



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

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**Commission for Regulation of Utilities**

# CRU Direction to the System Operators related to Data Centre grid connection processing

**Decision**

Decision Paper

**Reference:** CRU/21/124

**Date Published:** 23 November 2021

## **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

There is an evolving, significant risk to electricity security of supply in Ireland. A significant contributory factor to this risk is a large increase in electricity demand presented by the growth of the data centre industry, as described in the consultation paper *CRU proposed Direction to the System Operators related to Data Centre grid connection*<sup>1</sup> (CRU/21/060) published in June 2021. To manage this risk, the CRU has decided to issue Directions to the Transmission System Operator (TSO), EirGrid and the Distribution System Operator (DSO), ESB Networks, together the System Operators (SOs), regarding the assessment of data centre connection applications.

## Background

In June 2021 the CRU published CRU/21/060 for consultation. This paper outlined measures available to the CRU to balance the needs of the electricity system against the demand for new data centre connections.

The CRU is concerned that continuing to allow data centres to connect to the electricity network in accordance with current arrangements will significantly impact the CRU's ability to comply with its statutory obligation to protect the security of supply of electricity by ensuring that the electricity system can meet the reasonable demands of all consumers, including the demands of existing data centres.

When the system cannot meet the demand required, the SOs are required to take measures to protect security of supply, which can include load shedding<sup>2</sup>, whereby customers could be without power for periods of time. Load shedding is a measure that is employed by the TSO as a last resort to prevent uncontrolled system wide outages, this is an outcome the CRU and the SOs must try to avoid by employing all measures available to them. Consequently, the CRU considers that it is necessary and proportionate to issue Directions to the SOs that will promote and maintain the continuity, security and quality of supply of electricity in the context of these issues and at the same time, where possible, to facilitate the continued

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<sup>1</sup> CRU proposed Direction to the System Operators related to Data Centre grid connection <https://www.cru.ie/wp-content/uploads/2021/06/CRU21060-CRU-consultation-on-Data-Centre-measures.pdf>, Source; CRU

<sup>2</sup> Load shedding occurs when the demand for electricity approaches supply and we are forced to reduce power demand by removing some customers to prevent longer, larger outages

connection of those data centres that can provide supplemental support for their own demand and in turn help to support the stability of the electricity grid.

## Context

To operate the electricity system safely without interruption, the system requires a balance to be struck between available electricity generation and electricity demand to keep it in constant equilibrium. As new demand load is added to the electricity system, an equivalent level of generation capacity must be available to meet the electricity needs of the additional demand load. Currently, the electricity system is experiencing a generation delivery shortfall resulting in an imminent threat to security of supply. The threat to security of supply is significantly compounded by the predicted rapid electricity demand forecasted for the coming years within the most recent *All-Island Generation Capacity Statement (GCS) 2021-2030*<sup>3</sup>, as published by EirGrid. The CRU has sought to address this generation delivery shortfall, within the boundaries of its statutory remit. The CRU published an Information Note *Security of Electricity Supply – Programme of Actions*<sup>4</sup> in September 2021, setting out measures, additional to this decision, that are being put in place to help mitigate the risk to Security of Supply. The CRU will continue to work with SOs, the government and wider industry to facilitate the delivery of an electricity generation fleet that can meet Ireland's *Climate Action Plan 2021*<sup>5</sup> (CAP) target of up to 80% of electricity demand from renewable energy sources by 2030, whilst ensuring Ireland's energy needs are met. These targets align with the *National Development Plan 2021 – 2030*<sup>6</sup> which commits to increasing the share of renewable electricity up to 80% by 2030. The CRU considers that measures employed to mitigate the risk to security of supply must not focus solely on the generation side of the system. With that balance in mind, the CRU considers it necessary to adopt and encourage responsive measures relating to both the generation and demand sides of the electricity market.

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<sup>3</sup> All-Island Generation Capacity Statement; <https://www.eirgridgroup.com/site-files/library/EirGrid/208281-All-Island-Generation-Capacity-Statement-LR13A.pdf> , Source; EirGrid

<sup>4</sup> Security of Electricity Supply – Programme of Actions; <https://www.cru.ie/wp-content/uploads/2021/09/CRU21115-Security-of-Electricity-Supply-%E2%80%93-Programme-of-Actions.pdf> , Source; CRU

<sup>5</sup> Climate Action Plan 2021; <https://www.gov.ie/en/publication/6223e-climate-action-plan-2021/> , Source; [www.gov.ie](http://www.gov.ie)

<sup>6</sup> National Development Plan 2021 – 2030; <https://www.gov.ie/en/publication/774e2-national-development-plan-2021-2030/> , Source; [www.gov.ie](http://www.gov.ie)

The TSO considers data centres to be a distinct class of demand side energy user due to their energy usage characteristics and strong influence on the electricity system. Like other large energy users (LEUs), they have a relatively large energy consumption, however most LEUs ramp up their operations and energy use slowly over time. Data centres as a class, tend to ramp up to their full Maximum Import Capacity (MIC) far quicker than other LEUs. The large number of data centre applications to date combined with the scale of MIC applied for by this class of user (see section 2.2 Data Centre Demand) is a major challenge for the electricity grid in facilitating the additional electricity demand with equivalent generation and electricity infrastructure in a relatively short space of time. Consequently, data centres have been identified as disproportionately contributing to the predicted rapid demand growth in the most recent GCS. The scale and speed of electricity demand growth in the data centre sector is significantly beyond that arising from organic growth in the general economy or even that arising from government initiatives to electrify the heating and transport sectors. This distinct challenge posed by the large number of data centres already connected or seeking to connect to the electricity system and their collective influence on the electricity system supports the consideration of data centres as a distinct class of demand side user. This challenge was identified in the letter to the CRU dated 27 May 2021 (See Appendix 3), whereby 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.

Data centre electricity demand growth necessitates a specific response from the CRU, consistent with its legal framework (set out further below), and applied in a proportionate and objectively justifiable manner, to mitigate these security of supply challenges as Ireland seeks to meet growing demand and to continue Ireland's pathway to decarbonisation.

### **Overview of Directions**

In the context of a significant risk to security of supply, the CRU has decided to issue Directions to the SOs setting out criteria that the SOs will be required to consider in assessing data centre connection applications to determine whether to make a connection offer. In making this decision, the CRU is acting in accordance with its duty to protect security of supply while ensuring that reasonable demand for electricity is met through the introduction of assessment criteria which provide *inter alia* that, where data centre applications can offer practical measures to address their impact on the security of supply risk, this will be taken into account in considering whether a connection offer can be made.

The assessment criteria will apply to all connection applications received for the connection of data centres at any location in Ireland, including those applications currently being processed, and will have immediate effect.

### **Assessment Criteria**

Pursuant to Section 34(1) of the Electricity Regulation Act 1999 (the Act), the CRU directs EirGrid as (TSO) & ESBN as (DSO) to assess applications for the connection of data centres by reference to the following assessment criteria to determine whether a connection offer can be made within the system stability and reliability needs of the electricity network:

- The location of the data centre applicant with respect to whether they are within a constrained or unconstrained region of the electricity system.
- The ability of the data centre applicant to bring onsite dispatchable generation (and/or storage) equivalent to or greater than their demand, which meets appropriate availability and other technical requirements as may be specified by the relevant SO, in order to support security of supply.
- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO 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 the relevant SO, in order to support security of supply.
- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO, in times of system constraint, in order to support security of supply.

In CRU/21/060, in which the assessment criteria were referred to as “*prioritisation criteria*”, it was proposed that the criteria outlined therein would be used by the SOs to prioritise applications to be processed. The Directions will now provide for the following: Where, having considered and applied the assessment criteria in the Direction to an application and, an SO is of the view that a connection offer cannot be made to an applicant consistent with the needs of the electricity system, the application will not be processed further by the SO and, accordingly, the application will terminate.

In CRU/21/060 it was stated that the criteria were not ranked in order, but that, following the consultation period, a decision may be taken to rank the criteria. The CRU has decided not to rank or afford priority to certain criteria over others. The CRU considers that the SOs are best placed to understand the dynamics of their respective systems and should be afforded

flexibility in considering the assessment criteria to decide whether it is appropriate to make a connection offer. Each application will be different and should be considered on its own merits by the relevant SO.

The CRU will review this Decision and the ongoing need for further Directions as and when it considers it necessary to do so. The CRU will monitor the effectiveness of these assessment criteria in mitigating the risk to security of supply by way of bi-annual<sup>7</sup> reports which the SOs will be required to provide to the CRU.

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<sup>7</sup> First report due by 1 March 2022

## Public/Customer Impact Statement

### What is Security of Electricity Supply?

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

### What is a Data Centre?

A **data centre** is a facility that centralises an organisation's shared information technology (IT) operations and equipment for the purposes of storing, processing, and distributing data and applications.

### Why is this decision necessary?

The CRU recognises the benefits data centres may bring to the Irish economy. However, as large consumers of electricity, data centres pose a particular challenge to the delivery and maintenance of a sustainable and secure power system. It is the CRU's intention to continue to work with the SOs and the data centre community to explore 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 users, including the appropriateness of costs charged to end users. Without mitigation of the risk to security of supply, 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.

In recent years, EirGrid has consulted on and implemented the Data Centre Connection Offer Process and Policy (DCCOPP) in response to the number and scale of large data centres seeking to connect to the electricity system. These policy papers were issued in June 2019<sup>8</sup> and July 2020<sup>9</sup> and set out measures that were necessary to maximise the opportunities for data centre customers applying to connect to the grid against a backdrop of

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<sup>8</sup> 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> , Source; EirGrid

<sup>9</sup> 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](https://www.eirgridgroup.com/site-files/library/EirGrid/Data-Centre-Connection-Offer-Process-and-Policy_v2_July-2020.pdf) , Source; EirGrid

challenges that faced the electricity system. Additionally, EirGrid provided an Information Note on flexible demand for data centre customers to relevant customers, and a *Flexible Demand Protocol*<sup>10</sup> was published on EirGrid's website in March 2021.

In its letter to the CRU dated 27 May 2021 (See Appendix 3), 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 seeking, through this Decision and the resulting Directions to the SOs, to protect both electricity consumers and security of supply while continuing to allow data centres to connect to the electricity system.

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<sup>10</sup> Flexible Demand Operating Protocol; <https://www.eirgridgroup.com/site-files/library/EirGrid/Flexible-Demand-Operating-Protocol.pdf> , Source; EirGrid

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## Glossary of Terms and Abbreviations

Abbreviation or Term	Definition or Meaning
<b>CRU</b>	Commission for Regulation of Utilities
<b>CAP</b>	Climate Action Plan 2021
<b>DBEI (now DETE, Department of Enterprise, Trade and Employment)</b>	The Department of Business, Enterprise and Innovation
<b>DCCOPP</b>	Data Centre Connection Offer Policy and Process
<b>DSO</b>	Distribution System Operator (ESB Networks DAC)
<b>GCS</b>	EirGrid's All-Island Generation Capacity Statement 2021 - 2030
<b>GWhrs</b>	GigaWatt-hours
<b>LEUs</b>	Large Energy Users
<b>MW</b>	MegaWatts
<b>MVA</b>	MegaVolt-Amperes
<b>NG</b>	Natural Gas
<b>SFO</b>	Secondary Fuel Obligation
<b>SOs</b>	System Operators (being the Transmission System Operator, EirGrid plc and the Distribution System Operator, ESB Networks DACTSO and the DSO)
<b>SONI</b>	Electricity System Operator for Northern Ireland
<b>TSO</b>	Transmission System Operator (EirGrid plc)

# 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 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](http://www.cru.ie).

## 1.2 Background

According to the Department of Business, Enterprise and Innovation's<sup>11</sup> (DBEI) *Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy*, published in June 2018, the development of data centres in Ireland is a key aspect in promoting Ireland as a digital economy hot-spot in Europe<sup>12</sup>.

Data Centres as a particular class of customer were identified by DBEI in the aforementioned Government Statement on The Role of Data Centres in Ireland's Enterprise Strategy stating *"...as large consumers of electricity, data centres also pose particular challenges to the future planning and operation of a sustainable power system. The Government recognises these challenges and will take steps to mitigate them. A plan-led approach will develop a range of measures to promote regional options for data centre investment, minimising the need for additional grid infrastructure. A balance will be maintained between the distributional impacts of higher energy costs on the economy and the longer-term economic impacts of utility intensive enterprise investment."*

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.

EirGrid identified the challenges the data centre industry posed to the electricity grid and in 2018 they held a number of forums with the data centre industry to discuss these challenges and possible solutions. EirGrid also highlighted these challenges to the CRU in 2018 describing the increase in data centre connections as a paradigm shift, a transformational change from the conventional way electricity has been used in Ireland in recent decades. During this time, EirGrid engaged with the CRU regarding the introduction of measures to address the challenges the electricity network faced due to the rapid increase in data centre connection applications and published the Data Centre Connection Offer Policy and Process (DCCOPP) Version 1 on 12 June 2019. A revised version of the DCCOPP (Version 2) was

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<sup>11</sup> The Department of Business, Enterprise and Innovation (DBEI) is now the Department of Enterprise, Trade and Employment (DETE)

<sup>12</sup> 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>; Source; Gov.ie

published on 17 July 2020 following consultation with industry stakeholders. EirGrid have indicated to the CRU that the measures introduced by the DCCOPP are insufficient in addressing the challenges that data centres pose to security of supply given other developments, such as the generation shortfall realised in recent Capacity Market auctions.

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 have been highlighted. EirGrid's latest GCS states "*The long-term demand forecast in Ireland continues to be heavily influenced by the expected growth of LEUs, primarily data centres. EirGrid's analysis shows that demand from data centres could account for 23% of all demand in Ireland by 2030 in our Median demand scenario*". The CRU considers that intervention is necessary to maintain the security of the electricity system for all customers. The rationale for this consideration is explained further below.

The CRU published the consultation paper CRU/21/060 in June 2021, setting out a range of mitigation options available to the CRU in addressing the imminent threat to security of supply posed by the disproportionate rapid increase in data centre connection applications. The CRU received a large volume of responses to the consultation. A summary of these responses is provided in Section 4 "Summary of Responses to CRU/21/060", together with the CRU's response to the consultation submissions in Section 4.4 of this decision paper, "CRU Response".

### **1.3 Purpose of Paper**

The purpose of this paper is to communicate the CRU's consideration of responses to CRU/21/060, to communicate the details of the CRU's decision and to inform industry stakeholders of the CRU's decision to direct the SOs to implement a set of assessment criteria by which the SOs will assess data centres applications. The assessment criteria will have immediate effect, upon issuance of the Directions to the SOs.

## 2. Policy

### 2.1 Policy Context

The CRU has an overarching statutory function, under the Act and the European Communities (Internal Market in Electricity) Regulations 2005 (SI No 60 of 2005), to ensure security of supply for all consumers. While the CRU recognises that the principle of non-discrimination in the provision of access to the electricity network is provided for in the Act and in European legislation, this principle is not absolute and must be balanced against the CRU and the SOs' other statutory obligations, such as the protection of security of supply of electricity. This decision and the associated Directions to the SOs apply to the processing of data centre grid connection applications only. The CRU considers the introduction of these focused measures to be a proportionate, reasonable and objectively justifiable in mitigating an imminent threat to security of supply and this is detailed further below.

The CRU is concerned that continuing to allow data centres to connect to the electricity network in accordance with current arrangements will significantly impact the ability of the electricity system to meet the reasonable demands of all consumers, including those data centres already connected to the network. Data centres, as a class of energy user, have the ability to connect to the electricity grid and ramp up their operations far more quickly than other LEUs. Considering the number of data centre applications to date combined with the scale of MIC applied for by this class of user (demonstrated in section 2.2 Data Centre Demand) and the electricity network's inability to facilitate this demand in the near future, it is clear that the collective demand of this class of energy user may no longer be considered reasonable in the context of connection to the electricity grid.

The CRU notes that EirGrid has outlined the expected electricity demand and generation for the coming ten years within EirGrid's GCS. EirGrid has identified generation deficits for the coming years if the current level of electricity demand growth continues. This medium-term risk is exacerbated by recent generation shortfalls in the delivery of successful Capacity Market 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 CAP 2021 sets a target of achieving up to

80% 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 in line with achieving CAP targets.

According to the 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 if data centre connections continue on their current trajectory without intervention. It is evident to the CRU that additional intervention is necessary now to ensure that security of supply is maintained.

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 being the ultimate counterparty.

As set out in Section 2.2 below, it is evident that due to the rapid, disproportionate impact of the increase in data centre connections, as compared to other large energy user industries, the security of supply and financial risks to the energy consumer are increased.

The CRU understands that data centres have demonstrated, in other jurisdictions, their ability and willingness to adapt their energy usage when there is a need for flexible demand measures on the system, on an enduring basis. By way of example, data centres in other jurisdictions have been able to change some of their processes so that their electricity demand is weighted towards minimising usage during the day to avoid peak demand.

While the CRU has decided to issue Directions to the SOs which focuses on data centres alone, it is doing so while also promoting and maintaining the continuity, security and quality of the supply of electricity and facilitating the continued connection of data centres to the greatest practical extent.

The CRU considers that it must take measures to address the unique challenge presented by data centres, projected by EirGrid to be the single largest homogenous driver of demand in Ireland for the foreseeable future in circumstances where, if nothing is done, and the system cannot meet demand, the SOs would be required to take measures which can

include load shedding whereby customers could be without power for periods of time. This outcome is not acceptable to the CRU. Consequently, the CRU considers that it is necessary and proportionate to issue a Direction to the SOs that promotes and maintains the continuity, security and quality of the supply of electricity in the context of these issues whilst facilitating the continued connection of data centres to the greatest practical extent.

## 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 has 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 in the graph below (Figure 1); this shows a significant increase in demand growth over the next 10 years. Figure 1 also includes a forecast which excludes data centre growth.

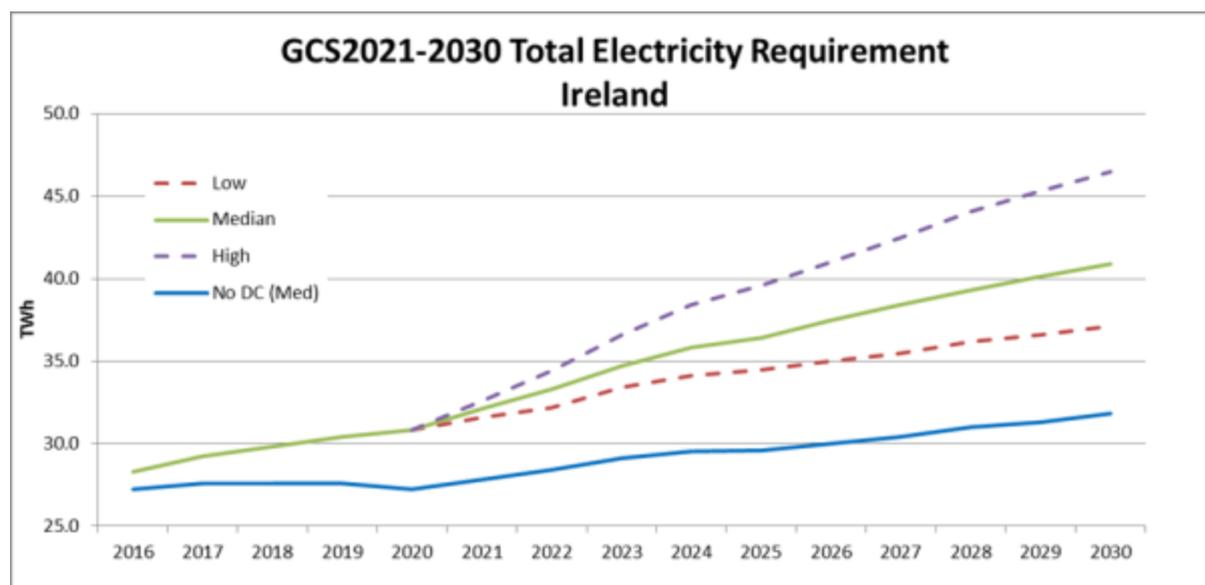


Figure 1: Data centre demand forecasts against average growth forecasts. Source: EirGrid

The median demand forecast predicts data centres accounting for 23% of all demand by 2030. This increases to 30% in the high demand forecast.

EirGrid has outlined that Connection Agreements are already in place for over 1,800 MVA of MIC for data centres, with up to 2,000 MVA of additional requests received. Ireland has a current demand peak of around 5,500 MVA. A breakdown of the grid connection status of data centres in Ireland on both the transmission and distributions systems is provided in the tables below;

<b>Transmission System</b>			
<b>Greater Dublin Region</b>		<b>Outside Dublin Region</b>	
<b>Connected</b>	427.5 MVA	<b>Connected</b>	0 MVA
<b>Contracted</b>	839.4 MVA	<b>Contracted</b>	57 MVA
<b>Live Offer</b>	0 MVA	<b>Live Offer</b>	0 MVA
<b>Application Stage</b>	1199.21 MVA	<b>Application Stage</b>	788.2 MVA
<b>On Hold</b>	55.5 MVA	<b>On Hold</b>	225 MVA

Table 1: Transmission System Data Centre Grid Connection Status as of November 2021 Source EirGrid

<b>Distribution System</b>			
<b>Greater Dublin Region</b>		<b>Outside Dublin Region</b>	
<b>Connected</b>	496.8 MVA	<b>Connected</b>	7 MVA
<b>Contracted</b>	120.65 MVA	<b>Contracted</b>	0 MVA
<b>Live Offer</b>	0 MVA	<b>Live Offer</b>	5.23 MVA
<b>Application Stage</b>	86.1 MVA	<b>Application Stage</b>	40 MVA
<b>On Hold</b>	72.3 MVA	<b>On Hold</b>	10 MVA

Table 2: Distribution System Data Centre Grid Connection Status as of November 2021 Source; ESBN

\*The information provided in the above tables is accurate as of November 2021.

It is evident from the above tables that there is a disproportionate interest among data centre developers to apply for connection to the greater Dublin Region. The greater Dublin Region has been identified as a constrained region by EirGrid, as described in the *DCCOPP Version 1*. Connecting more data centres to the greater Dublin Region may exacerbate the constraint

issues that have developed in this area. Given the constraint situation in the greater Dublin Region, and the number of data centres applying for connection to the greater Dublin Region, the CRU considers it necessary to introduce a locational criterion in the Directions to the SOs which requires the SOs to take into consideration the effects of connecting data centres inside constrained areas before further processing data centre applications, in order to mitigate further constraint issues in this area and any other area that may be identified by the SOs as constrained in future.

Over 1,000 MVA of data centre applications have been received by EirGrid within the last year as shown in the graph below.

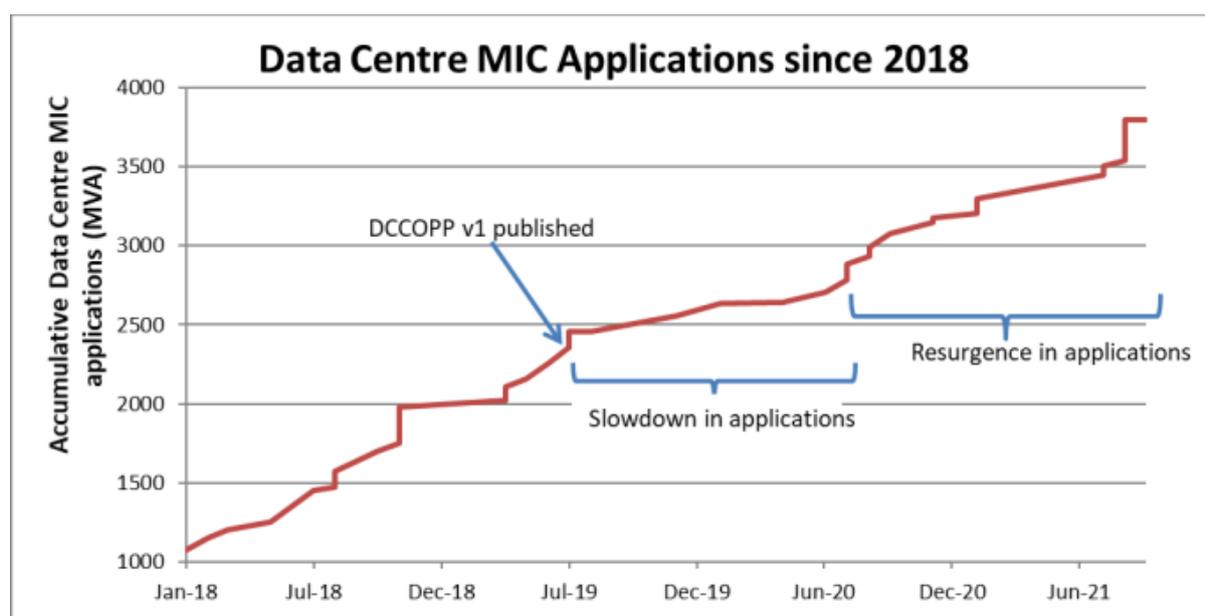


Figure 2: Data centre applications and corresponding load demand since 2018. Source: EirGrid.

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. Adding approximately 1000 MVA of demand load would be equivalent to adding over 16 cities with an energy consumption similar to Kilkenny to the electricity grid in a relatively short timeframe. This is a level of demand that the electricity system cannot currently accommodate. The generation capacity shortfalls that the electricity system is experiencing currently, is signalling the scale of the challenge to meet current and predicted future energy demands, even without the development of future data centres.

Much of the 1000 MVA of data centre applications is for sites within the greater Dublin Region. The greater Dublin Region has been identified as constrained by the TSO in the *DCCOPP Version 1* and also in EirGrid and SONI's *All-Island-Ten-Year-Transmission-Forecast-Statement-2019*<sup>13</sup> (TYTFS) and connecting demand users with the energy usage profile of data centres in areas that are already constrained will result in the system becoming overwhelmed. This problem is exacerbated by the ongoing challenges faced by the SOs in developing further electricity infrastructure in constrained regions such as the greater Dublin Region.

It is clear therefore that data centres are having an impact on the Irish electricity system, and on the meeting of 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 regions have had to employ specific and differentiated measures to address the impact of data centre demand growth. For example, the CRU is aware that Amsterdam halted the issuance of building permits for data centres in certain parts of the city due to concerns relating to grid capability in 2019<sup>14</sup>. Similarly, the CRU is aware that the city of Frankfurt is also considering regulatory controls on the development of data centres<sup>15</sup> amid concerns relating to the growth in power usage from new data centre developments and other factors.

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<sup>13</sup> All-Island-Ten-Year-Transmission-Forecast-Statement-2019; <https://www.soni.ltd.uk/media/documents/All-Island-Ten-Year-Transmission-Forecast-Statement-2019.pdf>, Source; EirGrid

<sup>14</sup> Press release from the Municipality of Amsterdam, along with the adjoining urban Municipality of Haarlemmermeer; More control over the location of data centers in Amsterdam and Haarlemmermeer; <https://www.amsterdam.nl/nieuwsarchief/persberichten/2019/persberichten-marieke-doorninck/regie-vestiging-datacenters-amsterdam/>, Source; www.amsterdam.nl

<sup>15</sup> Parlements Informations System (PARLIS); Report of the magistrate from 21.09.2020; [https://www.stvv.frankfurt.de/PARLISLINK/DDW?W=DOK\\_NAME=%27B\\_474\\_2020%27](https://www.stvv.frankfurt.de/PARLISLINK/DDW?W=DOK_NAME=%27B_474_2020%27), Source; www.stvv.frankfurt.de

## 2.3 Legal Context

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

- Regulation 28 the European Communities (Internal Market in Electricity) Regulations 2005 (SI No 60 of 2005) sets out the CRU's duty in respect of the security of supply of electricity. Regulation 28(5) provides that the CRU shall take such measures as it considers necessary to protect security of supply.
- Section 34 of the Act provides that the CRU has the power to issue Directions to the SOs in relation to the connection to and use of the distribution and transmission systems, including directions for the range of purposes set out in Section 34 (2), and the SOs shall comply with such Directions. Under Section 34(2), Directions given by CRU may provide for, inter alia, those 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 34(4)(a) of the Act provides that the SOs are not required to enter an agreement with a person for connection to or use of the transmission or distribution system where they have demonstrated to the satisfaction of the Commission that it is not in the public interest to provide additional capacity to meet the requirements to be imposed by that agreement.
- Sections 9(4) and 9(5) of the Act 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 Decision are contained at section 9(4)(a)(i), to secure that all reasonable demands by final customers of electricity for electricity are satisfied, section 9(4)(a)(v), to promote the continuity, security and quality of supplies of electricity, and section 9(4)(a)(vi), to promote the use of renewable, sustainable or alternative forms of energy.
- Section 9 (3) of the Act provides that it is the duty of 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.
- The responsibilities and functions of the SOs, arising under SI No 445 of 2000, including the duty to operate and ensure the maintenance of and, if necessary, develop a safe, secure, reliable, economical and efficient electricity systems with a view to ensuring that all reasonable demands for electricity are met.
- Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive

2012/27/EU, and in particular, its recitals which provide guidance on the operation of the internal market in electricity.

- The principle of equal treatment arising under European law, which provides that individuals or undertakings in comparable situations must not be treated differently or that individuals or undertakings in non-comparable situations must not be treated in the same way, save where such differential or similar treatment (as the case may be) can be objectively justified (i.e. that the measure taken is in pursuit of a legitimate aim and that it is proportionate)
- The principle of proportionately arising under European law, which provides that any measure must be suitable for the purpose of attaining the desired objective and go no further than is necessary for achieving that purpose.

### 3. Mitigation options considered

Demand in the Irish electricity system is increasing and managing the transition to a more flexible system in the circumstances outlined in this decision paper requires the adoption of mitigation measures by the CRU to maintain security of supply while connecting new load to the system, where possible, in the most efficient manner.

EirGrid has 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 outcome is not acceptable to the CRU, and it continues to work with stakeholders to implement the solutions needed to manage the supply demand balance. More specifically, the CRU has worked with EirGrid to identify appropriate short, medium and long term measures to ensure available supply can meet all reasonable demands. As a consequence of this process, the CRU published an Information Note *Security of Electricity Supply – Programme of Actions* in September 2021, setting out measures that are being put in place to help mitigate the risk to security of supply.

As part of this process, the CRU considers that it must take steps to address the unique challenge presented by data centres, projected by EirGrid to be the single largest homogenous driver of demand in Ireland for the foreseeable future. Those steps must incentivise adaptability and pragmatism on the part of the SOs and data centre operators, while continuing to facilitate the connection of data centres to the electricity network, where possible, without destabilising that network to the detriment of all electricity customers.

In CRU/21/060 the CRU outlined three mitigation options that it had considered with a view to managing the data centre connection demand challenge and set out its preliminary views in respect of each of these options. These options are considered again below. A summary of the consultation responses received in respect of each of these three options is set out in section 4 below, together with the CRU's response to those submissions.

### **3.1 Do Nothing**

The CRU considered taking no action, in which case the current policy framework would persist without any further Direction from the CRU. The CRU outlined its preliminary view that this would likely result in a situation where demand would outstrip available supply at the peak which would result in load shedding and consumers facing rolling blackouts. The CRU outlined that this would not be an acceptable situation.

### **3.2 Moratorium on Data Centre Connections**

The CRU considered issuing Directions to the SOs to cease processing all data centre connection applications (including modifications) and new connection applications for a certain number of years, until this demand can be safely and securely facilitated by the network.

### **3.3 Connection Measures**

In CRU/21/060 the CRU proposed to direct EirGrid and ESBN as the SOs 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 EirGrid 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 EirGrid in times of system constraint, in order to support security of supply;
- (b) EirGrid & ESN shall apply the above prioritisation for data centre connection applications on an Ireland wide basis.

## **4. Summary of responses to CRU/21/060**

The following provides a summary of stakeholders' responses to the proposed options in CRU/21/060. In total, 52 responses were received.

Non-confidential responses are published on the CRU's consultation website, and a list of parties who submitted them is provided in Annex 1 "List of Non-Confidential Respondents". The CRU received several responses provided on a confidential basis which it does not propose to publish. Each response was carefully considered by the CRU in making its decision.

### **4.1 Do Nothing**

The following is a summary of the main points made by respondents in respect of the "Do Nothing" option:

- No support for the "Do nothing" option was evidenced from the responses.
- The majority of respondents were of the view that this option should not be considered further and that the risks associated with this option are not acceptable.
- The rest of the respondents did not make submissions specific to this option.

### **4.2 Moratorium on Data Centre Connections**

The following is a summary of the main points made by respondents in respect of the "Moratorium on Data Centre Connections" option:

- There was minimal support for the "Moratorium on Data Centre Connections" option from respondents.
- The majority of respondents were of the view that this option is not necessary at this time and should not be considered further.
- The respondents that did support the moratorium approach were of the view that this option had not been fully investigated within CRU/21/060 and the benefits of a moratorium or partial moratorium on data centres have not been sufficiently discussed.
- A minority of respondents did not make submissions specific to this option.

## 4.3 Connection Measures

The following is a summary of the main points made by respondents in respect of the “Connection Measures” option:

- The majority of respondents expressed support for the “Connection Measures” option.
- A minority of respondents did not make submissions specific to this option.

### Dispatchable Generation and Secondary Fuel Obligations

- Many respondents were concerned with introduction of prioritisation criteria that require data centres to install onsite dispatchable generation which is most likely to be in the form of fossil fuel generation as this could compromise Ireland’s recently updated CAP 2021 target of achieving up to 80% renewable energy electricity generation by 2030. This was also identified as being contrary to many data centre operator’s climate action policies. Many data centre operators have implemented policies to only procure renewable energy to power their data centres. Industry stakeholders also expressed concern in relation to the uncertainties that surround the installation and use of on-site generation, most notably whether the onsite generation will be expected to interact with the Capacity Market or remain isolated from that market and whether *Secondary Fuel Obligations (SFO)*<sup>16</sup> apply to operators who install onsite generation greater than 10MW. Some respondents were of the view that if onsite generation is installed that the installations should be futureproofed to ensure that they have the ability to run on non-fossil fuel sources such as hydrogen and biomethane or blends of fossil and non-fossil fuels (e.g. natural gas (NG) and hydrogen blend).
- Some respondents were of the view that the application of the SFO policy may mean that data centre operators would be required to store large volumes of secondary fuel onsite to meet the requirements of the obligation. Depending on the volume of fuel required to be stored on site, the data centre site may become a Seveso site<sup>17</sup> which

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<sup>16</sup> Secondary Fuel Obligations on Licensed Generation Capacity in the Republic of Ireland (CER/09/001); <https://www.cru.ie/wp-content/uploads/2009/07/cer09001.pdf> ;Source; CRU

<sup>17</sup> Seveso Site; <https://www.cru.ie/wp-content/uploads/2009/07/cer09001.pdf> ; Source; Dublin City Council

requires compliance with the *Seveso Directive* and *Control Of Major Accident Hazards (COMAH) regulations*<sup>18</sup>.

### Capacity Market

- A number of respondents were critical of the Capacity Market and the Capacity Remuneration Mechanism, expressing the view that policy in this area has been unsuccessful in procuring sufficient generation to meet forecasted demand. Many have expressed the view that the Capacity Market should be reviewed and redesigned to ensure it is effective in meeting Ireland's demand needs with the procurement of sufficient supply.

### Ranking of the Criteria

- A number of respondents expressed concerns in relation to the proposed prioritisation criteria set out in Section 3.3 of CRU/21/060, the ranking of these criteria and highlighted other policies in place that may have an impact on the implementation of the proposed prioritisation criteria which are discussed further below.

### Locational Criterion

- Some respondents were critical of the locational criterion of the prioritisation criteria, highlighting the implications of locating outside areas with well-developed internet infrastructure such as Dublin, resulting in undesirable higher internet latency. Other respondents made arguments contrary to this concern, stating that the advent of new internet technologies will mean the locational element will have negligible effects on internet latency.

### Alternative Technologies

- Some respondents expressed the desire to engage with the SOs further to explore other options that may be available such as the implementation of demand side solutions, battery solutions, hybrid solutions and fuel cell solutions. Options such as the use of electrolysis to reduce the curtailment of renewables and maximise their potential were also suggested.

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<sup>18</sup> COMAH regulations; [https://www.hsa.ie/eng/Your\\_Industry/Chemicals/Legislation\\_Enforcement/COMAH/SI\\_209\\_of\\_2015.pdf](https://www.hsa.ie/eng/Your_Industry/Chemicals/Legislation_Enforcement/COMAH/SI_209_of_2015.pdf) Source;\_Health and Safety Authority (HSA)

### Level of Demand Flexibility

- Some respondents highlighted the difficulty they are experiencing in designing solutions to combat the risk to security of supply when the level of flexibility necessary to support the grid is undefined.

### Tariffs and Bonds

- Some respondents suggested revisions to tariff schemes to support efficient transmission network build out and the use of bonds if the risk of stranded assets were a concern.

### Connection Measures being applied to data centres only

- Some respondents were of the view that data centres are being unfairly singled out in the proposed Direction to the SOs and that the connection measures should be applied to all LEUs and not just one class of demand customer.

## 4.4 CRU Response

The CRU appreciates the time and effort given by industry stakeholders in submitting responses to CRU/21/060. The risk to security of supply is an imminent threat to our electricity system and thus requires measures that can be enacted immediately which has been an important factor considered by the CRU in reaching a decision set out in Section 5. While the CRU has considered all of the points raised in the consultation responses, in this decision paper the CRU has focused on what it considers to be the most relevant points necessitating further clarification and these are set out below.

### Mitigation Option – Do nothing

In CRU/21/060 the CRU outlined a number of mitigation options available to it in light of the challenges identified as regards security of supply. As regards the “do nothing” option, the CRU outlined its view that this would likely result in an unacceptable situation where demand outstrips available supply at the peak, resulting in load shedding and consumers facing rolling blackouts. Nothing in the submissions received in response to CRU/21/060 has caused the CRU to change its view of this option. Therefore, no further consideration is given to this option in this decision.

### Mitigation Option – Moratorium on data centre connections

In CRU/21/060 the CRU outlined another option as being to impose a moratorium on data centre connections but set out its preliminary view that this option would not be appropriate at this time give that there are mechanisms that, if employed by data centre applicants, could lead to them being more flexible in terms of demand and their contribution to the mitigation of the security of supply risk. Having considered the submissions received in response to consultation, the CRU remains of the view that it is not currently appropriate to impose a moratorium on data centre connections in light of the functions and obligation of the SOs to ensure all reasonable demands for electricity are met. In addition, a moratorium would be contrary to current government policy on data centres, the aforementioned *Government Statement on the Role of Data Centre in Ireland’s Enterprise Strategy*.

The CRU will however monitor the effectiveness of this Direction in mitigating the risk to security of supply and reserves the right to take additional measures in the future, up to and including a moratorium on data centre connections, if it considers it to be necessary and appropriate to do so to protect security of supply. The appropriateness of a moratorium on

data centre connections is dependent upon the evolving security of supply situation which will depend on how industry responds to the requirements of the electricity grid as Ireland transitions to carbon neutrality. No further consideration is given to this option in this decision.

### Mitigation Option - Connection Measures

The remainder of this section focuses on the CRU's consideration of the responses received relating to "*Connection Measures*" and the arguments raised in those responses are addressed thematically below.

### Dispatchable On-Site Generation and Secondary Fuel Obligations

The CRU notes that the installation of dispatchable onsite generation for data centre applicants, that uses fossil fuel as the primary fuel source will not, on their own, assist in meeting Ireland's recently updated CAP 2021 target of achieving up to 80% of electricity demand from renewable energy sources by 2030. While Ireland's CAP targets are a concern for the CRU in issuing a Direction that involves the employment of fossil fuel generation as a mitigation measure, there are no other viable short-term mitigation options available, other than imposing a moratorium on data centre demand connections, that will continue to facilitate data centre connections while mitigating the threats to security of supply.

The CRU expects that any dispatchable on-site generation that uses fossil fuel sources developed by data centre operators, will use natural gas (NG) as its fuel source. The CRU considers NG to be a transitional fuel in terms of meeting Ireland's Climate Action Plan targets. Considering many data centre operators mandates are to use 100% renewable energy, the CRU expects that fossil fuel powered dispatchable on-site generation that is installed by data centre operators will be futureproofed to the extent that is possible at this time and will have the ability to run, or capable of being retrofitted to run, on alternative renewable fuel sources such as NG/biomethane, NG/hydrogen blends, 100% biomethane and 100% hydrogen.

Within the assessment criteria there is a criterion that states the installation of dispatchable on-site generation should be equivalent or greater than the electrical demand of the data centre. The "greater than" piece is to allow for the de-rating factor that is applied to generators which accounts for reduced output of generators in real-world operating conditions compared to the conditions under which the generators were rated and plant

shutdowns due to maintenance and other technical issues. Installing generation that is greater than a data centre's load can mitigate the effects of de-rating.

The CRU notes that fossil fuel generators with an installed capacity of greater than 10MW are required to provide secondary fuel storage under the SFO. This obligation is to remain in place for data centre applicants that install fossil fuel powered dispatchable onsite generation over 10MW.

### Capacity Market

The CRU notes that data centres require clarity in terms of whether dispatchable on-site generation that they develop as part of the mitigation to the risk to security of supply will have the ability to participate in the Capacity Market. The aim of this decision is to mitigate the risk to security of supply. Requiring dispatchable on-site generation to be installed and solely act as a form of back-up generation for the data centre and not permit the generator to participate in the Capacity Market could be considered to be counter-intuitive in addressing the generation scarcity that the electricity system is currently experiencing. Furthermore, under the *Capacity Market Code*<sup>19</sup> the "De-Minimus Threshold"<sup>20</sup> is a Maximum Export Capacity of 10MW. This means that any dispatchable generator greater than 10MW is required to participate in the Capacity Market. Data centre operators that develop on-site dispatchable generation may, or maybe<sup>21</sup> required, to participate in the Capacity Market, in accordance with the arrangements set out by the TSO. Providing generation to the data centres in times of scarcity or when called upon by the SOs will discharge obligations to the capacity market. It should be noted that developing dispatchable on-site generation greater than 1MW will require data centre operators to acquire an authorisation to construct and a licence to generate as appropriate (under section 14 and section 16 of the Act) from the CRU.

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<sup>19</sup> Capacity Market Rules; <https://www.sem-o.com/rules-and-modifications/capacity-market-modifications/market-rules/>, Source; Single Electricity Market Operator (SEMO)

<sup>20</sup> **De-Minimus Threshold** means the MW capacity threshold under the Trading and Settlement Code beyond which a Generator Unit is required to participate in the Balancing Market. As at the Commencement Date, the De Minimis Threshold is a Maximum Export Capacity of 10MW

<sup>21</sup> This is dependent upon the backup generation installed capacity

## Ranking of Assessment Criteria

The proposed prioritisation criteria, now known as “assessment criteria”, were not ranked in the CRU/21/060 consultation paper. The CRU considers it prudent for the SOs to apply each of the assessment criteria to data centre applications as they see fit to ensure security of supply and combat constraint issues, while facilitating the connection of data centres. The needs of the electricity system will dictate the application of the assessment criteria. The assessment criteria are set out in Section 5.1 “Updated Connection Measures” and remain unranked.

## Locational Criterion

The CRU notes that there were differing opinions regarding the locational criterion within the prioritisation criteria. The CRU considers the location of a data centre (whether it is in a constrained or unconstrained region) to be an important factor in determining whether a connection offer can be made. Areas on the electricity network that have been deemed constrained by the SOs are likely not to have the necessary infrastructure in place to facilitate the flow of more electricity from generation to demand customers. Connecting data centres in areas that may be unable to facilitate the conduction of more electricity may exacerbate the constraint problem and lead to negative effects to the local electricity network in these areas. The development of electricity transmission and distribution infrastructure is a process that requires a lot of time and engagement with stakeholders and is not a short-term solution. To facilitate the continued connection of data centre customers, the CRU considers it necessary to direct the SOs to consider the location of a data centre before processing its application further. The data centre may be better located elsewhere on the electricity grid whilst infrastructure is upgraded as required.

EirGrid has highlighted areas where the grid may have better capacity to connect large demand connections informed by the publication of the *Shaping Our Electricity Future*<sup>22</sup> decision. Information on network constraint is also provided in EirGrid and SONI’s *All-Island-Ten-Year-Transmission-Forecast-Statement-2019*<sup>23</sup>(TYTFS).

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<sup>22</sup> Shaping Our Electricity Future Roadmap; [https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping\\_Our\\_Electricity\\_Future\\_Roadmap.pdf](https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping_Our_Electricity_Future_Roadmap.pdf) , Source; EirGrid

<sup>23</sup> All-Island-Ten-Year-Transmission-Forecast-Statement-2019; <https://www.soni.ltd.uk/media/documents/All-Island-Ten-Year-Transmission-Forecast-Statement-2019.pdf> , Source; EirGrid

### Alternative technologies

One respondent suggested the use of electrolyzers in support of intermittent renewable sources by taking energy that would otherwise be curtailed and converting that energy into chemical energy in the form of hydrogen which could be used later when needed to produce electricity. Another respondent suggested the use of fuel cells in place of fossil fuel generation. These are novel suggestions which the CRU would support if developed, however the CRU consider these suggestions to be medium to long term in nature given the infrastructure requirements necessary for successful integration with the electricity grid and the lack of evidence of viability in Ireland of some of these alternative technologies. The threat to security of supply set out in this decision paper is imminent and thus requires an immediate effective response from the electricity demand side, in tandem with the responses proposed to address the generation capacity shortfall under the CRU's security of supply programme of actions.

### Level of Demand Flexibility

The CRU notes that industry stakeholders have highlighted the difficulty in designing measures that aid in mitigating the risk to security of supply when the level of demand flexibility needed from operators is unknown. The CRU understands that the electricity system is a complex and dynamic system and to provide an exact level of demand flexibility to industry stakeholders is difficult. EirGrid circulated an Information Note in March 2021 to data centre operators providing information on the level of demand flexibility that may be necessary from data centres in the near future. EirGrid also published a *Flexible Demand Operating Protocol* which sets out the operational arrangements in place between the SO and the customer for implementation of Flexible Demand at the customer site(s).

### Tariffs and Bonds

The CRU notes industry's appetite for a revision of tariffs structures and the introduction of bonds for demand side connections. While the introduction of such measures may provide financial security to the electricity consumer against the threat of stranded assets, these measures do not provide mitigation on the short term in addressing the worsening risk to security of supply. The CRU may explore this area further at a later date.

### Connection Measures being applied to data centres only

A number of respondents described the proposed approach (whereby only measures applicable to data centres are adopted) as unfair. Moreover, the respondents point out that further, broader alternatives exist, which would target all LEUs and not simply data centres.

In this regard, it should first be noted that these respondents are correct in their understanding that the measures proposed only apply to one class of demand connection customer, namely data centres. As such, the CRU has considered the principle of non-discrimination and the fact that this principle is not absolute and allows for differential treatment to be objectively justified.

For a measure to be objectively justified, it must be taken in furtherance of a legitimate objective and the measure itself must be proportionate. The CRU considers that an approach which only applies to data centres is in compliance with the principle of non-discrimination. Regardless of whether or not data centres are in a comparable situation with other LEUs, their differential treatment is, in any event, objectively justified for reasons set out below.

Firstly, the CRU has a duty to protect the security of supply to the grid and to take measures accordingly. As discussed above, security of supply is currently under threat and the CRU is obliged to take some steps to protect it. On this basis, a decision by the CRU to treat data centres differently is one taken in furtherance of the legitimate objective of protecting security of supply.

Further, the measures proposed are in the CRU's view proportionate. Looking to all the facts and the technical and scientific data available at this time, the current information available to the CRU indicates that the proposed mitigation measures for connections will address the issue of security of supply. A moratorium would also achieve the same effect. Accordingly, the measures are suitable for carrying out the CRU's objective.

The CRU also considers that the measures proposed go no further than is necessary for protecting security of supply, again according to the available data. As described in section 2.2, data centres are currently the largest demand driver of all demand connected customer groups. The large number of connection applications from the data centre sector, and the level of capacity sought in those applications, is unprecedented in Ireland.

Accordingly, the CRU considers that it is data centres which are disproportionately contributing to the problems for security of supply. Since this sector is disproportionately contributing to the problem, focusing on it alone by way of a flexible connection arrangement in attempting to protect security of supply does not go further than is necessary. If, on the

other hand, the CRU was to adopt measures which focused on all LEUs, such an approach would go further than is necessary since this would affect the current reasonable demand of these LEUs in circumstances where they are not responsible for the surge in demand and the threat to the security of supply, nor, it should be mentioned, are they likely to in future.

As a result, the CRU considers that applying focused measures to this class of demand customer is justifiable, appropriate, and proportionate given the unique challenge data centres currently pose to Ireland's electricity network, as outlined in this Decision.

## 5. Decision

Having considered the submission received in response to consultation, the CRU has decided that it is appropriate to proceed with a modified version of option 3 as set out in CRU/21/060. The CRU is of the view that this represents a balanced approach in that it provides for connection offers to be made to data centre applicants 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 assessment criteria will apply to all connection applications received for the connection of data centres at any location in Ireland, including those applications currently being processed. For clarity, the applications that are categorised by the SOs as “Connected” and “Contracted” in table 1 and table 2 contained in section 2.2 of this document are not subject to the Directions. All applications other than the “Connected” and “Contracted” categories are subject to the Directions.

The assessment criteria will have an immediate effect, upon issuance of the Directions to the SOs. A separate Direction will be issued to each of the SOs. These Directions are contained in appendices 2 & 3.

### **Assessment Criteria**

Pursuant to Section 34(1) of the Electricity Regulation Act 1999 (the Act), the CRU directs EirGrid as transmission system operator (TSO) & ESBN as distribution system operator (DSO) to assess applications for the connection of data centres by reference to the following assessment criteria to determine whether a connection offer can be made within the system stability and reliability needs of the electricity network:

- The location of the data centre applicant with respect to whether they are within a constrained or unconstrained region of the electricity system.
- The ability of the data centre applicant to bring onsite dispatchable generation (and/or storage) equivalent to or greater than their demand, which meets appropriate availability and other technical requirements as may be specified by the relevant SO, in order to support security of supply.
- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO 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 the relevant SO, in order to support security of supply.

- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO, in times of system constraint, in order to support security of supply.

Having considered the submissions received in response to consultation, the CRU has updated the Connection Measures which were proposed in CRU/21/060. In CRU/21/060, in which the assessment criteria were referred to as “*prioritisation criteria*”, it was proposed that the criteria outlined therein would be used by the SOs to *prioritise* applications to be processed. Under this decision, where the SO is not satisfied by reference to the assessment criteria that a connection offer can be made to an applicant consistent with the needs of the electricity system, the application will not be processed by the SO, accordingly, the application will terminate.

In CRU/21/060 it was stated that the criteria outlined therein were not ranked but that following the consultation period, a decision may be taken to prioritise the criteria. The CRU has decided not to rank or afford priority to certain criteria over others. The CRU considers that the SOs are best placed to understand the dynamics of their respective systems and should be afforded the flexibility in considering the assessment criteria to decide whether it is appropriate to make a connection offer.

The CRU will review this Decision and the ongoing need for further Directions as and when it considers it necessary to do so. The CRU will monitor the effectiveness of these assessment criteria in mitigating the risk to security of supply by way of bi-annual<sup>24</sup> reports which the SOs will be required to provide to the CRU.

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<sup>24</sup> First report due by 1 March 2022

## 6. 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;
- [CRU proposed Direction to the System Operators related to Data Centre grid connection](#) – CRU proposed Direction to the System Operators related to Data Centre grid connection, 08 June 2021
- [Secondary Fuel Obligations on Licensed Generation Capacity in the Republic of Ireland](#) - Secondary Fuel Obligations on Licensed Generation Capacity in the Republic of Ireland, 12 January 2009
- [Security of Electricity Supply - Programme of Actions](#) - Information Note, Security of Electricity Supply – Programme of Actions, 29 September 2021
- [Climate Action Plan 2021](#) – Department of Environment, Climate and Communications’ Climate Action Plan 2021, 04 November 2021
- [All-Island-Ten-Year-Transmission-Forecast-Statement-2019](#) – EirGrid and SONI’s All-Island-Ten-Year-Transmission-Forecast-Statement-2019
- [Capacity Market Rules](#) – Single Electricity Market Operator’s Capacity Market Rules, 16 April 2021
- [Shaping Our Electricity Future Roadmap](#) – EirGrid’s Shaping Our Electricity Future Roadmap, November 2021

## **Appendix 1: Direction Letter to EirGrid PLC relating to Data Centre Connections**

Mark Foley  
Chief Executive Officer  
EirGrid plc  
The Oval  
160 Shelbourne Road  
Dublin 4  
D04 FW28

23 November 2021

Our Ref: D/21/25841

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

Dear Mark,

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 followed on from a series of engagements between the CRU and 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.

On foot of this engagement, including your letter of 27 May 2021, on 8 June 2021 the CRU published a consultation paper CRU/21/060 “*CRU proposed Direction to the System Operators related to Data Centre grid connection*”, which sought engagement from the data centre community, relevant stakeholders and the wider public, on a selection of measures from which the CRU proposed to choose to address this challenge.

Having considered the responses received, on 23 November 2021 the CRU published its decision paper CRU21124 CRU Direction to the System Operators related to Data Centre grid connection processing Decision Paper (the Decision), and this Direction is intended to give effect to the determinations set out therein.

Pursuant to Section 34(1) of the Electricity Regulation Act 1999 (the Act), the CRU directs EirGrid as transmission system operator (TSO) to assess applications for the connection of data centres by reference to the following assessment criteria to determine whether a connection offer can be made within the system stability and reliability needs of the electricity network:

- The location of the data centre applicant with respect to whether they are within a constrained or unconstrained region of the electricity system.
- The ability of the data centre applicant to bring onsite dispatchable generation (and/or storage) equivalent to or greater than their demand, which meets appropriate

availability and other technical requirements as may be specified by the relevant SO, in order to support security of supply.

- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO 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 the relevant SO, in order to support security of supply.
- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO, in times of system constraint, in order to support security of supply.

The CRU further directs EirGrid to monitor the implementation of the above measures and to notify the CRU if those measures sufficiently address the challenges outlined in the Decision.

The CRU will review the Decision and the ongoing need for further Directions as and when it considers it necessary to do so.

Yours sincerely,

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Jim Gannon

Commissioner

## **Appendix 2: Direction Letter to ESBN DAC relating to Data Centre Connections**

Nicholas Tarrant

Managing Director  
ESB Networks DAC  
Clanwilliam House  
Clanwilliam Place  
Dublin 2

23 November 2021

Our Ref: D/21/25842

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

Dear Nicholas,

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 followed on from a series of engagements between the CRU and 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.

On foot of this engagement, including EirGrid's letter of 27 May 2021, on 8 June 2021 the CRU published a consultation paper CRU/21/060 "*CRU proposed Direction to the System Operators related to Data Centre grid connection*", which sought engagement from the data centre community, relevant stakeholders and the wider public, on a selection of measures from which the CRU proposed to choose to address this challenge.

Having considered the responses received, on 23 November 2021] the CRU published its decision paper CRU21124 CRU Direction to the System Operators related to Data Centre grid connection processing Decision Paper (the Decision), and this Direction is intended to give effect to the determinations set out therein.

Pursuant to Section 34(1) of the Electricity Regulation Act 1999 (the Act), the CRU directs ESBN as distribution system operator (DSO) to assess applications for the connection of data centres by reference to the following assessment criteria to determine whether a connection offer can be made within the system stability and reliability needs of the electricity network:

- The location of the data centre applicant with respect to whether they are within a constrained or unconstrained region of the electricity system.
- The ability of the data centre applicant to bring onsite dispatchable generation (and/or storage) equivalent to or greater than their demand, which meets appropriate

availability and other technical requirements as may be specified by the relevant SO, in order to support security of supply.

- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO 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 the relevant SO, in order to support security of supply.
- The ability of the data centre applicant to provide flexibility in their demand by reducing consumption when requested to do so by the relevant SO, in times of system constraint, in order to support security of supply.

The CRU further directs ESBN to monitor the implementation of the above measures and to notify the CRU if those measures sufficiently address the challenges outlined in the Decision.

The CRU will review the Decision and the ongoing need for further Directions as and when it considers it necessary to do so.

Yours sincerely,

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Jim Gannon

Commissioner

## **Appendix 3: 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](mailto: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.

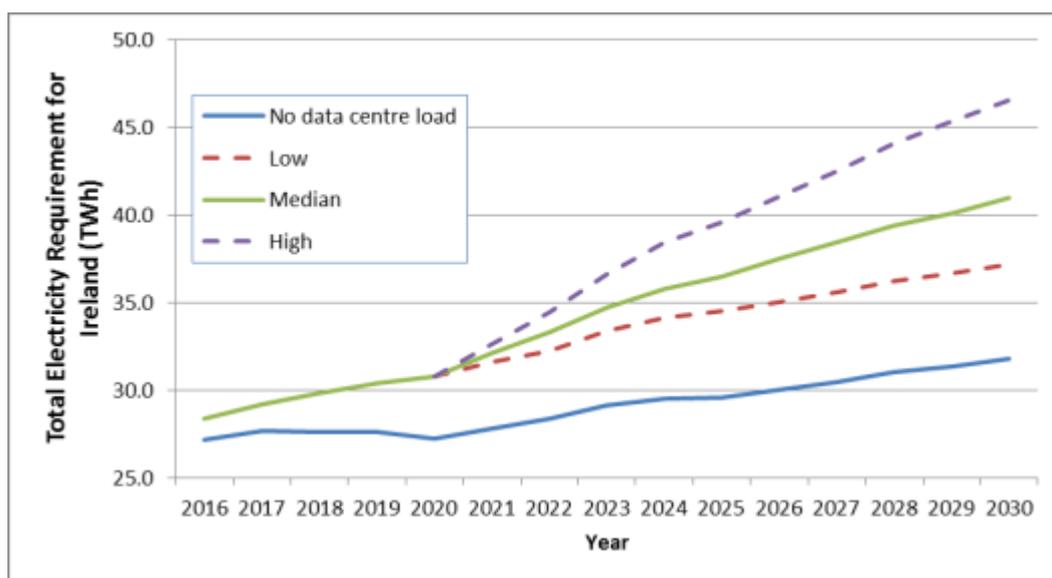
EirGrid has the obligation to plan, operate and develop, where necessary, a safe, secure, reliable, economic and efficient transmission system with a view to ensuring all *reasonable demands* for electricity are met (emphasis added). The transmission system has to date generally been able to accommodate 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.

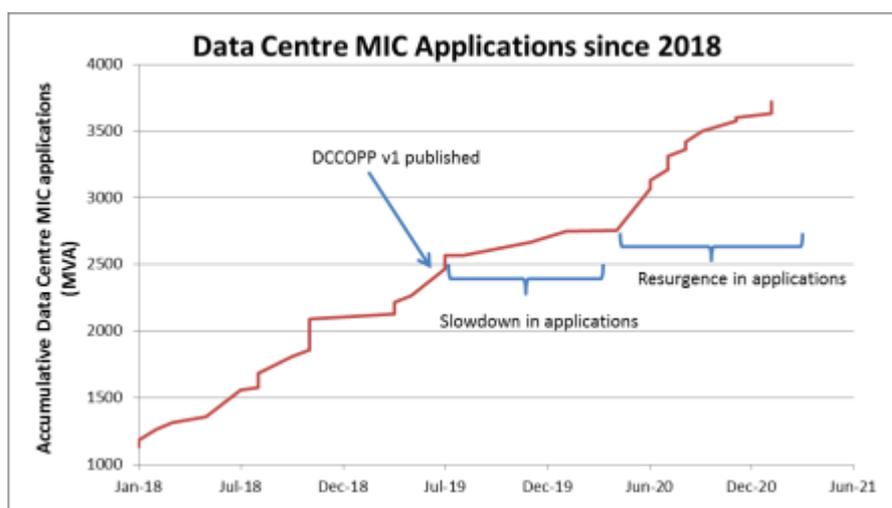
Moreover, with the energy transition we are operating against a changed policy context and we need to be cognisant in terms of the development of the system with a view to the efficient deployment of infrastructure and doing so in a manner which supports Ireland’s decarbonisation ambitions as articulated 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, Amsterdam<sup>25</sup> halted the issuance of building permits for data centres in certain parts of the city due to concerns relating to grid capability, and Singapore<sup>26</sup> 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 Strategy<sup>27</sup> confirms the strategic significance of data centres for Ireland. This is further underpinned in the Government's Climate Action Plan in 2019<sup>28</sup>. 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

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<sup>25</sup> <https://www.bloomberg.com/news/articles/2019-07-16/too-much-information-amsterdam-hits-pause-on-data-center-boom>

<sup>26</sup> <https://www.channelnewsasia.com/news/business/new-data-centres-singapore-temporary-pause-climate-change-14719154>

<sup>27</sup> <https://dbei.gov.ie/en/Publications/Publication-files/Government-Statement-Data-Centres-Enterprise-Strategy.pdf>

<sup>28</sup> [https://www.dcae.gov.ie/en-ie/climate-action/publications/Documents/16/Climate\\_Action\\_Plan\\_2019.pdf](https://www.dcae.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.

## **Annex 1: List of Non-Confidential Respondents**

### **Non-confidential responses to “CRU proposed Direction to the System Operators related to Data Centre grid connection” (CRU/21/060)**

These responses are published alongside this decision paper on the CRU website – Electricity Connection Policy section.<sup>29</sup>

1. Dataplex Group
2. SFI Research Centre for Energy, Climate and Marine research and innovation (MaREI)
3. EirGrid
4. Belmont Data Centres
5. Mr. Tony Philips
6. West Tyrone Against Wind Turbines (WTAWT)
7. Host in Ireland
8. Mr. Aidan Whelan
9. Not Here Not Anywhere
10. Nautilus Data Technologies Ireland Limited
11. Eastmont Developments Ltd.
12. Mr. Owen Martin
13. Mr. Val Martin
14. Microsoft
15. Department of Enterprise, Trade and Employment
16. Councillor Elaine McGinty
17. Cloud Infrastructure Ireland
18. Dublin Chamber
19. Clare County Council
20. Futureproof Clare
21. Cork Chamber
22. Demand Response Association of Ireland
23. Enchanted Rock
24. ESB Generation and Trading, Peter Davis

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<sup>29</sup> Electricity Connection Policy; [https://www.cru.ie/document\\_group/electricity-connection-policy-2/](https://www.cru.ie/document_group/electricity-connection-policy-2/)  
Source; CRU

25. ESB Generation and Trading, Paraic Higgins
26. Bord Gais Energy (BGE)
27. Greener by Design on behalf of Mayo Renewable Ltd.
28. Environmental Pillar
29. Electricity Association of Ireland
30. Senator Alive-Mary Higgins
31. Mr. Andrew Clarke
32. Clarke Energy Ltd.
33. An Taisce
34. SSE Renewables
35. Wind Energy Ireland (WEI)
36. EngineNode
37. Mr. Dean Dempsey
38. ESB Networks (ESBN)
39. Gluaiseacht
40. Bord na Mona
41. MT Advisory Services Ltd. on behalf of Moffash Ltd and Profile Park Co. 1 Ltd.
42. Industrial Development Agency (IDA)
43. Friends of the Earth
44. Sustainable Energy Authority of Ireland (SEAI)
45. Amazon Web Services (AWS)