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# Large Energy User Connection Policy

CRU Consultation Response

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## Table of Contents

<b>1</b>	<b>INTRODUCTION</b>	<b>7</b>
<b>2</b>	<b>FOUND<b>DIGITAL</b> DS</b>	<b>7</b>
<b>3</b>	<b>CATEGORY OF LEU TO WHICH THIS POLICY APPLIES</b>	<b>7</b>
3.1	QUESTION 1:	7
3.2	RESPONSE:	7
3.3	QUESTION 2:	7
3.4	RESPONSE:	8
<b>4</b>	<b>TRANSITION PERIOD</b>	<b>8</b>
4.1	QUESTION 3:	8
4.2	RESPONSE:	8
4.3	QUESTION 4:	8
4.4	RESPONSE:	8
4.5	QUESTION 5:	9
4.6	RESPONSE	9
4.7	QUESTION 6:	9
4.8	RESPONSE:	9
<b>5</b>	<b>MEASURING PERFORMANCE</b>	<b>10</b>
5.1	QUESTION 7:	10
5.2	RESPONSE:	10
5.3	QUESTION 8:	10
5.4	RESPONSE:	10
5.5	QUESTION 9:	10
5.6	RESPONSE:	11
5.7	QUESTION 10:	11
5.8	RESPONSE:	11
5.9	QUESTION 11:	11
5.10	RESPONSE:	11
5.11	QUESTION 12:	11
5.12	RESPONSE:	12
5.13	QUESTION 13:	12
5.14	RESPONSE:	12
5.15	QUESTION 14:	12
5.16	RESPONSE:	12
<b>6</b>	<b>LOCATION OF LEUS</b>	<b>12</b>

# CRU Consultation Response

Large Energy User Connection Policy



FOUND**DIGITAL** DS

6.1	QUESTION 15:	12
6.2	RESPONSE:	12
6.3	QUESTION 16:	13
6.4	RESPONSE:	13
6.5	QUESTION 17:	13
6.6	RESPONSE:	13
6.7	QUESTION 18:	13
6.8	RESPONSE:	14
6.9	QUESTION 19:	14
6.10	RESPONSE:	14
6.11	QUESTION 20:	14
6.12	RESPONSE:	14
<b>7</b>	<b>NON-FIRM DEMAND CONNECTIONS</b>	<b>14</b>
7.1	QUESTION 21:	14
7.2	RESPONSE:	15
7.3	QUESTION 22:	15
7.4	RESPONSE:	15
7.5	QUESTION 23:	15
7.6	RESPONSE:	15
7.7	QUESTION 24:	15
7.8	RESPONSE:	16
7.9	QUESTION 25:	16
7.10	RESPONSE:	16
7.11	QUESTION 26:	16
7.12	RESPONSE:	16
7.13	QUESTION 27:	16
7.14	RESPONSE:	16
<b>8</b>	<b>ON-SITE GENERATION AND STORAGE</b>	<b>17</b>
8.1	QUESTION 28:	17
8.2	RESPONSE:	17
8.3	QUESTION 29:	17
8.4	RESPONSE:	17
8.5	QUESTION 30:	18
8.6	RESPONSE:	18
<b>9</b>	<b>DEMAND FLEXIBILITY</b>	<b>18</b>
9.1	QUESTION 31:	18
9.2	RESPONSE:	18
9.3	QUESTION 32:	19
9.4	RESPONSE:	19
9.5	QUESTION 33:	19
9.6	RESPONSE:	19

# CRU Consultation Response

Large Energy User Connection Policy



FOUND**DIGITAL** DS

9.7	QUESTION 34:	19
9.8	RESPONSE:	19
9.9	QUESTION 35:	19
9.10	RESPONSE:	19
9.11	QUESTION 36:	20
9.12	RESPONSE:	20

## 10 ENERGY EFFICIENCY & DISTRICT HEATING 20

10.1	QUESTION 37:	20
10.2	RESPONSE:	20
10.3	QUESTION 38:	20
10.4	RESPONSE:	20
10.5	QUESTIONS 39:	21
10.6	RESPONSE:	21

## 11 GAS 21

11.1	QUESTION 40:	21
11.2	RESPONSE:	21
11.3	QUESTION 41:	21
11.4	RESPONSE:	21
11.5	QUESTION 42:	22
11.6	RESPONSE:	22
11.7	QUESTION 43:	22
11.8	RESPONSE:	22
11.9	QUESTION 44:	22
11.10	RESPONSE:	22
11.11	QUESTION 45:	22
11.12	RESPONSE:	23
11.13	QUESTION 46:	23
11.14	RESPONSE:	23

## 12 CONNECTION CONSIDERATIONS 23

12.1	QUESTION 47:	23
12.2	RESPONSE:	23
12.3	QUESTION 48:	23
12.4	RESPONSE:	23
12.5	QUESTION 49:	24
12.6	RESPONSE:	24
12.7	QUESTION 50:	24
12.8	RESPONSE:	24
12.9	QUESTION 51:	24
12.10	RESPONSE:	24

# CRU Consultation Response

Large Energy User Connection Policy



FOUND**DIGITAL** DS

<b>13</b>	<b>ROLES OF OTHER ORGANISATIONS</b>	<b>24</b>
13.1	QUESTION 52:	24
13.2	RESPONSE:	25
13.3	QUESTION 53:	25
13.4	RESPONSE:	25
13.5	QUESTION 54:	25
13.6	RESPONSE:	25
<b>14</b>	<b>GENERAL COMMENTS</b>	<b>25</b>
14.1	APPLICABILITY OF NEW POLICIES	25
14.2	RENEWABLE ENERGY CLUSTERS	26
14.3	FIRM VS. NON FIRM POWER AND GAS.	26
14.4	TRANSITION PERIOD	26
14.5	PATH FORWARD	26

# CRU Consultation Response

Large Energy User Connection Policy



FOUND**DIGITAL** DS

## Revision History

<b>Revision</b>	<b>Date</b>	<b>Author</b>	<b>Description</b>
1	18.03.24	CdP	Preliminary / Draft
2	18.03.24	CdP, WC	Internal Review Revision
3	19.03.24	CdP, WC	Intro review



## 1 Introduction

This document provides responses to the Options for Connections Criteria section within the CRU consultation paper on Review of Large Energy Users connection policy (CRU2024001), published on 15 January 2024.

The subsequent section headings and question reference correlate to that in the above document.

## 2 FoundDigital DS

FoundDigital DS are leaders in power infrastructure analysis and advisory services, primarily focussed on renewable generation, technology demand users, power and gas infrastructure, and championing the road to net zero.

## 3 Category of LEU to which this policy applies

### 3.1 Question 1:

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

### 3.2 Response:

We support ESNB's proposal that this policy should apply to DG10 and transmission connected (TCON) only. Potentially having on-site generation at each low or medium voltage interconnections is less efficient than having generation only at sites that have more significant capacity and usage.

### 3.3 Question 2:

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



## 3.4 Response:

See Response to Question 1.

## 4 Transition Period

### 4.1 Question 3:

Comments are invited from interested parties on the proposed use of a transition period/glide path in relation to (i) the changing requirements at time of connection on the transition to zero real time emissions, and (ii) once connected, the changing requirements as the project transitions closer to real time zero e.g. from non-firm connection to firm connection linked to milestones.

### 4.2 Response:

We appreciate the CRU's review and proposal of a glide path which will support continued investment in the Irish economy. It's important however that the end goal or the requirements at the end of the glide path be clear at the time application and connection. Developing a large energy facility requires significant capital investments and making investments to future proofing the project is difficult if all of the requirements are not well defined.

Furthermore, the glide path should be aligned with renewable fuel source availability expansion targets. In doing so will ensure realistic and achievable milestones.

It is our view that incentive schemes will accelerate investment in renewable technologies, to support the move to net zero.

### 4.3 Question 4:

Please provide views on the proposed timing of different options.

### 4.4 Response:

Measuring performance – real time net zero glide path. We support the renewable energy clusters or energy parks proposal and believe it's more efficient to measure net zero at nodes upstream of individual customers. Large Energy Users would still be incentivized to locate close to renewables and where it makes efficient use of the electricity grid. With







that, we recommend an approach where individual customer’s net zero measurement allows for inclusion of multiple meters within the energy park upstream of the large energy user’s meter. (A virtual net zero measurement approach)

Location – we appreciate the CRU recognizing that location matters. We recommend that firm vs non firm connection be based on whether the proposed location is in a constrained or unconstrained part of the energy system. Better definition would be required to help the system operators and customers understand what is considered a constrained region or not.

Flexibility – we recommend utilizing the market for demand flexibility participation and not tie it to connection offers.

Gas – Similar to electric, firm vs. non firm gas supply should be tied to whether the proposed location has significant infrastructure constraints. Better definition would be required to help the system operators and customers understand what is considered a constrained region or not.

## 4.5 Question 5:

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

## 4.6 Response

No comment.

## 4.7 Question 6:

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

## 4.8 Response:

We are interested to see how studies such as ESB’s “Scenarios for 15-20% Flexible System Demand” are further developed to help deliver towards CAP 23 action EL/23/24 which has the aim of 20 to 30% of electricity demand to be flexible by 2030 (15-20% flexibility by 2025).





## 5 Measuring Performance

### 5.1 Question 7:

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

### 5.2 Response:

We support the use of timestamped GOs / similar certification; however such certification should take account of proximity of the renewable generators to the LEU. In doing so will avoid wheeled PPAs where generators are located in other countries, and ensure investment in the Irish renewable energy infrastructure.

### 5.3 Question 8:

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

### 5.4 Response:

In order to achieve real time net zero will not only require renewable generation sources that are readily available to all users, but should also take account of other initiatives to benefit secondary users of energy such as heat export to a district heating network. This will require necessary metering, reporting and an agreed approach to the holistic net carbon use.

### 5.5 Question 9:

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





## 5.6 Response:

Datacentre facilities implement sophisticated metering, which should be relatively easily adapted (as needed) to provide real time reporting. There will however be a need to agree on calculation methodology, reporting protocol requirements, security, confidentiality of data to name a few.

With respect to energy sources, a coordinated methodology should be agreed to account for both electricity and gas connections to avoid parallel reporting.

The glide path to reporting real time net zero should match that of the forecast to 100% renewable generator infrastructure availability.

## 5.7 Question 10:

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

## 5.8 Response:

See response to Question 9.

## 5.9 Question 11:

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

## 5.10 Response:

See response to Question 7.

## 5.11 Question 12:

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





## 5.12 Response:

No comment.

## 5.13 Question 13:

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

## 5.14 Response:

See response to Question 9.

## 5.15 Question 14:

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

## 5.16 Response:

See response to Questions 8 & 9.

## 6 Location of LEUs

### 6.1 Question 15:

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

### 6.2 Response:

The impact on the system operator's ability to provide reliable power to all customers is important as well as meeting Ireland's climate goals. The impact of a proposed location should drive connection conditions or incentives as the CRU suggest and not be a mandate. However, it should be well defined so customers can adequately plan for it. For example, if a proposed location is located near renewables and an unconstrained part of the energy



system, a faster connection with less onerous requirements makes sense. If the proposed location is located close to an oversupply of renewables where the power system is constrained due to the renewable and the large energy user could alleviate those constraints, a faster connection with less onerous requirements and an incentive is warranted.

See also response to Question 7.

## 6.3 Question 16:

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

## 6.4 Response:

Less onerous requirements and incentives if the proposed location of a large energy user defers network investments by having consistent energy usage relieves the capacity constraint in that energy cluster (in the case of co-locating in a region with over supply of renewable vs. the transmission system capability).

## 6.5 Question 17:

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

## 6.6 Response:

No comment.

## 6.7 Question 18:

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



## 6.8 Response:

Well defined energy clusters is important with annual reports published by the system operators identifying current and future (example timeline 1year, 5 year, and 10 year) projected constraints.

The proximity should be based on constraints in each energy cluster.

## 6.9 Question 19:

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

## 6.10 Response:

Network operators should clearly define energy clusters based on up to date understanding of network constraints.

See also response to Question 18.

## 6.11 Question 20:

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

## 6.12 Response:

No comment.

## 7 Non-firm Demand Connections

### 7.1 Question 21:

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





## 7.2 Response:

Flexibility provided to the large energy user is important. If a LEU requests 100MW but 80MW is the threshold before large grid investments are required, the LEU should be able to choose to connect 80MW on a firm basis and 20MW on a non-firm basis or connect up to 80MW only on a firm basis and wait for grid investments are completed.

A LEU should also continue to have the option of installing generation (subject to a glide path to carbon free generation) to self-serve during times of peak demand or participate in demand flexibility services and export to the grid.

## 7.3 Question 22:

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

## 7.4 Response:

No comment.

## 7.5 Question 23:

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

## 7.6 Response:

We welcome a policy where all LEUs are subjected to the same requirements.

## 7.7 Question 24:

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



# CRU Consultation Response

Large Energy User Connection Policy



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## 7.8 Response:

It should be proportional and based on the level of constraint in the energy cluster.

## 7.9 Question 25:

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

## 7.10 Response:

No comment.

## 7.11 Question 26:

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

## 7.12 Response:

No comment.

## 7.13 Question 27:

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

## 7.14 Response:

No comment.







## 8 On-site Generation and Storage

### 8.1 Question 28:

Comments are invited on the use of renewable generation and storage on-site. Should this be used to match LEUs demand on-site or to provide flexibility services to the system? Please provide reasons and rationale for any views provided.

### 8.2 Response:

The location of large energy users has been driven by its intended use and whether the location enables that. Data centers are located for example where power, gas, and fiber are available and typically proximate to metro centers so getting to and from the data centers is convenient for the employees and customers. Solar and wind siting strategy is likely very different.

The economics of a proposed development is important as well. Data center developers are purchasing land at market prices for data center development which is far greater than solar development. The economics would likely be cost prohibitive for a data center developer to purchase land at data center prices and utilize majority of that land to generate power to meet the data center energy demand.

Furthermore, exporting to the grid when the incoming connection is on a non-firm / flexible basis will prevent data center operators from providing the level of reliability their customers require

### 8.3 Question 29:

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

### 8.4 Response:

If supply is constrained, market prices for the indigenous renewable fuel would likely be the mechanism to match demand. Run hours being a condition or limitation of connection would be unnecessary and possibly dangerous in influencing fuel prices.





## 8.5 Question 30:

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

## 8.6 Response:

Yes. Operations of back up generation is typically for testing and maintenance only and used as a back-up resource to the power system. In an unconstrained market where there is management demand and supply (both renewable and non-renewable), LEUs would typically run their backup generations minimally.

The number of running hours will also be dependent on the extent of flexibility with non-firm / flexible grid connections.

## 9 Demand Flexibility

### 9.1 Question 31:

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

### 9.2 Response:

LEU's can contribute and support CAP23 and should be given flexibility in how it participates. LEU can propose to build on-site generation using renewable fuels to reduce demand on the system during peak times. LEUs can propose to build or contract with a 3rd party developer and operator to site a renewable generation only plant within it's energy cluster and participate in demand response programs. The programs should be voluntary and market incentives should be the mechanism to encourage participation. Participation would likely increase as battery technology improves and costs continue to decrease, as renewable fuels and associated infrastructure becomes more prevalent, additional renewable energy technology develops such as floating wind.





## 9.3 Question 32:

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

## 9.4 Response:

Demand flexibility should be proportionate and based on constraints in the energy cluster.

## 9.5 Question 33:

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

## 9.6 Response:

See response to Question 32.

## 9.7 Question 34:

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

## 9.8 Response:

Expedited realisation of new connections as compared to those where demand flexibility is not required, will influence adoption.

## 9.9 Question 35:

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

## 9.10 Response:

We welcome a policy where all LEUs are subjected to the same requirements.



## 9.11 Question 36:

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

## 9.12 Response:

See response to Question 32.

# 10 Energy Efficiency & District Heating

## 10.1 Question 37:

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

## 10.2 Response:

We welcome the incorporation of waste heat re-use from LEU sites, however policies are required to agree:

- Proximity of LEU to existing district heating networks
- Metering and incorporation in the net zero calculation
- Grade heat expected to be exported. Data centers export low grade heat, which will require further heating (by others) to meet district heating scheme temperature grades. As a consequence, heat export from DC developments are rarely realised.

## 10.3 Question 38:

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

## 10.4 Response:

See response to Question 37.

## 10.5 Questions 39:

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

## 10.6 Response:

See response to Question 37.

## 11 Gas

### 11.1 Question 40:

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

### 11.2 Response:

No comment.

### 11.3 Question 41:

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

### 11.4 Response:

This should be proportionate to the constraints within the energy cluster.

## 11.5 Question 42:

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

## 11.6 Response:

The method of production, location of production, delivery of green hydrogen to site are important factors in order to assess viability. For example, delivery by tanker does not support the ambition to net zero.

## 11.7 Question 43:

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

## 11.8 Response:

No comment.

## 11.9 Question 44:

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

## 11.10 Response:

No comment.

## 11.11 Question 45:

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



## 11.12 Response:

In a data center application, gas generation as primary power source is usually only considered where the incoming electrical utility is provided on a non-firm basis.

When both incoming electrical and gas connections are offered on a non-firm basis, this introduces a huge amount uncertainty and will not be acceptable to end customers.

## 11.13 Question 46:

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

## 11.14 Response:

No comment

# 12 Connection Considerations

## 12.1 Question 47:

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

## 12.2 Response:

No comment.

## 12.3 Question 48:

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

## 12.4 Response:

We are in support of different criteria being mandated based on location or rather impact of the proposed LEU will have to the network. Having detailed criteria as part of the





enduring connection policy is important and to differentiate what are optional and mandatory.

## 12.5 Question 49:

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

## 12.6 Response:

No comment.

## 12.7 Question 50:

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

## 12.8 Response:

No comment.

## 12.9 Question 51:

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

## 12.10 Response:

No comment.

## 13 Roles of other organisations

### 13.1 Question 52:

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







## 13.2 Response:

No comment.

## 13.3 Question 53:

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

## 13.4 Response:

See responses no performance measurement section.

## 13.5 Question 54:

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

## 13.6 Response:

No comment.

# 14 General Comments

## 14.1 Applicability of New Policies

There are a number of applications that have been submitted prior to CRU's Call for Evidence Paper published on June 23, 2023. It is important that clarity be achieved expeditiously and pending application be given guidance on whether they are exempt from new policies or if what new requirements will be placed on them. We urge the CRU to recognize that some pending applications may have already worked with local jurisdictions for permitted so some requirements be onerous and could materially harm the investment.



## 14.2 Renewable Energy Clusters

We support the definition and use of renewable energy clusters as a solution to individual Large Energy Users being required to be net zero at their meter. There is however a need to recognise realistic roadmap to net zero due to availability of indigenous renewable generation.

## 14.3 Firm vs. Non Firm Power and Gas.

Our view is that it's important to not have a one size fit all model. In unconstrained areas, there should be no reason not to offer firm power and gas contracts. Furthermore, the ability to tolerate flexible connections in a data centre implementation will rely largely on whether one of the two incoming supplies can be provided on a firm basis.

In addition, a significant factor in firm vs flexible are the consequential footprint requirements to comply with export and fuel storage requirements.

The assessment of whether a firm or flexible connection is appropriate for a LEU should be cognisant of the nature of both fuel sources.

## 14.4 Transition Period

We support the recognition of policy goals and what's market ready. We support carbon free generation but sustainable resources, supply, and infrastructure for renewable fuels like hydrogen are not readily available in Ireland. With that, we support a transition period.

## 14.5 Path Forward

How will the CRU and GNI proceed to enable the path forward for Large Energy Users? Timeline would be greatly appreciated.