for the foreseeable future. The CRU recognises that this forecasted rapid growth in demand comes at a time when Ireland's electricity network is undergoing fundamental changes to facilitate a low carbon future. Ireland's Climate Action Plan 2019⁶ has set a target of achieving 70% of electricity demand from renewable energy sources by 2030. Older, conventional fossil fuel powered generation is being retired and replaced by new renewable energy sources.

⁶ Climate Action Plan 2019; <https://www.gov.ie/en/publication/ccb2e0-the-climate-action-plan-2019/>

According to the most recent draft GCS, it may not be possible to secure sufficient generation capacity with the necessary certainty to meet the projected rapid increase in electricity demand in the coming years and it is evident to the CRU that additional intervention is necessary now to ensure that security of supply is maintained. After this winter 2021/22, the CRU intends to carry out a wider review of the assumptions underpinning capacity requirements and forecasted demand to better understand demands of the electricity system for the medium to longer term.

The CRU as an economic regulator also recognises that the electricity system is a capital-intensive system which requires long term foresight and planning. Investments made in the electricity system are often sunk and irreversible. The energy consumer invests in the development of the electricity system through Use of System charges. When generation is procured to meet projected demand based on the latest GCS estimations, this is delivered through the Capacity Remuneration Mechanism of the Single Electricity Market, with the energy consumer the ultimate counterparty.

Due to the rapid, disproportionate impact the increase in data centre connections has compared to other sectors of large energy user industries, the supply security and financial risk to the energy consumer is increased.

Evolving government policies and incentives have a significant impact on the attractiveness of Ireland as a location for data centre connections. Other countries have the potential to become more attractive based on evolving policies and incentives. The expected pipeline of data centre projects may be impacted by such changes which would undermine the estimations made in the GCS, to plan and procure sufficient generation to meet expected future demand. The uncertainty of the lifespan of data centres also adds to the risk of over-procuring generation and leaves the energy consumer bearing a disproportionate risk for any potential shortfall.

As part of the CRU's Strategic Plan 2019- 2021, one of our main objectives is to "*proactively and transparently place the public interest at the centre of the CRU's policy development. Ensure the customer's voice is heard and reflected in CRU decisions.*" Provisions must be put in place to ensure that the risk of over-procurement of generation is mitigated and the financial risk to the energy consumer is managed to a proportionate level, in addition to managing the security of supply risk to the consumer.

The CRU understands that data centres have demonstrated, in other jurisdictions, their ability and willingness to be flexible when there is a need for flexible demand on the system, on an enduring basis. By way of example, some data centres in other jurisdictions have been able to change some of their processes so that they run at night to avoid peak demand.

The CRU considers that data centres, as the single largest homogenous demand driver, now need be flexible and to demonstrate this by providing solutions to enable further grid integration while respecting the ultimate need to maintain security of supply and protect the public interest.

2.2 Data Centre Demand

Information provided by EirGrid shows that data centres are the largest demand driver out of all the demand connected customer groups. The rate at which data centres are seeking to grow their load is unprecedented in Ireland. Over the last 4 years EirGrid have seen annual increases in demand usage of around 600 GWh from data centres alone – equivalent to the addition of 140,000 households to the power system each year. This contrasts starkly to demand growth in other sectors outside of the data centre industry, which have been largely flat in recent years.

EirGrid’s latest range of forecasts for data centre connection applications are shown below; this shows a significant increase in demand growth over the next 10 years. The table below also includes a forecast which excludes data centre growth.

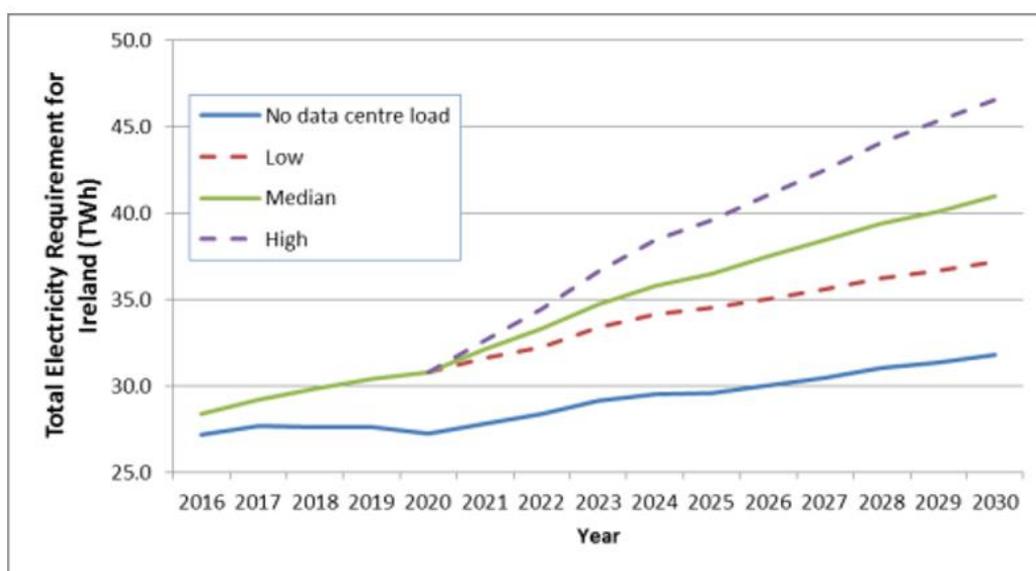


Figure 1: Data centre demand forecasts against average growth forecasts. Source: EirGrid

The median demand forecast predicts data centres accounting for 25% of all demand by 2030. This increases to 33% in the high demand forecast. This represents a current forecast position; it does not include all of the most recently received data centre applications seeking connection, discussed below.

EirGrid has outlined that Connection Agreements are already in place for over 1,800 MW of MIC for data centres, with up to 2,000 MW of additional requests received. Ireland has a current demand peak of around 5,500 MW. Approximately 1,000MW of this has been received within the last year as shown in graph below.

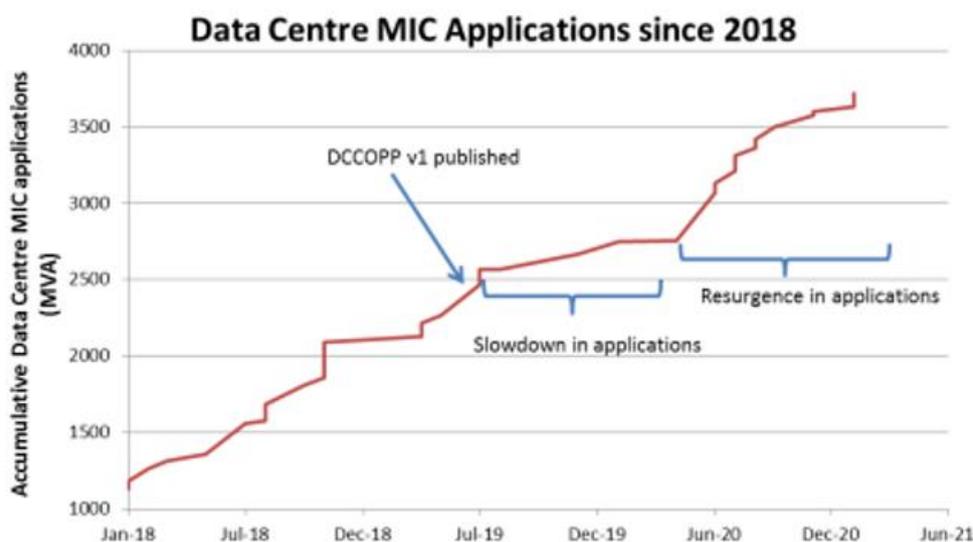


Figure 2: Data centre applications and corresponding load demand since 2018. Source: EirGrid.

Many of these data centres have accessed, or are seeking to access, extremely large loads at one specific site. To put this demand load in context, a data centre with a load of 60 MVA would be comparable to the load usage of a large town/small city such as Kilkenny.

It is clear therefore that data centres are having an impact on the Irish electricity system, and on the meeting of the reasonable demands by the system that is not comparable to any other industry, or indeed all other industries combined.

In the absence of data centres, Ireland would be experiencing much more modest electricity demand growth, consistent with population growth, general economic development and the general development of industrial demand.

Ireland is not alone in facing these challenges. Other countries have had to employ specific and differentiated measures to address the impact of data centre demand growth. For example, the CRU understands that Amsterdam halted the issuance of building permits for data centres in certain parts of the city due to concerns relating to grid capability. Also, Singapore imposed a moratorium on the building of new data centres in 2019.

2.3 Legal Context

The legal framework within which the CRU has regard to issuing directions is as follows:

- Section 34 of the Electricity Regulation Act 1999 (the “**Act**”) the CRU has the power to issue directions to the system operators from time to time including for the range of purposes set out in Section 34 (2), and the system operators shall comply with such directions. Under Section 34 (2) directions given by CRU may provide for, inter alia:
 - i. the terms and conditions upon which applications for an agreement [for connection] are to be made and the period of time within which an offer or refusal pursuant to an application is to be made by the Board; and
 - ii. any other matters which the CRU considers necessary or expedient for the purpose of making an offer for connection to or use of the transmission or distribution system.
- Section 9 (3) of the Act provides that it is the duty of (inter alia) the CRU to carry out its functions and exercise the powers conferred on it under the Act in a manner which, in relation to electricity, does not discriminate unfairly between holders of licences, authorisations and the system operators, or between applicants for authorisations or licences. Sections 9 (4) and (5) require the CRU in the carrying out of its duties to have regard to a range of matters, the most pertinent of which for the purposes of this direction are contained at sub-paragraphs (e), namely to promote the continuity, security and quality of supplies of electricity and (f) to promote the use of renewable, sustainable or alternative forms of energy. Lastly,
- Article 28 the European Communities (Internal Market in Electricity) Regulations 2005 sets out the CRU’s duty in respect of the security of supply of electricity, including (at Article 28(5)) the taking of such measures as it considers necessary to protect security of supply.

3. Mitigation options considered

Demand on the system is becoming ever greater. Managing the transition to a more flexible system requires measures to primarily maintain security of supply while connecting new load to the system in the most efficient manner.

EirGrid have highlighted the considerable challenge the electricity consumer faces over the coming years. The worst outcome of which could result in load shedding and ultimately rolling blackouts. This is not acceptable to the CRU and measures need to be introduced to manage the supply demand balance.

Therefore, the CRU is working with EirGrid to identify appropriate short, medium and long terms measures to ensure supply can meet all reasonable demands.

The CRU considers that data centres, as the single largest homogenous demand driver, now need to be flexible and to demonstrate this by providing solutions to enable further grid integration while respecting the ultimate need to maintain security of supply and the public interest.

The CRU has considered the following options regarding managing data centre connection demand.

3.1 Do Nothing

In this scenario, the Data Centre Connection Offer Policy and Process (DCCOPP) would continue as is. This will likely result in a situation where demand outstrips available supply at the peak. This will result in load shedding and consumers facing rolling blackouts. This is not an acceptable situation to the CRU.

3.2 Moratorium on Data Centre Connections

In this scenario CRU could issue a Direction to the system operators to cease processing all data centre connection applications (including modifications) and new connection applications for a number of years. The CRU does not consider this appropriate at this time as there are mechanisms that data centres can employ which in the CRUs view can contribute to their overall flexibility.

3.3 Connection Measures

In this scenario the CRU proposes to Direct EirGrid and ESBN as the system operators to implement the following measures with respect to the terms and conditions it may specify for all connection applications received from data centres (whether inside or outside the greater Dublin region):

- (a) EirGrid and ESB Networks shall prioritise the processing of data centre connection applications based on;
- the location of each data centre applicant with respect to whether they are within a constrained or unconstrained region of the electricity system;
 - the ability of each data centre applicant to bring onsite dispatchable generation (and/or storage) equal to or greater than their demand, which meets appropriate availability and other technical requirements as may be specified by EirGrid, in order to support security of supply;
 - the ability of each data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the TSO in times of system constraint through the use of dispatchable on-site generation (and/or storage) which meets appropriate availability and other technical requirements as may be specified by EirGrid, in order to support security of supply;
 - the ability of each data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the TSO in times of system constraint, in order to support security of supply;
- (b) EirGrid & ESBN shall apply the above prioritisation for data centre connection applications on an Ireland wide basis.

The above measures are not currently ranked. Following conclusion of the consultation the CRU may decide to include a prioritisation for the purposes of any Direction.

Option 3 “Connection Measures” is intended to allow the data centre community to collaborate with the System Operators and contribute to the mitigation of the spiralling demand and security of supply issues.

The CRU considers option 3 as the most balanced and necessary approach and is the preferred option of the CRU. This option should allow the data centre industry to continue to connect in a manner which respects the overall system integrity while balancing the needs of the consumer to have a secure and stable supply of electricity. The CRU notes that there are a range of technologies, and behaviours, that can be adopted by data centres and data centre developers in Ireland which can mitigate some of the challenges that this sector brings. The CRU is aware that in other jurisdictions, Data Centres are examining options to manage their load and peak demand on the system. One such example is data centres matching their energy use to the availability of renewable sources.

The CRU recognise that the above measures may not work for all data centres but the CRU must act now to protect the electricity system. A copy of a proposed direction is appended to the paper for illustration.

Consultation question for stakeholders:

The CRU considers option 3, Connection Measures, (and its publication in the context of a public consultation) as a necessary and proportionate course of action within the context of significant security of supply issues the electricity network is facing.

Please provide views on the options outlined above and offer alternative solutions if you do not agree with the CRU's minded to direction.

4. Next Steps

Following the consultation period, the CRU will make a decision on most appropriate measures to be implemented. Stakeholder responses on the options outlined in section 3 and any other options are welcome.

Responses should be submitted to electricityconnectionpolicy@cru.ie by Wednesday 7 July 2021.

4.1 Related Documents

- [Data Centre Connection Offer Process and Policy \(DCCOPP\) Version 1](#) – Eirgrid's Eirgrid's Data Centre Connection Offer Process and Policy Version 1.0, 12 June 2019;
- [Data Centre Connection Offer Process and Policy \(DCCOPP\) Version 2](#)- Eirgrid's Data Centre Connection Offer Process and Policy Version 2.0, 17 July 2020;
- [All-Island Generation Capacity Statement 2020 – 2029](#) – Eirgrid's All-Island Generation Capacity Statement 2020 – 2029, 27 August 2020;
- [Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy](#) - Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy, 07 June 2018;

4.2 CRU Disclosure Requirements

Unless marked confidential, all responses from companies or organisations may be fully published on the CRU's website. Respondents may request that their response is kept confidential.

The CRU shall respect this request, subject to any obligations to disclose information. Respondents who wish to have their responses remain confidential should clearly mark the document to that effect and include the reasons for confidentiality.

Responses from identifiable members of the public will be anonymised prior to publication on the CRU website unless the respondent explicitly requests their personal details to be published.

The CRU privacy notice sets out how it protects the privacy rights of individuals and can be found [here](#).

Appendix 1: Proposed Direction Letter to EirGrid PLC and ESNB DAC relating to Data Centre Connections

Mark Foley
Chief Executive Officer
EirGrid plc
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D04 FW28

Paddy Hayes
ESB Networks DAC
Clanwilliam House,
Clanwilliam Court,
Dublin 2
D02 Cv61,

2021

Our Ref: **XXXXXX**

Re: Data Centre Grid Connection – CRU Direction to maintain security of supply

Dear Mark, Paddy,

On 27 May 2021 EirGrid wrote to the Commission for Regulation of Utilities (CRU) in relation to its concerns arising from the continued growth in data centre demand and applications for connection in confluence with a number of other system events. This follows on from a number of engagements and [correspondences]⁷ from EirGrid over a number of months. A copy of this letter is attached to the Appendix to this Direction. EirGrid has highlighted the background and context for its concerns, and the nature of the engagements that it has had, and continues to have, with industry and customers. In that context, EirGrid has implemented the Data Centre Connection Offer Policy and Process (“**DCCOPP**”) policy paper to facilitate the connection of data centres, under which measures taken include:

- (a) implementing flexible demand options in certain constrained regions in advance of necessary generation and/or transmission infrastructure being in place; and
- (b) providing firm capacity for data centres where on-site dispatchable generation is made available to EirGrid to address constraints in the greater Dublin region.

EirGrid has outlined the expected electricity demand and generation for the coming ten years in its *All-Island Generation Capacity Statement (GCS) 2020-2029* and, in doing so, EirGrid has identified and projected that data centre demand growth is rapid, at substantial scale and

disproportionate as compared to the demand growth of other large energy intensive industries. The CRU and EirGrid consider that data centre connections are the single largest driver of additional electricity demand.⁸

The forecasted rapid growth in demand coincides with Ireland's electricity network undergoing fundamental changes to facilitate a low carbon future. Ireland's Climate Action Plan 2019 set a target of achieving 70% of electricity demand from renewable energy sources by 2030. Older, conventional fossil fuel powered generation is being retired and replaced by new renewable energy sources. This is also reflected in the most recent GCS, in which EirGrid has identified generation deficits for the coming years if the current level of demand growth continues as it may not be possible to secure sufficient generation capacity with the necessary certainty to meet the projected rapid increase in electricity demand without additional measures. [This creates a fundamental security of supply risk.]⁹ However, data centres can bring on-site generation and/or storage, the dispatch of which reduces its demand. Therefore, data centres that can make use of such generation can support security of supply.

In addition to generation adequacy on a system wide basis, location is a critical factor: there are regional security of supply issues connected to the rapid increase in demand by data centres. Addressing these¹⁰ issues necessitate investment in generation in those constrained regions or, as data centres connect to both the transmission system and the distribution system, increased transmission and distribution capacity in those regions. In the near term and as a first measure, it is proposed to prioritise applicants in terms of their location, as to whether they are in a constrained or unconstrained region.¹¹

Data centre load can be flexible. Given the variable nature of renewables, for security of supply purposes there is a general need for flexible demand on the electricity system on an enduring basis to enable Ireland meet its targets for renewable generation while preserving security of supply. In circumstances where continuing to allow data centres to connect on a firm basis and in constrained regions will have an adverse impact on security of supply, part of the solution is to prioritise applicants who can provide flexibility in their demand by reducing consumption where required by EirGrid at times of system stress.

Lastly, as part of the CRU's Strategic Plan 2019-2021, one of our main objectives is to *"proactively and transparently place the public interest at the centre of the CRU's policy development. Ensure the customer's voice is heard and reflected in CRU decisions."*

Consequently, in light of the capital intensive nature of the system, the investment in which is funded by system users, we are concerned that any risk of over-procurement of generation is mitigated and the financial risk to the energy consumer is managed to a proportionate level.

In summary, security of supply is increasingly at risk, in significant part due to the considerable increase in data centre demand. There are many interfacing elements to the security of supply risk, but at its core is the interplay of scarcity of generation capacity and the scale and speed of the new demand seeking connection in constrained regions. Accordingly, the CRU is of the view that intervention is necessary and appropriate, and the terms of this direction are proportionate to the circumstances.

The legal framework within which the CRU has taken the decision to issue this direction is as follows: under Section 34 of the Electricity Regulation Act 1999 (the “**Act**”) the CRU has the power to issue directions to the system operators from time to time including for the range of purposes set out in Section 34 (2), and the system operators shall comply with such directions. Under Section 34 (2) directions given by CRU may provide for, inter alia:

- iii. the terms and conditions upon which applications for an agreement [for connection] are to be made and the period of time within which an offer or refusal pursuant to an application is to be made by the Board; and
- any other matters which the CRU considers necessary or expedient for the purpose of making an offer for connection to or use of the transmission or distribution system.

Section 9 (3) of the Act provides that it is the duty of (inter alia) the CRU to carry out its functions and exercise the powers conferred on it under the Act in a manner which, in relation to electricity, does not discriminate unfairly between holders of licences, authorisations and the system operators, or between applicants for authorisations or licences. Sections 9 (4) and (5) require the CRU in the carrying out of its duties to have regard to a range of matters, the most pertinent of which for the purposes of this direction are contained at sub-paragraphs (e), namely to promote the continuity, security and quality of supplies of electricity and (f) to promote the use of renewable, sustainable or alternative forms of energy. Lastly, Article 28 the European Communities (Internal Market in Electricity) Regulations 2005 sets out the CRU’s duty in respect of the security of supply of electricity, including (at Article 28(5)) the taking of such measures as it considers necessary to protect security of supply.

The CRU has to make a judgement and, to some extent, a reconciliation between competing objectives. In making this judgement in this instance, the CRU has followed the general principle for the purpose of this direction that any obligations or restrictions on data centres seeking connections should be necessitated by the need to protect system stability and reliability. Such measures should also be proportionate to the potential threat to system safety,

stability and security posed by a continuation of the projected increase in such connections. In this regard, although data centre connections are the single largest driver of additional demand at a time of security of supply concerns, the CRU considers it appropriate to continue to facilitate data centre connections to both the transmission system and the distribution system provided that such connections facilitate flexible demand and are not exacerbating supply issues in constrained regions.

The CRU hereby directs EirGrid and ESB Networks pursuant to Section 34(1) of the Act, to implement the following measures with respect to the terms and conditions specified for all connection applications received from data centres (whether inside or outside the greater Dublin region):

- (a) EirGrid and ESB Networks shall prioritise the processing of data centre connection applications based on;
 - the location of each data centre applicant with respect to whether they are within a constrained or unconstrained region of the electricity system
 - the ability of each data centre applicant to bring on site dispatchable generation (and/or storage) equal to or greater than their demand, which meets appropriate availability and other technical requirements as may be specified by EirGrid, in order to support security of supply.
 - the ability of each data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the TSO in times of system constraint through the use of dispatchable on-site generation (and/or storage) which meets appropriate availability and other technical requirements as may be specified by EirGrid, in order to support security of supply;
 - the ability of each data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the TSO in times of system constraint, in order to support security of supply;
- (b) EirGrid & ESN shall apply the above prioritisation for connection applications for data centres on an Ireland wide basis.

EirGrid is directed to revise the DCCOPP including as necessary to address the requirements of this direction set out above. In addition, EirGrid must be cognisant of whether further large scale transmission infrastructure will be necessary to connect further data centres in constrained regions before making any further connection offers to data centres.

The CRU further directs EirGrid to monitor the implementation of the above measures and to notify the CRU if in EirGrid's opinion such measures are sufficiently mitigating the risks outlined in their letter of 27th May 2021. A review of this Direction will take place in the context of the following *inter alia* :

- a) Results in forthcoming Capacity Remuneration Mechanism (CRM) auctions.
- b) The overall capacity outlook, informed by EirGrid projections.

- c) The demonstrated contribution of data centres to security of supply during Ireland's low carbon transition over the forthcoming period, including in the context of the prioritisation criteria identified above.

The CRU will review this Direction and the ongoing need for it no sooner than 1 April 2023.

Further to the above the CRU expects that EirGrid and ESB Networks will take into consideration the overall principles set out in this letter regarding the importance of security of supply and the facilitation of 70% of electricity demand from renewable energy sources by 2030 in its implementation of this direction. In addition, it will be important that EirGrid and ESB Networks are cognisant of whether further large scale transmission infrastructure would be necessary to connect further data centres in constrained regions before making offers for same.

Yours sincerely,

Jim Gannon

Commissioner

Appendix 2: EirGrid letter to CRU relating to Data Centre Connections

Ms. Karen Trant

Director of Energy Networks and Legal

The Commission for Regulation of Utilities

Belgard Square North

Tallaght

Dublin 24, D24 PXW0

By Email: ktrant@cru.ie

27 May 2021

Re: Ireland's Data Centres - Next Steps

Dear Karen,

I am writing to you following the extensive engagement between the CRU and EirGrid on security of supply matters for Ireland's electricity system and the role of data centres in this context.

These engagements go back to the development of the paper of principles relating to data centres issued to the CRU in 2018 titled "*Accommodating Ireland's Increased Electricity Demands in the Context of the Data Centre Paradigm*" and our development, in consultation with yourselves, of the current Data Centre Connection Offer Policy and Process (DCCOPP) policy paper. However, as set out in this letter, with the continued growth in data centre demand and applications for connection, in confluence with a number of other system events including the transition of the power system and the conventional plant portfolio, it is timely to take stock and to consider whether current measures are adequate and/or whether further measures or interventions are necessary.

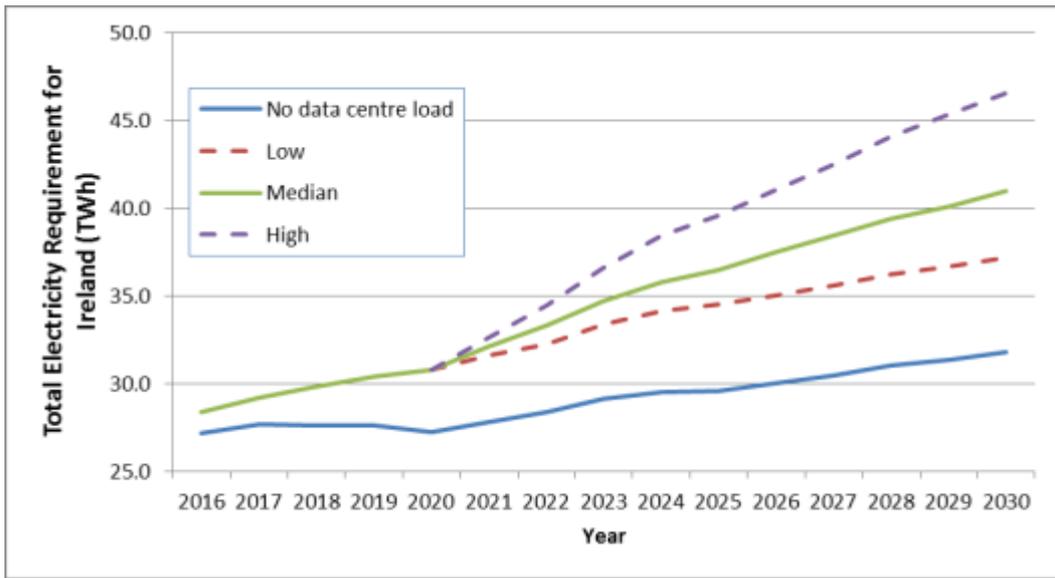
EirGrid has the obligation to plan, operate and develop, where necessary, a safe, secure, reliable, economic and efficient transmission system with a view to ensuring all *reasonable demands* for electricity are met (emphasis added). The transmission system has to date generally been able to accommodate the requests for new demand growth. Where it has not initially been able to do so, further proportionate investment in transmission infrastructure has enabled it, and enabled it in a relatively timely and expeditious fashion.

However the transmission system alone does not enable the load to be supplied in a safe, secure and reliable manner – rather it represents only a pathway. Adequate generation and generation capacity is also necessary. There is now, however, a well signalled generation scarcity and we are facing a more acute security of supply situation than we have had in the recent past.

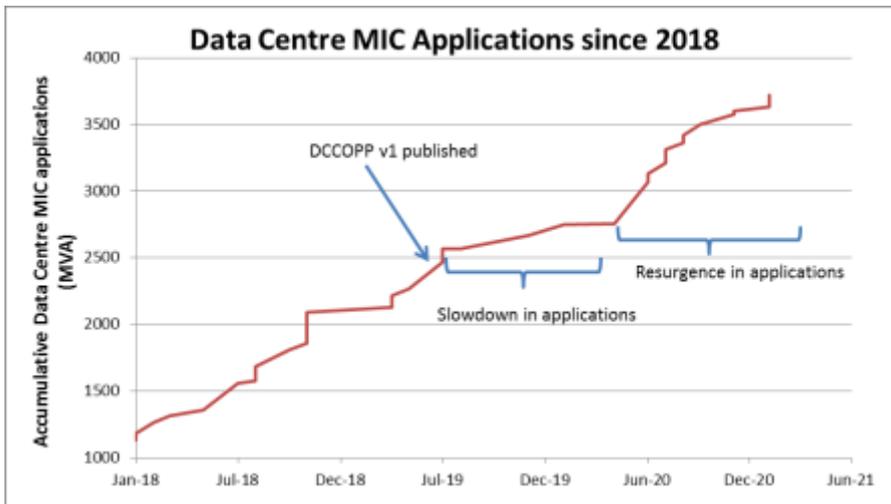
Moreover, with the energy transition we are operating against a changed policy context and we need to be cognisant in terms of the development of the system with a view to the efficient deployment of infrastructure and doing so in a manner which supports Ireland’s decarbonisation ambitions as articulated yourselves as a key objective within the recent Price Review 5 process.

What does this mean in the data centre context and how are the ongoing data centre developments affecting the discharge of these functions? The rate at which data centres are seeking to grow their load is unprecedented. Over the last 4 years we have seen annual increases in demand usage of around 600 GWh from data centres alone – equivalent to the addition of 140,000 households to the power system each year.

While we cannot exactly determine future levels of electricity usage, a range of estimates are used in our demand forecasting models and are presented annually in the Generation Capacity Statement we prepare in accordance with Section 38 of the Electricity Regulation Act, 1999. Our latest range of forecasts are shown in a graph below; this shows a significant increase in demand growth over the next 10 years. For reference we have included a forecast which excludes data centre growth. The median demand forecast predicts data centres accounting for 25% of all demand by 2030. This increases to 33% in the high demand forecast. This represents a current forecast position; it does not include all of the most recently received data centre applications seeking connection, discussed below. This is a constantly evolving landscape.



Connection Agreements are already in place for over 1,800 MW of Maximum Import Capacity (“MIC”) for data centres, with up to 2,000 MW of additional requests received. Approximately 1,000 MW of these requests have been received within the last year as shown in the graph below. To put this in context Ireland has a current demand peak of around 5,500 MW. Many of these data centres have, or are seeking, extremely large loads at one specific site. A data centre with a load of 60 MW would be comparable to the load usage of a large town/small city such as Kilkenny.



It is clear therefore that data centres are having an impact on the Irish electricity system, and on the meeting of the ‘reasonable demands’ by the system that is not comparable to any other industry, or indeed all other industries combined. In the absence of data centres, Ireland would be experiencing much more modest electricity demand growth, consistent with population growth, general economic development and the general development of industrial demand.

Ireland is not alone in facing these challenges. Other countries have had to employ specific and differentiated measures to address the impact of data centre demand growth. For example, Amsterdam¹² halted the issuance of building permits for data centres in certain parts of the city due to concerns relating to grid capability, and Singapore¹³ imposed a moratorium on the building of new data centres in 2019.

EirGrid has proactively engaged with customers and the wider industry to meet the future challenges associated with data centre demand. We recognise the important role that data centres will play in the future energy system and the role that EirGrid has to play in supporting Government Policy in this regard. The Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy¹⁴ confirms the strategic significance of data centres for Ireland. This is further underpinned in the Government's Climate Action Plan in 2019¹⁵. These policies also however recognise the particular challenge that large-scale deployment of data centres brings.

The unprecedented growth brought about by the data centre phenomenon, or paradigm shift, has to raise questions about the very design and purpose of the transmission network and centralised power system itself. Ireland's electricity system was surely not planned to be, nor designed to be planned to be, a system which seeks to serve the needs of the global citizen for increased data supported by an ever proportionately smaller non-data centre commercial, industrial and domestic load. Whilst not questions first and foremost for EirGrid it surely must as part of this, give rise to consideration and potentially wider national debate as to that which is in the public interest in this regard. Such considerations of the public interest are specifically called out in the relevant sections of the statute concerning the granting by EirGrid of connections to the system.

The DCCOPP paper set out the connection offer process and policy for data centres and consolidated existing and new policy measures into a single document for customer clarity. It provided, amongst other things, the option for new capacity for data centres in constrained regions to contract on a 'flexible' basis in advance of the necessary generation and/or transmission infrastructure being in place. This was effectively an enhanced version of potential demand control to help manage periods of security of supply concern. Dublin is specifically called out as a constrained region where flexible demand applies. The actions taken under DCCOPP have served to moderate the level of new capacity being sought by data centres, as captured in the graph above; however the growth in new applications seen in the last year means that we now have to seriously consider next steps. Moreover, the more

¹² <https://www.bloomberg.com/news/articles/2019-07-16/too-much-information-amsterdam-hits-pause-on-data-center-boom>

¹³ <https://www.channelnewsasia.com/news/business/new-data-centres-singapore-temporary-pause-climate-change-14719154>

¹⁴ <https://dbei.gov.ie/en/Publications/Publication-files/Government-Statement-Data-Centres-Enterprise-Strategy.pdf>

¹⁵ https://www.dccae.gov.ie/en-ie/climate-action/publications/Documents/16/Climate_Action_Plan_2019.pdf

recent events affecting overall security of supply now mean that demand growth due to data centres is not just a Dublin concern, but one which impacts the security for supply for Ireland as a whole.

As I alluded to at the outset, the growth in data centres creates additional challenges in meeting the electricity sector's decarbonisation targets. This is not just due to the demand itself but also the concentration of demand in and around Dublin. This creates a greater need to transport renewable energy, such as wind, from across the country where it is largely currently produced to these demand load centres with the potential to drive significant additional investment in transmission infrastructure as a result. This infrastructure is paid for by all customers through tariffs on an inter-generational basis over 50 years. Investments made today will still be being paid for in 2070 and beyond.

It is clear from the above that Ireland is at a significant crossroads for the future development of the power system. The unprecedented scale of proposed data centres pose a number of fundamental questions for Ireland relating to security of supply, new infrastructure development and renewable energy policy. EirGrid has worked with the data centre industry and the CRU to accommodate unprecedented growth to date, and through development of a range of innovative new measures, Ireland has become one of the world leaders for data centre locations. However we have now reached a point that requires new measures that provide clarity to EirGrid and the data centre industry on next steps. I would urge the CRU to carefully consider the issues as set out, which support and reflect the many discussions we have had on this issue to date, with a view to determine such measures as it believes appropriate in this context going forward.

Yours Sincerely

Sent by email and accordingly bears no signature

Bill Thompson

Group Head of Regulation

Cc. Stuart Coleman, Manager, Electricity Networks, CRU
Siobhán O'Shea, Head of Customers and Connections, EirGrid plc.
Shane Maher, Group Regulation, EirGrid plc.