

CLEAR Consulting
CRU - Review of Large Energy Users connection policy - Questions

	Category of LEU to which this policy applies	Proposed Response
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?).	<p>Could LEUs be categorised on net energy usage (in cases where they generate renewable energy on site - but need top up from grid?)</p> <p>Also the LEUs should be categorised</p> <ul style="list-style-type: none"> - in terms of importance to national interests - e.g. hospitals, pharma plants, data centres (which support hospitals, banking). It would make sense to prioritise these 'social' projects rather than industries such as manufacturing plants, distilleries etc. - MW demand of LEU - Flexibility - can the LEU shift high energy demand operations to times of either (i) times of low national demand (ii) times of high/surplus energy production - LEUs initiatives/plans (present or in future) for energy production and/or efficiencies - Contribution to Ireland's CAP/Carbon targets - e.g. provide funding to green initiatives/renewable energy programs
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.	<p>Yes it should - as smaller LEUs can play a key role in helping Ireland achieve it's CAP/Carbon targets. Some smaller LEUs are involved with innovative and emerging technologies that can contribute to the decarbonisation of the energy system. If they are included in this category - it can promote further development of these technologies and thus help Ireland achieve it's CAP/Carbon targets along the way.</p> <p>LEUs should be categorised in terms of importance to national interests.</p> <p>Timeline - this depends on the current state of the technologies (market ready), regulations</p>
Transition period		
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	Please provide views on the proposed timing of different options.	
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?	
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	
Measuring Performance		
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.	<p>Timestamped GOs:</p> <ul style="list-style-type: none"> - transparent and verifiable record of renewable energy - real time tracking - aligns consumption with generation - help demonstrate LEUs commitment to decarbonisation <p>Renewable Energy Certificates:</p> <ul style="list-style-type: none"> - confirms production of renewable energy in MWh - allows LEUs to offset carbon footprint by purchasing RECs to offset consumption - funds can go towards future upgrades/expansions of Renewable Energy generation projects
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.	<p>Yes - should be set as a target and LEUs (with support from SOs and Government) should strive to achieve these goals - as they are part of Ireland's CAP/Carbon targets.</p> <p>However - this cannot be done overnight - so there should be other measures along the way:</p> <ul style="list-style-type: none"> - interim targets: emissions reduction, Renewable Energy usage (or production) etc. - along with incentives for LEUs hitting said targets - periodic reporting: reporting on progress for emissions and progress towards zero - carbon offsetting/budgeting - Carbon Neutral Certification - Technological innovation and deployment - investment in low carbon technologies and renewable energy technologies - e.g. storage, production, carbon capture etc
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.	
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.	
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.	<p>Sources of Renewable Energy (Wind/Solar) or Renewable Gas - help to ensure electricity/gas security for Ireland by reducing reliance on fossil fuel generated electricity. They also help Ireland to achieve it's CAP/Carbon goals.</p> <p>These also provide additional benefits such as:</p> <ul style="list-style-type: none"> - job creation - grid stability
12	Comments are invited on how the storage of renewable energy is captured by any measurement system when this stored renewable energy is used.	Metering - measure in and measure out
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?	Yes - by metering separately
14	Comments are invited on who should have responsibility for measuring LEUs emissions and emissions abatement performance?	<ul style="list-style-type: none"> - LEU Operators - should measure and monitoring and reporting on their own emissions - Regulatory Bodies - e.g. EPA - System/Grid Operators - Independent 3rd Party Assessors - perhaps in cases of a dispute between LEU/Regs/SOs
Location of LEUs		
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.	<p>As most renewable generation sites would be rural - therefore land should be cheaper and may provide another advantage for locating LEUs near these sites - potential savings made by the LEUs could be invested in the power generation site - and possibly the LEUs could receive discounted rates for energy consumption if they contribute to the renewable energy generation</p> <p>Also by locating LEUs close to areas of renewable generation/storage - this will assist in areas of curtailment and constraint.</p>
16	What type of measures to facilitate this approach could be introduced to encourage new LEUs to locate close to renewable generation.	<p>Financial incentives - grants, tax credits, feed in tariffs - can help developer of LEU to reduce cost of building.</p> <p>Planning/Zoning Regulations - by implementing zoning regulations near renewable generation sites - could speed up the planning/permitting cycle - allowing LEU to complete construction in quicker time.</p> <p>Public Private Partnerships - can help improve infrastructure. Encourage LEUs to locate to near Renewable Energy sites.</p> <p>Marketing/Public Awareness Campaign - highlight the local environmental and economic and social benefits to LEUs locating close to Renewable Energy Generation sites.</p>

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?	Exemptions for certain LEUs may depend on what additional services they require that may not be feasible to bring to the renewable generation site - such as large water usage, reliable network connection (data centres, pharma plants etc). Another exemption could be the LEUs ability to be flexible with its demand - i.e. it can shift high usage activities to times of low demand (or high renewable energy production) - to help remove constraint on the grid. Local Authority Planners - along with LEUs should review zoning around areas of Renewable Energy generation to see if what services are feasible to bring to this area - then this would determine what types of LEU are appropriate for this area.
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?	The closer the better - as this helps with reduction of power losses across longer transmission routes. The LEUs requiring more net energy should be located closer to the generation site (to help reduce losses) - with lower demand sites located further away. This would be subject to spatial requirements and availability.
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?	Planners and Developers should review the energy demand against the energy available in these areas with SOs and
20	If introduced on a mandatory basis should locational requirements be implemented using a glide path?	Yes - as it takes time to design, develop and construct these plants in rural areas (taking the assumption that generation sites are located in rural areas and services such as water, fibre etc. may not necessarily be readily available) - but incentives should be offered to LEUs for earlier completion - such as grants, tax credits etc.
Non-firm demand connections		
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.	Certain LEUs may not be able to co-locate with Renewable Energy generation sites (accessibility to water, fibre, spatial limits). If these LEUs are able to shift demand requirements to times of low demand and/or times of high renewable energy production/surplus - then non firm LEU connections should be introduced. This will help (i) reduce the constraint on the grid (ii) help Ireland grow it's economy while helping to maintain/lower energy demand on the system. They should not be on an enduring basis as this offers no incentive for the LEU to review it's energy requirements and reliability on the grid and therefore could be a risk to future grid constraint should the LEUs require more energy or need to move operations to peak demand times.
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.	A timeline to be agreed when the LEU expects to achieve demand stability. Also - to move from non-firm to firm, infrastructure upgrades may be required to facilitate the increased demand. These upgrades need to be factored into the time line. Other requirements for the LEU to be given non-firm connections is their commitment to contributing to the production of renewable energy - either by having on site generation or investing in infrastructure that can help to increase renewable energy generation.
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?	If an LEU can provide either on site generation/stoerage for times of high demand or they invest in a renewable energy generation to offset their demands - even if the generation site is not located near the LEU or the electricity provider.
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?	This will depend on a number of factors: - flexibility of both the system and the LEU - how much can either require/produce - infrastructure constraints: grid capacity - market Dynamics : e.g. demand response programs, higher penetration of renewable energy - regulatory standards: consumer protection, reliability, resource adequacy
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?	Incentives could be reduced rates for energy usage if the LEU can stick to the non-peak times for energy demand. Also - if LEUs contribute to renewable energy production (either financially or physically) - this could be a 'selection' criteria
26	How should the SOs deploy this flexibility provided by non-firm demand?	The SOs could work with the LEUs to better understand the demand profiles/timelines for the LEU and other demand users - to help predict/plan best times for demand usage for the LEU(s). Other areas the SO's could assist are in: - demand response programs - real time market operations - capacity planning - grid balancing These are all areas the SO has access to and ability to monitor and control.
27	Should non-firm/flexible electrical connections be provided to islanded LEUs in order to facilitate flexibility between the electrical and gas systems?	Yes - for a few reasons - improved energy security: by allowing these LEUs bi-firm/flexible connections - it opens them up to access renewable energy which reduces the demand on gas/electricity - energy diversification: LEUs can optimise their energy needs based on availability - integration of renewable energy: this will allow the importing of renewable energy at times of high production or even the export of renewable energy (if the LEU is generating on-site) during times of excess production.
On-site generation and storage		
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.	Hrivate Network Projects should be permitted to connect to the national electricity grid for a) supplying electricity (demand and excess) and b) drawing from the grid, where energy drawn is limited to the amount they produce - which can be monitored by metering. The use of renewable generation and storage on an LEU site can help reduce the constraint on the existing network. It is also possible that excess energy produced by the LEU could be stored on site (for times of high demand) or supplied to the grid - to be used (or stored) elsewhere - again to help reduce constraint on the grid. These connections should be metered to measure what level of energy is produced/consumed by the LEU.
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	Yes - if renewable fuels are limited, then the usage should be carefully planned. Otherwise it increases the risk of dependency on fossil fuels. It makes more sense to encourage the building of renewable energy generation (solar/wind) and/or stoerage at these sites to reduce reliance on fuels (be they renewable or fossil)
30	Do LEUs require back-up generation for operational reasons? If so, what is the typical annual running hours of this back-up generation?	Some LEUs will require back up generation for operational reasons - caused by: - black/brown outs, - on site renewable generation/storage is lower than demand Typical running hours - this will vary on project to project - but would normally be limited as part of planning application.
Demand flexibility		
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	Demand Flexibility Services provided by new LEUs can lead to both by: System Support - shifting demand to times of larger RE generation - reduce curtailment and constraint issues - improved and more efficient grid infrastructure/network - reduced cost of energy for the end user - improved surety of supply for LEUs and smaller domestic users Decarbonisation - increased access to renewable energy - achieving the countries CAP23 targets - reduction in use of Natural Gas and other fossil fuels for energy production

32	Should demand flexibility services be mandatory or voluntary for new LEUs? Please provide reasons and rationale for any views provided?	In order to achieve CAP targets by 2030/2050 - it will most likely be the case that demand flexibility will be mandatory for LEUs. But it would be worth considering making it voluntary for a period. This should (i) allow LEUs time to make the arrangements/investments to become flexible (or more flexible) (ii) encourage more LEUs to enter into such agreements (iii) encourage LEUs to locate (re-locate) to areas of co-located Renewable Energy generation and/or invest in or build their own RE generation - either on site or somewhere else on grid - that can balance their own usage.
33	Should LEU connections in certain parts of the network be required to provide demand flexibility services? Is this measure justified?	Yes - this would be in areas of high constraint, if the LEU has no other option but to be in that area. Also this would depend on: - renewable integration - grid congestion - grid stability
34	If demand flexibility is voluntary for new LEUs, what type of incentives could be introduced to encourage the adoption of these services?	Financial incentives - grants, tax credits, feed in tariffs - can help developer of LEU to reduce cost of building. Also performance based payments - linked to demand flexibility achieved. Planning/Zoning Regulations - by implementing zoning regulations near renewable generation sites - could speed up the planning/permitting cycle - allowing LEU to complete construction in quicker time. Public Private Partnerships - can help improve infrastructure. Encourage LEUs to locate to near Renewable Energy sites. Access to Energy Markets - to sell/buy energy units Technical Support from SOs/Regulators etc. to assist with what can and can't be done - as the LEUs may lack expertise in this area. Reduce Tariffs/Rates for off peak hours - or rebates for any energy production (either on site or elsewhere)
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?	Exemptions for LEUs such as Data Centres- as they are not really in a position to be flexible - as generally they require the same level of power 24 hours a day. Unless they are generating their own energy on site. However DCs are becoming more important for even more critical services (e.g., hospitals, banking, AI etc.) - it is essential that they are guaranteed supply. The same would apply to hospitals. They could be assessed based on their importance to national interests - e.g. hospitals, pharma plants, data centres (which support hospitals, banking). Other factors to consider are: - grid stability - does flexibility pose - resource availability - cost benefit analysis - size of LEUs
36	Should timed/profiled connections be introduced? Please provide reasons and rationale for any views provided.	Yes - they can assist in managing energy demand, grid stability, increase the development of renewable energy sites - which all contribute to Ireland's CAP/Carbon goals. Load Management: by scheduling usage during low demand times (or times of high RE generation) - the demand curve can be flattened. Peak Demand Reduction: again - by shifting demand to times outside peak demand, it reduces overall demand at peak times - and spreads demand more evenly Grid Stability: by shifting demand and reducing demand at peak times - you are reducing grid constraint Renewable Energy Integration: by using RE at times of high production - reducing use of carbon based production Energy Efficiency: encouraging users to move to off peak/lower demand/RE generation times Demand Response Programs: customers switch demand based on availability
Energy Efficiency and District Heating		
37	Comments are invited from interested parties on the use of waste heat from LEU sites	The use of waste/recovered heat from LEUs such as data-centres, manufacturing plants - can play a key role in Ireland achieving its CAP/Carbon targets. Waste/Recovered heat can be used, via a pipe-network, to heat up commercial buildings, hotels, apartment blocks etc. - reducing the demand from other traditional sources (oil or gas). This is a relatively new industry in Ireland but has been ongoing in countries like Denmark and The Netherlands since the 1970's. Also, the UK are currently investing in this technology so there are ample opportunities for Ireland to learn from our neighbouring European countries. As Ireland currently has approx 70 data centres - there is an opportunity to harness the waste heat from these centres and use to provide heating to nearby commercial/residential/industrial customers.
38	Comments are invited on the use of waste heat from LEUs to feed district heating networks or other processes.	See above.
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.	They should be encouraged - by means of grants, tax credits etc - if LEUs can work with local authorities/developers to see how waste heat can be distributed back to the local community and help reduce the demand on carbon based heating. As the LEU is a large user of energy (be it renewable or carbon based) - anything to help reduce the carbon footprint can only be seen as a positive and make the LEU more of an environmental/sustainable member of the community.
Gas		
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?	If bio-methane gas could be used to replace/supplement natural gas - this could help in decarbonisation of LEUs by replacing domestic gas use with biomethane - allowing natural gas to be used for LEUs (where necessary). Or by using biomethane gas and storing on LEU sites - subject to the gas being suitable for power generation. Biomethane as a renewable gas is already established and available on the European market - so it is not a new industry. There is an opportunity here to leverage from our EU partners. According to Gas Networks Ireland - who recently carried out an RFI on Biomethane Gas production: - there is the potential for generating 14.8TWh of biomethane gas - based on RFI responses - Ireland's CAP has a target of 5.7 TWh of bio-methane gas by 2030 (currently Natural Gas production is approx. 57 TWh) If these targets can be achieved - then this can really help with the decarbonisation of LEUs that require gas as a power generation method (be it full or partial).
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.	Similar to Natural Gas - bio-methane should try not to be limited to being used for back up and/or flexibility purposes - as this helps reduce the reliance on gas and also helps to ensure the security of supply. Capacity factor would depend on the size of the LEU, availability of renewable energy, reliance on gas for energy production.
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.	It is the intention of Gas Networks Ireland to replace Natural Gas with Renewable Gas (biomethane) and eventually to replace this with Green Hydrogen in the future (albeit this will take some time) Refer to: https://www.gasnetworks.ie/business/renewable-gas/biomethane/report/index.xml
53	Comments are invited from interested parties on the renewable gas certification scheme.	Gas Networks Ireland now issue Guarantee of Origin certificates to producers of renewable gas for every megawatt hour of renewable gas injected into Ireland's national gas network, with the aim of providing certainty for customers as to the origin of renewable gas purchases and a mechanism for gas producers to monetise the renewable value of their product including biomethane. This is covered in Gas Network Ireland's Biomethane Energy Report September 2023 (https://www.gasnetworks.ie/business/renewable-gas/biomethane/report/index.xml)
44	Are there other options for decarbonisation of gas demand that should be considered?	- Integration of renewable energy generation to replace/supplement gas usage. - District Heating networks to reduce heating provided by gas/oil - Electric cooking (induction) to replace gas

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 nonfirm/interruptible connections can help alleviate emissions? Please provide reasons and rationale for any views provided	Some factors to consider: - flexible gas supply - LEUs can adjust gas usage if other sources energy available (e.g. renewable energy) - renewable/biomethan gas - demand/response programs - similar to energy demand/generatoin - financial incentives - for LEUs to reduce gas usage
46	How can demand flexibility services on the gas system provide a benefit for both system support and decarbonisation?	Assuming that Damand Flexibility on the gas system means that LEUs (or any user) can reduce their need for gas based energy production by (i) using their own renewable energy generated or (ii) importing renewable energy at times of high generation - then this would help to reduce the reliance on gas for energy production. This helps to support decarbonisatoin while also helping to ensure surety of gas supply for the gas powered generatoin stations in Ireland which in turn helps to secure the electricity generation/supply to all customers.
Assessment criteria		
47	Comments are invited from interested parties on maintaining optionality in what provisions an LEU must meet as part of its net zero emissions requirements.	
48	Comments are invited on how a new LEUs location may inform what criteria it may need to meet	
49	Comments are invited on how a transition period may inform an evolving net zero target and demand flexibility services that could be provided	
50	Respondents are welcome to suggest alternative approaches in how criteria is selected	
51	Respondents are welcome to suggest any additional approaches for LEUs to help meet net zero requirements not considered in sections above.	
Roles of other organisations		
52	Comments are invited from interested parties on the roles of other organisations in the different approaches considered in this paper	Regulators, planning authorities, revenue, government can work with LEUs to help generate incentives for either investigin or building renewable genetraion or locating close to renewable generation sites (to help reduce grid constraint) - incentives such as: - grants (government) - tax credits/breaks for generation of renewable energy or inverstment in same (revenue) - specific zoned development areas near RE sites for certain LEUs that will benefit LEU and wider community (this may help reduce planning period and ultimately cost of construction) (planning authority)
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.	Government and Regulatory Bodies: - monitoring & reporting - policy development - planning and development (Local Authorities under Government) Private Sector/Research Institutions - technology development LEU Operators - operations and management - monitoring and reporting - stakeholder and community engagement System/Grid Operators/Utility Companies - infrastructure planning and developmenmt - identifying needs - operations and management
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	Private Wires Legislation - by permitting Private Networks projects some of the wider issues/challenges can be alleviated such as: - increased access to renewable energy - achieving the countries CAP23 targets - reduction is use of Natural Gas and other fossil fuels for energy production - reduce curtailment and constraint issues - improved and more efficient grid infrastructure/network - reduced cost of energy for the end user - improved surety of supply for LEUs and smaller domestic users