An Coimisiún um Rialáil Fóntais
Commission for Regulation of Utilities

National Energy Demand Strategy

Consultation Paper

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CRU Strategic Plan 2022-24

Our Mission	Our Strategic Priorities
• Protecting the public interest in water, energy and energy safety.	• Ensure Security of Supply • Drive a Low Carbon Future • Empower and Protect Customers • Enable our People and Organisational Capacity
Our Vision	
• Safe, secure and sustainable supplies of energy and water, for the benefit of customer now and in the future	

Executive Summary

This consultation paper sets out proposals for the structure, content and implementation of the National Energy Demand Strategy[1] (NEDS) for Ireland and seeks input to inform decisions on more detailed design of proposals, next steps for implementation and the long-term design of the strategy. A decision paper is expected to follow in Spring 2024.

Climate action and the need for demand-side management

Ireland is committed to Climate Action, which is the most pressing long-term global challenge of our time and is a significant priority for the Government of Ireland. Ireland has committed to a 50% reduction in greenhouse gas (GHG) emissions by 2030 and becoming carbon neutral by 2050[2]. The Climate Action and Low Carbon Development (Amendment) Act 2021 placed a legally binding commitment on Ireland pertaining to climate change. As part of the Government's Climate Action Plan 2023 (CAP23), an action has been included to "Complete and Publish [an] Electricity Demand Side Strategy and Implementation Plan" (EL/23/24).

[1] Previously known as the Energy Demand Strategy (EDS). The NEDS requires a multifaceted approach by a broad range of organisations and consumers to develop and implement the strategy.
[2] Climate Action Plan 2023 (CAP23), Government of Ireland

There has historically been and continues to be a strong focus on increasing the generation of renewable electricity and supply of renewable energy. This new CAP23 action, to develop a demand-side strategy, calls for increased focus on the demand or consumption of energy. Demand-side management is the capability for active users of energy to react to signals and adjust their consumption, their charging and discharging of storage, and their own generation (where they have it) in a dynamic fashion.

A demand-side strategy focused on enabling flexibility and decarbonisation will be critical to accommodate: (1) large volumes of renewables (potentially requiring demand turn up to utilise low carbon electricity when it is abundant) and; (2) overall growth of electricity demand, for example from the growth of new data centre infrastructure, and the electrification of the heat and transport sectors (potentially requiring demand turn-down to reduce emissions and support system security).

A national approach, towards the core strategy objectives

The CRU is committed to the twin goals of decarbonisation and digitalisation as outlined in Government policy. Furthermore, we recognise Ireland as being a world leader in digital and ICT technologies, and in the R&D and manufacturing of pharmaceuticals, biotechnology and other sectors. This consultation, and the open call for evidence that preceded it, is targeted at identifying the measures by which Ireland can meet our legally binding carbon budgets, while facilitating further economic growth, acting in concert with industry's own clear ambition to decarbonise. However, this stage of the process requires all to move from long term ambition and statement of intent to more specific, actionable short and medium-term measures. The CRU is calling on all stakeholders, including consumers, industry, Government Departments, semi-state entities and agencies for continued engagement as we move to this next stage in the consultative process. This will support the identification of the means by which we can achieve the goal of decarbonising our economic growth, and the cross-government policy, regulatory and other cross-agency measures required to enable this necessary decarbonisation.

Developing and implementing a demand side strategy requires a national approach, with the input and actions of many different stakeholders required to ensure a successful outcome. Fundamentally, it requires all actors to be aligned on the shared vision of decarbonising all sectors of the economy and meeting the ambition as set out in the carbon budgets. The proposed core objectives of the strategy are to:

1) Set out measures which contribute to ensuring overall electricity and gas demand is consistent with Ireland's carbon sectoral emissions ceilings (SECs).

2) Deliver demand flexibility, particularly non-fossil fuel flexibility, and demand response initiatives, as outlined in CAP23, which sets a target of 15-20% demand side flexibility by 2025 and 20-30% by 2030.

3) Support the delivery of Ireland's transition to reach net zero emissions by 2050.

To realise this vision, actions will need to be taken across energy, enterprise, environmental, spatial and planning policy. Decisions will need to be taken across Government departments,

local authorities, enterprise development agencies and other public bodies. The CRU has been assigned the lead organisation to develop the national strategy and coordinate the relevant stakeholders. It is imperative that a coherent and collaborative approach to the NEDS is adopted across all relevant stakeholder groups. The strategy cannot be delivered by the CRU alone. The NEDS includes actions, proposals and recommendations that will need to be implemented by a broad spectrum of stakeholders. This includes actions such as the work which is ongoing in relation to the Planning and Development Bill, which is critical to the progress of energy projects in Ireland. Other examples include the work that the Department of the Environment, Climate and Communications (DECC) is doing in relation to developing policies for energy storage and biomethane. The realisation of these and many other actions, some of which are highlighted throughout this paper, are needed to contribute towards achieving a successful demand-side strategy.

Key recommended actions

There are a number of actions already being undertaken by various stakeholders which are critical to the success of the strategy. Furthermore, a number of additional proposed actions have been identified through the course of developing the strategy. Feedback is sought from readers on these and any other potential actions which may be required to develop and implement the strategy.

- Government policy seeks to enable the 'twin transitions' of digitalisation and decarbonisation of our economy and society. However, in the short term, the electrification of the heat and transport sectors means there is only limited capacity for further industrial electrification, including data centre development. The key state bodies, regulators and the electricity sector will work to upgrade infrastructure, connect more renewable energy generation, deliver grid infrastructure development, and ensure security of supply. This will allow for the longer-term foundations of a net-zero-ready economy and society that will be a competitive and attractive hub for decarbonised digital services, enabling the industries and services of the future. Further clarity from Government would be welcomed on the overall approach to the sectoral distribution of renewable electricity during the transition period, i.e. for the next 5-10 years, until such time as there is a sufficient increase in renewable energy projects and grid infrastructure development to provide low carbon demand needed across all sectors.

- It has become apparent, through feedback received and engagement over the course of developing the strategy, that further clarity is needed with regards to the framework for carbon budgets and the associated ambition. It is not transparent to the majority of energy users or entities how their operations/behaviour and associated emissions count towards the relevant SEC(s), and how overall management of the SECs are being coordinated. Clarity is required from Government as to whether emissions assessment of a development is to be carried out at planning stage, for example, and what assessment is required post-planning approval (e.g. how and by whom are emissions measured and monitored throughout the life of an asset/project) and if other state bodies are required to support the process. Consideration of the process should be taken both at individual asset/project level, so that energy users are aware of the

impact of their operations/behaviour on emissions and can modify accordingly in order to meet their emissions limits. It can also be considered at sectoral level, in order to assess and monitor the progress of cohorts against the relevant SEC.

- The CRU is carrying out its functions with a view to enabling decarbonisation of the energy system. However, the CRU's early engagement on specific initiatives, suggests that there remains a lack of clarity in relation to the extent to which each public body is expected to, or is empowered to, play a role. The CRU welcomes the call from the Climate Change Advisory Council (CCAC) for Government to "review and revise the legal mandate of relevant state agencies and public bodies to ensure these are consistent with delivering Climate Action Plan measures, as well as the legislated Carbon Budgets."

In future, it may be appropriate to capture these or other actions as part of CAP24 or subsequent iterations.

NEDS proposals and mechanisms for delivery

The NEDS proposes new initiatives and brings these together with existing activities and commitments, such as the National Smart Metering Programme and ESB Network's National Network Local Connections Programme. The development of the NEDS has been collaborative and contributions from a range of stakeholders will support delivery. The CRU initially published four papers for consultation and feedback as part of the EDS – Call for Evidence package in June 2023.

For Ireland to meet its carbon emissions targets, it is necessary for electricity demand to become more flexible, to optimise the use of renewable generation, charging/discharging of storage and behind-the-meter generation, and to minimise demand during times of high carbon intensity on the electricity grid. This will require new demand connections, especially Large Energy Users (LEUs), to invest in flexibility capability from the outset, and for all customers to increasingly shift their consumption away from peak-times and times of high-carbon intensity on the grid and towards times of high-renewable output. The CRU considers that there are three mechanisms for delivering demand flexibility, all of which will have a role in this strategy:

1. Implicit Flexibility. Responses to incentives, such as those offered through prices of tariffs, leading to "implicit" demand reduction or shifting.

2. Explicit Flexibility. Flexibility procurement, where contracts are agreed or products are designed and purchased to deliver a defined flexibility response.

3. Mandatory Requirements. Such as conditions associated with a connection – likely agreed at the point of connection or adopted as part of a modified connection agreement (e.g. expanding a site). Other mandatory requirements could include planning requirements or, for example, a mandatory smart charging standard for Electric Vehicles (EVs).

Focus Areas

The proposed strategy is organised around the following Focus Areas:

Area 1: Smart Services – Proposals will encourage greater flexibility among domestic customers and smaller business customers. Measures under this area include efforts to increase the availability and uptake of time of use and dynamic tariffs, and increase uptake of microgeneration.[3] The CRU also seeks to develop new licences for aggregation and demand response, and to develop a framework for new entities to enter the market and provide flexibility enabling services to customers. Area 1 is predominantly supporting delivery of implicit flexibility.

Area 2: Demand Flexibility and Response – Proposals will increase the potential for demand response from users, including LEUs and storage, at times when it is beneficial for the system and for energy users. This can reduce costs or carbon emissions for example, by providing efficient market signals and mechanisms. Area 2 is focused on delivering flexibility through responses to both incentives and flexibility procurement.

Area 3: New Demand Connections – The CRU seeks to provide a pathway for new LEU connections to the electricity and gas systems which ensures large demand connections are low to zero carbon, and/or bring significant flexibility with them when they connect. The CRU is currently developing a consultation paper building upon the 'Call for Evidence on Review of Large Energy Users Connection Policy' (CRU/202357) and reflecting information and feedback received. It is anticipated that this subsequent consultation on Review of Large Energy Users Connection Policy will be published early in 2024. This paper will further explore the challenges faced and set out different options available. Area 3 is focused on measures relating to mandatory requirements.

Measurement of demand flexibility

The measurement of demand flexibility against the target requires consideration of whether this is against peak or some other time period, and account is taken of the time duration of the shift in demand. Moreover, it is important to consider whether flexibility should be measured in terms of megawatt (MW) or megawatt-hours (MWh). The CRU has considered four options for the definition of demand flexibility with an emerging preference for use of *Volume Shift* (discussed further in Chapter 2) on the basis that it more accurately reflects the volume of demand that is being moved from one point in time to another. Using a definition measured in MWh will value sources of demand flexibility that can provide demand turn down or demand turn up for longer periods of time more highly, and aligns with the ambition of the EU electricity market design.

[3] See recently published (1st December 2023) decision paper on Incentivising the Uptake of Time of Use Tariffs (CRU/2023152)

Implementation

The proposal is for the NEDS strategy to be delivered in several phases. Phase 1 (to Q1 2024) defines the strategy and acts on elements which potentially have high impact and can be progressed in the short term. Phase 2 (2024 – 2026) is focused on increasing the uptake and diversity of flexibility enabling products and technologies, as well as developing the policies, markets, standards and frameworks to support longer term flexibility delivery and decarbonisation. Phase 3 (2026 – 2030) will deliver increasing volumes of flexibility through automation, aggregation and energy sharing while enabling scaling of competitive and liquid flexibility markets.

The CRU is of the view that Ireland's electricity system currently has limited demand flexibility, as per the proposed definition (and using assumptions described in Chapter 2 and the Annex). Considering the 2025 demand flexibility target, the CRU considers that the proposed initiatives, reforms, and proposals can contribute substantially towards the target. In the near term, the focus will be on explicit flexibility (Area 2) as the major channel for demand flexibility growth, particularly through flexibility procurement exercises initiated by system operators (SOs). As a framework is established to support a longer-term contribution from implicit flexibility (Area 1) and mandatory requirements (Area 3), these mechanisms are expected to contribute more substantially to the 2030 target.

Delivery of the NEDS will depend on cooperation and supporting action from a range of actors including development of relevant legislation by Government. Government will also provide the overarching direction for the twin transitions of decarbonisation and digitalisation, balancing economic growth objectives and determining prioritisation of decarbonisation and electrification across sectors such as heat and transport.

The CRU is responsible for leading the development of the NEDS and its coordination between the organisations delivering on the strategy's objectives. In line with CAP23[4], the collective actions of CRU, Government departments, SOs, State Agencies, wider industry, and customers are required to successfully deliver the NEDS and its objectives. Some of the key actions, where appropriate, may be captured in CAP24 or subsequent iterations. The active engagement, contributions, and actions across the range of stakeholders will be essential to the advancement of the NEDS, ensuring its success in achieving its overarching goals and embedding system flexibility.

Stakeholder Engagement

Given the national approach required to develop and implement the strategy, it is considered of utmost importance that a coherent and collaborative engagement process is adopted and continuously maintained across all relevant stakeholder groups. Stakeholders with particular interest in the NEDS include members of the public, SOs, the Single Electricity Market Operator (SEMO), generator and storage plant operators, suppliers, Government departments and agencies, business/industry interest groups, and commercial and domestic customers.

[4] DECC – Climate Action Plan 2023 Annex of Actions

Accordingly, the CRU commenced regular engagement with many different stakeholders since development of the NEDS was initiated in June 2023. A structured engagement plan was designed and put into practice, which included various groupings e.g. Policy Coordination Group (with DECC, the Department of Enterprise, Trade and Employment (DETE), CRU), Working Group (with DECC, DETE, CRU, ESB Networks (ESBN), Eirgrid, Gas Networks Ireland (GNI), IDA Ireland) System Operators Group (CRU with ESBN, Eirgrid, GNI) and Industry Representative Bodies, with set frequencies for recurring meetings. In addition, the CRU has also frequently met bilaterally with various key stakeholders, for example with individual SOs throughout the project to date, or where a particular request to do so has been received from a stakeholder. These meetings have taken place to promote participation and better understand the complex and varied but highly relevant perspectives that stakeholders can have on energy demand in an inclusive, fair and equitable manner. Regular engagement between those entities leading key actions (such as DECC, CRU, SOs) and other stakeholders will continue, in addition to planned stakeholder workshops, throughout the development and implementation of this strategy.

Several market changes to promote flexibility will need to be progressed through the Single Electricity Market Committee (SEMC) for implementation and will require improvements in market and dispatch systems, such as enabling greater participation in Demand Side Units (DSUs) in the Single Electricity Market (SEM), facilitating industrial heat flexibility, and energy arbitrage from storage providers. Previously in the EDS Call for Evidence, the CRU had indicated that such changes would not be in scope of the NEDS in the short term. With further consideration, including that of stakeholder feedback, the CRU will assess how best to include these changes within the scope of the strategy.

Next steps

To support development of the NEDS, the CRU is seeking input from all relevant parties on the topics of demand-side flexibility and net zero growth in demand. Accordingly, the CRU invites all stakeholder groups to submit their views, observations, and suggestions on the key NEDS elements, particularly to those questions that have been identified throughout this paper as requiring consideration. The essence of the questions, and this consultation paper, is to seek opinion on what are the best signals for energy users to receive in order to meet the objectives of the strategy.

The CRU will also continue to engage with stakeholders through workshops, discussion and continuation of the NEDS steering groups. Through this engagement process, the CRU is striving to be inclusive, fair and equitable. Responses received to this consultation paper will help the CRU, along with the organisations on the NEDS policy coordination and working groups, to identify relevant issues that need to be considered and addressed within the NEDS. Following the end of the consultation period on Friday 16th February 2024, the CRU will review the responses received from stakeholders and will work towards publishing a decision paper in spring 2024.

Public/Customer Impact Statement

The Government's Climate Action Plan 2023 (CAP23) sets out the roadmap for decarbonising Ireland's energy supply and details a range of commitments to enable a low-carbon economy, including targets to increase the flexibility of energy demand. The CRU launched the National Energy Demand Strategy (NEDS) in response to CAP23 to identify and coordinate the actions necessary across the energy system to reduce the carbon intensity of energy demand in Ireland. The ambition of the NEDS is to do so by driving collaboration between many different stakeholders, primarily through the development of more flexible energy demand. If all electricity customers shift their consumption to times when there is plenty of electricity being generated by renewable generation there will be less carbon emissions even as demand for energy increases. Therefore, demand flexibility will enable all energy customers with the capability to optimise their use of renewable energy whilst also reducing demand during times of high-carbon intensity on the electricity system.

This will provide a pathway to reducing greenhouse gas (GHG) emissions which Ireland is required to do in order to comply with legally binding limits that have been set out in the carbon SECs. These limits set a legally binding target of a reduction in carbon emissions of 51% by 2030 (compared to 2018 levels) and specify the maximum amount of greenhouse gas emissions that are permitted for each sector of the Irish economy. The NEDS is committed to facilitating a more reliable, sustainable and efficient energy system in line with the SEC limits for the electricity sector while also minimising costs for energy customers.

The actions required to meet the SEC for electricity, including increased demand flexibility, will require a significant transformation to Irish society and its economy. It will require a major change to how the energy system operates, and in how all customers organise their energy usage from domestic households to large energy users. Ireland's energy demand is forecasted to grow significantly in the next decade, in addition to the amount of renewable energy that can be produced. Onshore wind power is currently the main source of renewable energy generated in Ireland, with solar and offshore wind set to play an increasing role in the future. Wind and solar are intermittent and variable sources of generation because the amount of wind and light constantly changes which in turn means that renewable energy generated from these sources fluctuates depending on varying environmental factors. Ensuring Ireland's renewable energy generation can meet the growing energy demand calls for greater flexibility in energy consumption. The ability to adjust our consumption patterns in response to fluctuations in renewable energy output is crucial to decarbonising Ireland's electricity system. This change in consumption will be required by all energy users but large energy users are key to delivering flexibility, particularly non-fossil fuel flexibility, in the near term.

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Glossary of Terms and Abbreviations

Abbreviation or Term	Definition or Meaning
1999 ERA Act	Electricity Regulation Act, 1999 (as amended)
2021 Climate Act	Climate Action and Low Carbon Development (Amendment) Act, 2021
Paris Agreement	A legally binding international treaty on climate change
ACER	European Union Agency for the Cooperation of Energy Regulators
ADR	Alternative Dispute Resolution
CAP23	Climate Action Plan 2023
CCAC	Climate Change Advisory Council
CCS	Combined Charging System
CCUS	Carbon Capture, Use and Storage
CEP	Clean Energy Package
CRM	Capacity Renumeration Mechanism
CRU	Commission for Regulation of Utilities
CVR	Conservation Voltage Reduction
DAC	Smart Meter Data Access Code
DECC	Department of the Environment, Climate & Communications
DETE	Department of Enterprise, Trade & Employment
DS	Demand Side
DSS	Decision Support Scheme
DSUs	Demand Side Units
DS3	Delivering a Secure, Sustainable Electricity System programme
DUoS	Distribution Use of System
DSO	Distribution System Operator
ECP	Enduring Connection Policy
ECR	Energy Communities Repository
EDS	Energy Demand Strategy, renamed NEDS
Electricity system	Transmission and distribution electricity system
ENTSO-E	European Network of Transmission System Operators for Electricity

EPA	Environmental Protection Agency
ESBN	ESB Networks
EU	European Union
EV	Electric Vehicle
GCS	EirGrid's All-Island Generation Capacity Statement 2022 - 2031
GHG	Greenhouse Gas
GNI	Gas Networks Ireland
GO	Guarantee of Origin
GW	Gigawatt
HEMS	Home Energy Management Systems
I-SEM	Integrated Single Electricity Market
JSOP	Joint System Operator Programme
kV	Kilovolt
LDES	Long Duration Energy Storage
LEUs	Large Energy Users
LOLE	EirGrid's Winter Outlook Loss of Load Expectation
MPRN	Meter Point Reference Number
MRSO	Meter Registration System Operator
Mt CO_2 eq	Million Tonnes Carbon Dioxide Equivalent
MW	Megawatt
MWh	Megawatt Hour
NECP	National Energy & Climate Plan
NEDS	National Energy Demand Strategy, previously EDS
NNLC	National Network Local Connection
NSMP	National Smart Metering Programme
PR5	Price Review 5 (2020-2025)
PR6	Price Review 6 (2026-2030)
PV	Photovoltaic
RECAH	Rural Energy Community Advisory Hub
ROCOF	Rate of change of frequency in the electricity system
SEAI	Sustainable Energy Authority of Ireland
SECs	Sectoral Emissions Ceilings

SEM	Single Electricity Market
SEMC	Single Electricity Market Committee
SEMO	Single Electricity Market Operator
SNSP	System Non-Synchronous Penetration, electricity generated from non-synchronous sources, such as wind and solar power, and imported from HVDC interconnectors relative to the total electricity demand.
SO(s)	System Operators (being the Electricity Transmission System Operator, EirGrid plc, the Distribution System Operator, ESB Networks DAC, and the Gas TSO and DSO, Gas Networks Ireland DAC)
SONI	System Operator for Northern Ireland
SoS	Security of Supply
ToE	Time of Export
ToU	Time of Use
TSO	Transmission System Operator
TWh	Terawatt Hour
V2G	Vehicle-to-Grid
V2H	Vehicle-to-House
XLEU	Extra Large Energy User
ZEVI	Zero Emissions Vehicles Ireland

1. Introduction

This chapter sets out the context for the National Energy Demand Strategy (NEDS). This is provided with respect to the initiation of the strategy, the legal and regulatory context, and also with regards to the latest relevant information from the European Commission.

1.1 CAP23: The Need For A Demand Strategy

The NEDS is being developed to meet both the specific ambition set out in the Government's Climate Action Plan 2023 (CAP23) with reference to flexible electricity demand and to support wider decarbonisation and security of supply objectives. The measures proposed in this document reflect the pace and scale required to facilitate system demand flexibility, particularly non-fossil fuel flexibility, in Ireland. The CRU is eager to understand stakeholders' views on the potential options for the strategy provided throughout this consultation.

1.2 Balancing Energy Demand with Ireland's Climate Ambition

The Climate Action and Low Carbon Development (Amendment) Act, 2021 placed a legally binding commitment on Ireland pertaining to climate change and the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of 2050. It commits Ireland to targets for reducing GHG emissions by 2030 and 2050 and provides the associated governance framework. Specifically, the electricity sector has a ceiling of 40 $MtCO_2eq$. for the first budgeting period (2021-2025), equating to an average of 8 $MtCO_2eq$. per annum, and a ceiling of 20 $MtCO_2eq$ for the second budgeting period (2026-2030). Further information has been provided in Annex I, and in the previous paper, the Call for Evidence – Energy Demand Strategy [CRU/202356]. Crucially, Ireland is not on track to meet the 51% emissions reduction target (by 2030 compared to 2018) with further measures still needing to be identified and implemented to achieve this goal.[5] Both the carbon budgets and the sectoral emissions ceilings are projected to be exceeded by a significant margin.

A significant challenge for Ireland is the increasing and immediate demand for energy, while trying to achieve the climate ambition set out in the carbon budgets. Demand has grown in the latest year on year comparisons[6] and is forecast to continue to increase across the range of scenarios considered in EirGrid's Generation Capacity Statement.[7] Additionally, electricity is expected to play an important role in the decarbonisation of many sectors through

[5] Ireland's Greenhouse Gas Emissions Projections 2022-2040, EPA, June 2023 EPA-GHG-Projections-2022-2040_Finalv2.pdf

[6] Total energy demand in Ireland rose by 4.7% in 2022, compared to 2021. Energy in Ireland 2023 Report, SEAI, December 2023 Energy-in-Ireland-2023.pdf (seai.ie)

[7] Ireland Capacity Outlook 2022-2031, EirGrid_SONI_Ireland_Capacity_Outlook_2022-2031.pdf

electrification, including transport, heating, and industry. Electrification of these sectors can provide a formidable method for replacing fossil fuels and reducing emissions. In the long term, when there is likely to be sufficient renewable energy generation and appropriate infrastructure in place, increased demand fromy energy consumers across these sectors can be provided for while adhering to the carbon budgets. However, at present, and in the short to medium term, there are limitations to amount of energy that can be provided while simultaneously meeting the carbon budgets. This is due to the emissions associated with the current fuel mix[8]. This is expected to change over time as more renewable energy projects are developed. Ultimately, this will allow for fulfilment of the principles as set out by the Government[9] with the intention of ensuring that economic growth, including increasing digital infrastructure, can be accommodated and contribute towards meeting our climate and policy ambition.

Analysis[10] by MaREI concluded that to meet the SECs, the power sector must rapidly and immediately deploy renewable electricity and manage electricity demand growth. However, most pertinently, it also demonstrated that a quadrupling of renewable electricity generation would be required within the decade to meet the targets.

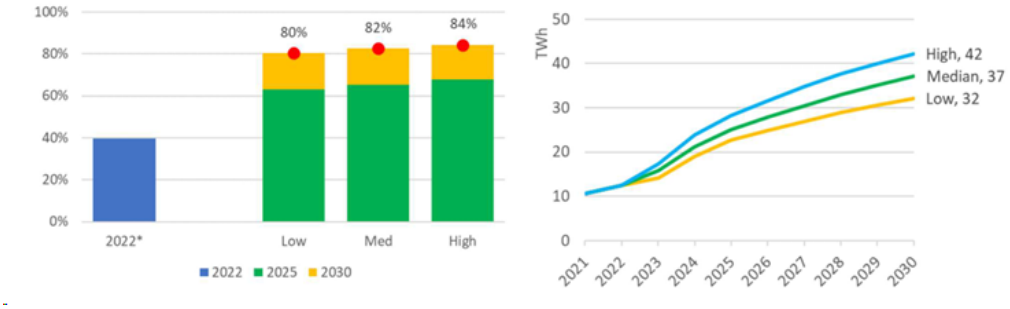


Figure 1 : RE share and total renewable generation required to meet Eirgrid GCS 2022 "low", "median" and "high" demand scenario forecasts while remaining underneath sectoral carbon budget ceilings for the first two carbon budget periods to 2030[11]

The NEDS is being developed with a view to increasing demand flexibility and the overarching objective of aligning the gas and electricity demand profiles with the carbon budgets. However, during the transition period in the short-medium term (5-10 years), the rate of deployment of renewable energy does not allow for the simultaneous supply of the overall energy demand desired, whilst also meeting the carbon budget requirements. As such, there is a lack of clarity in relation to the sectoral distribution of renewable electricity during this transition period. Primarily directing electrification efforts to the heat and transport sectors may contribute most

[8] 56% of Ireland's total carbon emissions are energy related combined with our high dependence on imported fossil fuels to satisfy our domestic energy needs (in 2022, 81.6% of Irelands energy was imported and 85.8% of Ireland's primary energy demand came from fossil fuels). Energy in Ireland Report, SEAI, December 2023.
[9] Government of Ireland Statement on the Role of Data Centres in Ireland's Enterprise Strategy, July 2022
[10] Prospects for Carbon Budgets 1 & 2, Prof. Hannah Daly, University College Cork, October 2022
[11] ibid. See reference for relevant details & assumptions. This assumes natural gas is the only fossil fuel in the generation mix from 2023, and the carbon intensity of gas-fired generation is 404 gCO2/kWh. (MaREI)

substantially towards an accelerated reduction of emissions. Alternatively, providing pathways and proposals for industry to electrify may allow for increased economic growth and enhanced financing and innovation of the technologies required to allow for the transition, but may also result in a delay to achieving alignment with carbon budgets.

The CRU notes the CCAC's recommendation that planning permission for all data centres should require a CPPA for renewable electricity and note that this requirement could be more appropriate as a planning condition for the facility rather than as a regulatory condition. It is also noted that the recent grant of planning by Fingal County Council for a data centre in Blanchardstown Mulhuddart not only requires a CPPA to be in place, and attributable to the Data Centre, but also requires that: "*The amount of electricity generated by the new renewable energy projects shall be equal to or greater than the electricity requirements of the data centres in operation at any given time*".

The CRU also notes the recent publication of the recast Energy Efficiency Directive[12], which more than doubles the annual energy savings obligation (Article 8) by 2028, making it binding for EU countries to collectively ensure an additional 11.7% reduction in energy consumption by 2030, compared to the 2020 reference scenario projections. Alongside Ireland's carbon budgets, this will likely increase the need for Ireland to examine the scenarios for our continued economic growth, to consider how we ensure that economic growth is decoupled from carbon and energy intensity, and to reflect on which sectors will share the burden and opportunities arising from these policy and legal obligations.

Further clarity from Government would be welcomed on the overall approach to the sectoral distribution of renewable electricity during this transition period.

1.3 Legal Context

The legal framework within which the CRU has regard to when preparing this consultation is as follows:

- The CRU's functions and duties are set out principally in section 9 of the Electricity Regulation Act 1999, as amended (the 1999 Act). Sections 9(4) and 9(5) of the 1999 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 consultation paper are contained at section 9(4)(a)(ii), 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 34 of the 1999 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

[12] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL_2023_231_R_0001&qid=1695186598766

systems, including directions for the range of purposes set out in section 34(2), and the SOs shall comply with such directions.

- Section 9(4)(a)(ix) of the 1999 Act provides that the CRU must have regard to the need to promote flexibility in the internal market for electricity.
- Section 6C of the Climate Action and Low Carbon Development Act 2015, as amended, (the 2015 Act) provides for the preparation of Sectoral Emissions Ceilings which set out the maximum amount of greenhouse gas emissions that are permitted in different sectors of the Irish economy.
- Under the provisions of section 15 of the 2015 Act, the CRU and SOs are required to perform their functions in a manner consistent with the furtherance of the national climate objective and with the most recent approved climate action plan (i.e., CAP23).
- Under CAP23, there is a commitment to deliver demand flexibility and demand response initiatives in line with set targets of 15-20% demand side flexibility by 2025 and 20-30% by 2030.
- The CRU has been assigned by CAP23 as the lead organisation to "Complete and Publish [an] Electricity Demand Side Strategy and Implementation Plan" (EL/23/24), with input from key stakeholders. CAP24 will set out actions that must be taken in order to achieve legally binding 2030 targets, prepare for climate neutrality no later than 2050, and make Ireland a leader in responding to climate change.
- 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.
- Statutory instruments transposing Directive 2019/944 into Irish law provide the CRU with extensive functions to provide smart meters and smart services for consumers and to promote active customers and energy communities.
- The principle of equal treatment arising under European Union 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 Union 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.

1.4 National Policy & Regulatory Landscape

As detailed in the EDS Call for Evidence, the CRU intends to publish a demand side strategy and implementation plan in line with CAP23. CAP23 also details various targets relevant to the energy sector that will affect the broader environment for the NEDS. For example, it sets out a target for 30% of the private car fleet to be electric by 2030, approximately 680,000 heat pumps to be installed, and for manufacturing processes and wider industry to see increasing electrification. These developments will significantly increase the demand for electricity in Ireland and the system will need to evolve to meet the changing needs of both customers and businesses. As energy demand is forecasted to increase by 37%[13] by 2031, it is important that demand flexibility delivers at scale to support the stability of the system and to accommodate the build out of renewable energy in Ireland with a renewable generation capacity of at least 14GW targeted by 2031. Ensuring that the NEDS is developed in a manner which is cognisant of the broader transformation of the sector and policy environment will improve its design and implementation. The CRU is also delivering several workstreams that are relevant to the NEDS but are not within scope of this project; for example, the delivery of an offshore renewable regulatory regime, the Future Arrangements for System Services, and review of the Capacity Remuneration Mechanism (CRM).

As an EU Member State, Ireland is required to prepare a National Energy and Climate Plan (NECP) in accordance with Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action. The NECP sets out the nation's roadmap over a 10-year period and is assessed by the European Commission to track Member States' progress towards climate and energy targets. The Government submitted its NECP[14] in 2019 which detailed Ireland's policy objectives and proposed measures to develop Ireland's internal energy market, including the further development of flexibility markets open to a range of flexibility sources. From 2023, and every two years following, each Member State will provide the European Commission with a NECP progress report. Ireland submitted its first updated NECP this year and the expansion of demand flexibility enabled by the NEDS will be a key component of future progress.

The Single Electricity Market Committee (SEMC) is the decision-making authority for the Single Electricity Market (SEM), the wholesale electricity market on the island of Ireland. The SEM Committee's plans and roadmap, including for example the CRM and DS3 programme, will be highly relevant to the advancement of the NEDS.

There are a range of additional policies and initiatives which are relevant to the progress of the NEDS. Some of these are summarised in the following table.

[13] EirGrid_SONI_Ireland_Capacity_Outlook_2022-2031 – median scenario, assuming no new data centres beyond those contracted. This is on the basis that further data centres would bring equivalent generating capacity to the system.

[14] Ireland's National energy and climate plans

National	Energy Security Package (DECC)
	Biomethane Strategy (Dept. Agriculture)
	National Hydrogen Strategy (DECC)
	Ireland's Enterprise Strategy & The Role of Data Centres (DETE)
	Private Wires Consultation (DECC)
	The National Residential Retrofit Plan (DECC)
	National Smart Metering Programme (ESBN)
	Renewable Electricity Support Schemes (DECC)
	Smart Energy Services Working Group (DECC)
	Business & Public Sector, Home & Community Energy Grants (SEAI)
International	EU Energy Efficiency Directive
	European Green Deal
	EU Renewable Energy Directives
	United Nations Sustainable Development Goals
	United Nations Paris Agreement

Table 1 - Overview of national policy and international initiatives relevant to the NEDS

1.5 EU (ACER) Demand Response Framework Guideline

Demand-side participation and the development of flexibility in energy markets is gaining prominence in an international context. In December 2022, the European Union Agency for the Cooperation of Energy Regulators (ACER) published a Framework Guideline on Demand Response[15] which details an approach for the development of demand response markets in the European Union. The Framework Guideline prescribes key principles and requirements for the design and implementation of demand response markets in EU Member States. It is binding on the European Network of Transmission System Operators for Electricity (ENTSO-E) and the EU DSO Entity as they develop the Network Code on Demand Response. The framework refers to rules regarding aggregation, energy storage, and demand curtailment and emphasises the importance of developing markets that are technology neutral. The framework also details guidelines on the procurement processes, transmission system operator (TSO) and distribution system operator (DSO) coordination, and products to support the establishment of demand side flexibility markets. The Network Code on Demand Response, which is currently being drafted in line with the Framework Guideline, will be central to facilitating market-based procurement and enabling market access to a wider range of participants in Ireland. The growth of demand response and flexibility markets elsewhere in the EU is relevant to the expansion of flexibility in Ireland, it is important to understand how

[15] ACER: Framework Guidance on Demand Response

lessons and progress internationally may apply to the existing and future flexibility markets in Ireland.

1.6 EU: Flexibility Markets & Member State Experience

Flexibility markets are growing across Europe. Certain markets are more established such as those in France and Germany, whereas other markets, such as those in Cyprus, Slovakia, Romania, and Greece, are growing with their ancillary services markets now open to demand side flexibility. The main driver of demand side flexibility varies between countries; Italy, Austria, and Switzerland have more accessible regulation for local energy systems in comparison to the Netherlands, France, and Great Britain where there are established commercial distribution level services. Accessible regulation is key to enabling demand side flexibility and its valuable role in energy systems. The progress of relevant regulation, policy, and legislation will prove fundamental in unlocking demand side flexibility in energy markets across Europe.

Some instructive examples of how flexibility is being delivered across other European countries are provided below:

- In the Netherlands, GOPACS was established in 2016 and is a cooperation between the Dutch TSO, TenneT, and the regional DSOs to manage congestion on the electricity system. GOPACS enables large and small market participants to monetise their available flexibility to alleviate system stress by bidding in their demand reduction or flexible generation.

- In France, the largest DSO, ENEDIS, has implemented market-based mechanisms to utilise demand flexibility. ENEDIS accepts tenders from producers, battery storage, electric vehicles, and demand response participants, with active or reactive power for voltage congestions. ENEDIS provides a demand response service called NEBEF (Notification of Exchanges of Effacing Blocks), which allows approved participants to sell demand response on the market on a day-ahead or on an intraday basis.

- In Estonia, Eesti Energia's flexibility energy management service enables market participants to benefit from demand response and is open to a range of participants from industrial consumers, electric transport hubs, to battery storage. Through connection to Eesti Energia's virtual power plant platform, participants can receive automated signals to alter their consumption and receive financial compensation for doing so.

- Elia, the Belgian TSO, offers flexible demand management products to support frequency reserve and balancing services on the grid including reserved and non-reserved contracted volumes with market participants.

- In Italy, the largest DSO E-Distribuzione has initiated its first local flexibility market pilot to evaluate the best way to procure local ancillary services in and set appropriate renumeration mechanisms for participants.

As the NEDS progresses, the CRU will monitor developments internationally to ensure that Ireland can adapt its approach based on learnings from other countries developing market-mechanisms, policy, and regulation to enable demand flexibility, particularly non-fossil flexibility, and decarbonisation.

1.7 Annex

Alongside this NEDS Consultation Paper, a supporting Annex document [CRU2023148a] has been published. This provides additional context and detail for several of the topics discussed and is referenced in several sections of the document.

1.8 References

The following list of documents and references contain further information on key topics mentioned throughout this paper.

- Electricity Regulation Act, 1999 (1999 Act)
- Climate Action and Low Carbon Development (Amendment) Act, 2021 (2021 Climate Act)
- Climate Action Plan 2023 (Climate Action Plan 2023)
- CRU Strategic Plan 2022-24 (CRU Strategic Plan 2022-24)

2. Strategy Overview

This chapter provides details on various aspects of the proposed strategy. First, it discusses work carried out to date, then a summary of responses received to the EDS Call for Evidence is provided. Thereafter, the vision, objectives and focus Areas of the NEDS are detailed, followed by a section outlining the methods to be employed for enabling demand management. It then describes the role of the NEDS Areas and the approaches for delivering flexibility.

2.1 NEDS – Work Carried Out to Date

The CRU published four papers for consultation and feedback as part of the EDS – Call for Evidence package on 21st June 2023[16]**:**

- Call for Evidence – Energy Demand Strategy [CRU/202356]
- ESBN Scenarios for 15-20% Flexible System Demand - National Networks, Local Connections Programme Paper [CRU/202358a]
- Call for Evidence – Review of Large Energy Users Connection Policy [CRU/202357]
- Consultation Paper – Incentivising the Uptake of Time of Use Tariffs [CRU/202358]

The CRU subsequently facilitated a four-week extension to the response deadline until the 30th of August 2023, in order to accommodate a number of requests received by the CRU from stakeholders to allow for additional time to submit a response.

The publications that accompanied the EDS Call for Evidence were based on particular focus Areas which are described in further detail later in this chapter. Additionally, a summary of responses to the Call for Evidence EDS paper is provided in the next section.

Subsequent publications associated with workstreams under these Areas will continue to provide critical input into the NEDS and will play a fundamental role in determining how the project progresses.

2.2 Call for Evidence EDS Paper - Response Summary

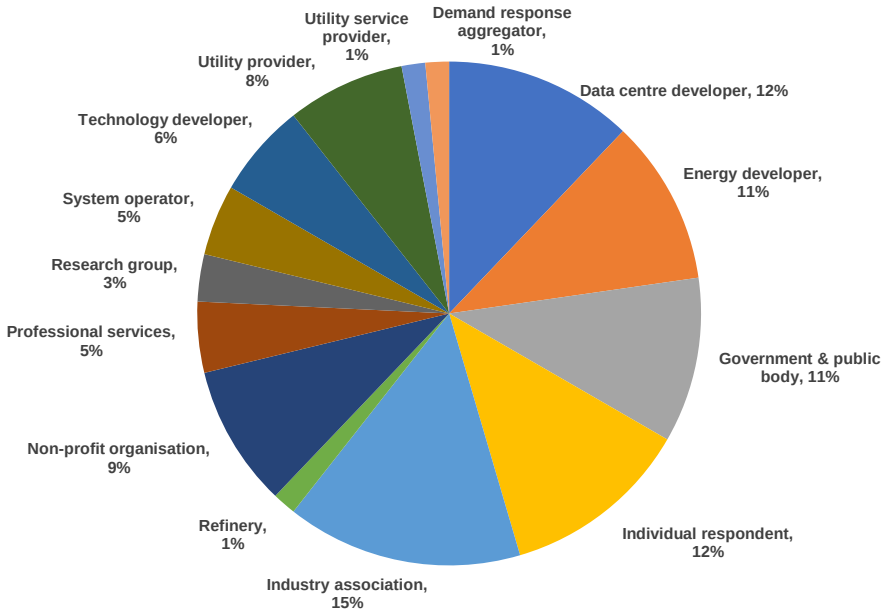
In October 2023, the CRU published the responses received across the four papers within the EDS Call for Evidence package[17] that had been published in June 2023. Some responses were not included due to them containing commercially sensitive information or for confidentiality reasons. A summary of the responses received to the EDS Call for Evidence

[16] Energy Demand Strategy Call for Evidence Paper
[17] Collated Responses – Energy Demand Strategy Papers

Paper, including commentary, proposed responses to the input received and suggestions from respondents is provided in Annex II.

The EDS Call for Evidence package received 98 responses across the four publications, 24 were in direct response to the EDS Call for Evidence and 66 responses were deemed relevant to the EDS Call for Evidence specifically. The feedback and input from stakeholders have contributed significantly to the development of the NEDS across the approach, proposals, definition of flexibility, and plans for delivery.

Figure 2 - Percentage of respondents by category



The following is a summary of some key themes that emerged from responses received.

- The original proposed NEDS scope was too narrow; for example, many respondents suggested the CRU should reconsider including Demand Side Units (DSUs) participating in the SEM. The CRU has considered this further, it is now proposed to expand the scope of Area 2, described below, to account for proposals that may take effect across the SEM, if implemented, such as broadening participation in DSUs, particularly by non-fossil fuel flexibility.

- Respondents had differing views on the pace of the project. The majority of respondents suggested that the NEDS should adopt a slower approach and in some cases deprioritise the short term (2025) targets, in addition to consideration for providing a wide range of pathways to a low carbon future, especially for those whose operations were particularly challenging to providing flexibility. It was argued that the strategy being proposed was too radical, in the short term to medium term for the timescale being proposed. A limited number of respondents suggested accelerating the project, recognising the pace and scale of changes required to ensure Government targets can be met.

- Respondents noted the need for greater transparency of how the Government, SOs, and other relevant parties are collaborating to advance the NEDS and the ambitions set out in the Call for Evidence. Respondents emphasised the need for evidence as to how SOs were collaborating in the development of flexibility markets to minimise any overlapping and potentially contradictory market signals.

- Respondents proposed that the project should not exclude or overlook the value of flexibility that could be provided from all LEUs by focusing on data centres. Respondents highlighted that the NEDS should account for the value of flexibility embedded in certain sectors such as heat and transport as potential mechanisms for unlocking system flexibility.

- A limited number of new or significantly material proposals were offered by respondents, relative to the scale of the challenge and the relevant targets. Respondents noted the importance of, for example, network charging and tariffs in incentivising demand flexibility and consequently the CRU has broadened the scope of Area 2 to include this.

- Another key theme was a call for greater clarity on the specific benefit of flexibility to the system and the need to develop efficient market signals to incentivise appropriate investment. The CRU has been collaborating with ESBN to support the development of flexibility markets and procurement that can provide the market with a view of the scale, location and value of services required. Similarly, the CRU has been engaging with EirGrid on its Demand Response Strategy to progress and align the development of flexibility markets at the transmission and distribution level.

2.3 Strategy Vision & Objectives

The strategy proposes a range of initiatives across many areas which could contribute towards a national approach to meeting Ireland's climate ambitions whilst enabling security of supply and minimising costs for consumers. The NEDS was initiated by the CRU, in collaboration with Government departments, SO's and other entities, to provide a framework within which to progress the range of actions required to decarbonise economic growth.

The proposed strategy objectives are to:

1) Set out measures which contribute to ensuring overall electricity and gas demand is consistent with Ireland's carbon SECs.

2) Deliver demand flexibility, particularly non-fossil fuel flexibility, and demand response initiatives, as outlined in CAP23, which sets a target of 15-20% demand side flexibility by 2025 and 20-30% by 2030.

3) Support the delivery of Ireland's transition to reach net zero emissions by 2050.

CAP23 included an action item for the CRU to deliver a demand side strategy and set demand flexibility targets for 15-20% of electricity system demand to be flexible by 2025, increasing to

20-30% by 2030. The CRU recognises that a demand strategy focused on enabling flexibility and decarbonisation is going to be critical to accommodate large volumes of both renewables (requiring upwards demand response to utilise low carbon electricity when it is abundant) and growth of electricity demand, for example from new data centres, electrified heating and transport (requiring downwards demand response to reduce emissions and support system security).

Demand-side flexibility is the capability for active users of energy to react to external signals and adjust their consumption, charging/discharging of storage, and own generation (where they have it) in a dynamic fashion. To align with the principles described, the CRU has proposed to use a definition of demand flexibility based on the proportion of demand that can be shifted (MWh), including storage and behind-the-meter generation; the definition of flexibility is discussed further in section 2.9.

Collaboration, action, and engagement from all parties involved in the NEDS will be crucial to achieving its objectives. Relevant government policies, SO initiatives, retail market offerings, and other industry activities will shape the pathway for development and implementation of the NEDS. The advancement and success of the NEDS is dependent on a fast pace and high level of engagement from all parties to ensure that efforts are reflective of requirements and impacts are positively reinforcing. Alignment between actors across initiatives within the NEDS will provide a stronger signal to the market, encouraging greater participation and incentivisation of flexibility. Additionally, with regards to the life cycle development of an energy project, providing early signals to industry by the relevant entity (e.g. Government department, SO, statutory authority, or other relevant entity), will help support the pace needed by the strategy. For example, providing an early decision with regards the proposed location / co-location of an energy project which provides demand flexibility will contribute significantly to the success of the NEDS. The table below illustrates a selection of significant responsibilities of key actors required for the successful delivery of the NEDS. Some actions and recommendations are in progress and others have been identified through Phase 1 of the NEDS and should be addressed in future.

Body	**Illustration of responsibility to deliver**
Government Departments	• Expansion of renewable generation through appropriate policy support • Economic strategy to deliver and balance twin goals of decarbonisation and digitalisation • A fit for purpose planning process to deliver required rate of utility infrastructure roll out • Establish the role for long duration storage and support mechanisms • Clarify role for biomethane and other roles for alternative fuels/technologies that can deliver flexibility

State Agencies	• Monitor and report on sectoral emissions • Financial support and guidance for low carbon technology deployment with high flexibility potential
ESB Networks	• Delivery of new products and services to incentivise flexible demand for congestion management, connections, and carbon abatement purposes, through the National Network Local Connections Programme • Implement broader Multi-Year Plan and Blueprint commitments • Develop and deliver new flexibility products to the market including storage and industrial heat focussed products • Identify constraints at an early stage to provide optionality for cost effective flexibility solutions • Implement TSO-DSO Operating Model • Work with EirGrid on baselining and metering solutions to measure explicit demand response dispatched through the SEM
EirGrid	• Improve efficiency of system dispatch and facilitate greater demand flexibility in the energy markets, including the Balancing Market • Resolve revenue stacking challenges for flexible technologies so that system value case aligns with business case • Certify emissions for system users and report emissions for EirGrid's own dispatch decisions/actions • Implement TSO-DSO Operating Model • Work with ESBN on baselining and metering solutions to measure explicit demand response dispatched through the SEM
Gas Networks Ireland	• Develop scenarios for the future role of the gas network • Support planning for the future role of the gas network and pathway for implementation • Delivery of new products and services to incentivise flexible demand

Single Electricity Market Committee	• Consider proposals to promote flexibility that are within the remit of the SEMC, such as enabling greater participation in Demand Side Units (DSUs) in the SEM
Suppliers and other market participants	• Deliver and enable uptake of dynamic and ToU tariffs • Develop and drive awareness and consumer uptake of products and initiatives that facilitate and encourage customers increasing their demand flexibility • Develop products to support customers' adoption of low carbon flexible technologies and their integration with energy management systems and suppliers' market activities

Table 2 – Selection of significant responsibilities of key actors impacting the NEDS

2.4 Guiding Principles

The strategy is designed with consideration for five overarching principles for assessing initiatives:

1. Initiatives should enable the reduction of the carbon intensity of energy consumed, and/or the reduction of peak demand, and should reward customers for participation
2. Initiatives should reduce the dispatch down of renewable generation at a local and/or system-wide level in Ireland to the overall benefit of customers
3. Initiatives should support market participation and new connections by alleviating constraints on the network
4. Initiatives should achieve efficient long-term costs for customers associated with upgrading, expanding and operating the electricity system
5. Initiatives should support security of supply for customers

Proposals in this strategy have been considered so that they generally promote at least one of the five principles, whilst not unduly contravening any of the others. These principles will also inform our approach for future proposals. It should be noted that the energy transition will not be costless and some of the initiatives will add to customer charges in the near term. However, the CRU considers that there are significant long-term benefits for customers in decarbonising our energy system through lower and more stable energy costs, greater energy security and reduced emissions. In addition, the NEDS will aim to provide incentives and benefits to customers who can participate in demand flexibility.

2.5 Three Mechanisms to Enable Demand Management

The CRU considers that there are three broad mechanisms for enabling demand management in order to deliver the strategy objectives.

1 **Implicit Flexibility**. Responses to incentives, such as those offered through prices of tariffs, leading to "implicit" demand reduction or shifting - aligned with Area 1 and Area 2 of the EDS.

2 **Explicit Flexibility**. Flexibility procurement, where contracts are agreed or products are designed and purchased to deliver a defined flexibility response ("explicit" flexibility) - aligned with Area 2.

3 **Mandatory Requirements**. Such as conditions associated with a connection – likely agreed at the point of connection or adopted as part of a modified connection agreement (e.g. expanding a site). Other mandatory requirements could include planning requirements or for example mandatory smart charging standard for EVs - aligned with Area 1, Area 2 and Area 3.

The CRU notes that these are not exclusive: some procurement purchases/contracts can take on the appearance of price signals (e.g. opt in tariffs), and some non-firm connections can be negotiated or traded in a way that makes them look like long-term flexibility products. All three of the above are viable mechanisms for securing flexibility with a role to play in the NEDS and can deliver similar physical effects in terms of their demand response.

Importantly, the contributions of these mechanisms to system flexibility may change over time due to the evolving energy landscape, including policy and regulation. Certain mechanisms that were once considered "explicit" may become "implicit"; the boundaries and categorisation between the three mechanisms to deliver flexibility are fluid. The CRU considers that to accurately determine the progress made with respect to the flexibility target, it is important to consider all three mechanisms. As the NEDS progresses, it is crucial to adopt an iterative approach that is adaptable and considers additional avenues to deliver flexibility alongside existing measures. Progress towards the target will require flexibility participation from both new and existing system users and the CRU is committed to ensuring that the NEDS reflects this dependency. The CRU is committed to ensuring that all parties have equitable access to the various avenues for enabling flexibility in the energy market through establishing transparent and open routes to participation.

2.6 Three Focus Areas

The proposed Focus Areas of the NEDS are illustrated in the figure below.

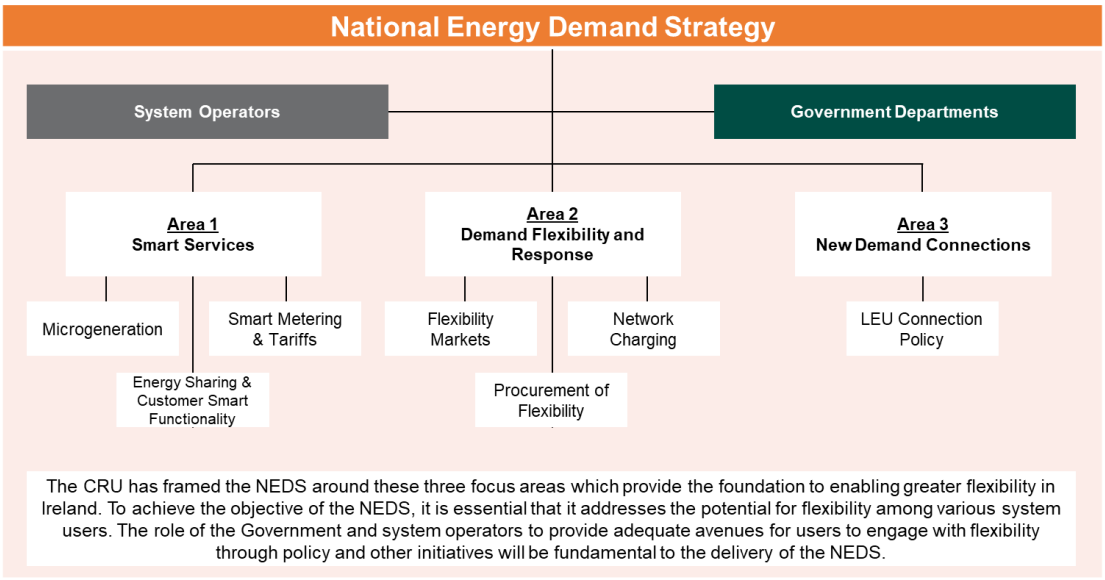


Figure 3 - Overview of NEDS focus areas

Area 1: Smart Services – The Smart Services Area aims to introduce measures that will encourage greater flexibility among domestic customers and smaller business customers. In the Call for Evidence, the CRU explained how smart meters and smart services can deliver benefits to consumers, the environment, and the energy system. Over the coming years, suppliers' development of smart services will be central to making flexible demand incentives and opportunities available and accessible in flexibility and wholesale markets for end consumers.

In a more immediate timeframe, to help consumers better understand and compare smart time of use tariffs, the CRU published a separate consultation alongside the EDS Call for Evidence paper. Within the 'Incentivising the Uptake of Time of Use Tariffs' Consultation Paper, the CRU consulted on four measures related to how time of use tariffs are advertised and compared within the market. These measures were proposed to give consumers more information to help them decide whether to adopt a time-of-use tariff and compare offerings. Alongside the more dynamic behaviours which suppliers can support customers to adopt through smart services, encouraging consumers to move some of their consumption away from peak times to off-peak times and periods of high renewable output creates more flexibility on the electricity grid, which helps Ireland manage the balance between electricity supply and demand. Further detail on proposals for Smart Servies is included in Chapter 3 of this consultation.

Area 2: Demand Flexibility and Response – The CRU seeks to develop incentives and measures to provide demand response at certain times, or system conditions.

The National Network, Local Connections (NNLC) Programme has been established by ESBN to deliver the transformative change required on the distribution system to meet ESBN's Price Review 5 (PR5) targets and the CAP targets. PR5 is the current five-year regulatory framework that governs the electricity network. Through the NNLC programme, ESBN is working with, and for, customers to enable the fundamental changes required to decarbonise Irish society, and to change how energy is generated and consumed. As the CRU develops Ireland's NEDS, the NNLC Programme will play a central role to enable and incentivise the demand flexibility and response required to meet national targets.

In Q4 2022 the CRU issued ESBN a direction to accelerate and expand the scope of a number of initiatives under the NNLC programme to facilitate bringing greater demand flexibility to the system sooner and broaden the scope of flexibility services to focus more on carbon abatement. The initial focus of this acceleration was to reduce the 2022/23 Winter peak consumption by at least 5% in line with EU targets set in the EU emergency regulation on high prices. The 'Beat the Peak' programme successfully piloted measures aimed at reducing electricity demand by between 40 and 160 megawatts (MW) of energy. In the near term ESBN also plans to consult on a procurement of up to 500MW of flexibility, including, but not limited to, battery storage. Further details are provided on demand flexibility and response proposals in Chapter 4 of this NEDS consultation paper.

In the short term it may be necessary to focus on the development of products which target flexible demand from specific technologies or customer segments, due to their higher technical or economic propensity to deliver flexibility in the near term. However, an enduring regime would be one where there are technology options, business models and sufficient market-based incentives through flexibility markets, balancing services, and wholesale market arbitrage to stimulate demand flexibility across all cohorts of demand.

The CRU recognises that a degree of demand flexibility exists in the SEM (including system services, capacity, and wholesale energy markets) and that ESBN has piloted several initiatives but there is a need to establish a wider range of commercially viable products that can accelerate the adoption of flexible demand and secure material volumes of flexibility on an enduring basis across the energy system.

How network tariffs are structured, and the accuracy with which they reflect underlying costs, can also directly influence how generators and demand customers use the networks and the value of their flexibility to the system. The CRU will consult on options to incentivise the delivery and use of flexible capacity and services, building on the evidence from the 2021 Electricity Network Tariff Structure Review Call for Evidence.

Area 3: New Demand Connections – New demand offers a potential route to increase flexibility. This Area is initially focused on targeting very LEUs seeking to connect. This will include a review to provide a pathway for new LEU connections to the electricity and gas systems which minimises the impact on national carbon emissions. This may be through the provision of connections which are low to zero carbon emissions, and/or where LEUs bring significant flexibility when they connect.

This Area is discussed briefly in Chapter 5. The Electricity Connections Policy team in CRU is currently developing a consultation paper building upon the Call for Evidence on Review of Large Energy Users connection policy (CRU/202357) and reflecting information and feedback received. It is anticipated that this subsequent consultation on Review of Large Energy Users connection policy will be published in January 2024. This paper will further explore the challenges faced and set out different options available.

2.7 MONITORING PROGRESS OF THE NEDS

In order to assess if the strategy is working effectively and on course to deliver the objectives, performance against targets should be measured at appropriate intervals. The NEDS is being developed to meet both the specific ambition set out in the Government's CAP23 with reference to flexible electricity demand and to support wider decarbonisation and security of supply objectives. This is aligned with the CRU exercising its functions in a way that is consistent with the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.[18] Interim targets were set in CAP23 at 15-20% demand side flexibility by 2025 and 20-30% by 2030. The 2025 and 2030 targets were set as a means to focus efforts to develop activities that would result in reducing carbon emissions associated with electricity and gas demand.

However, a definition for demand side flexibility was not provided in CAP23. One key objective of the first phase of the NEDS project is therefore to develop a definition for demand side flexibility. This definition can then support development of a methodology for measuring and estimating flexibility.

In this chapter a definition of demand flexibility is proposed which could support estimation and measurement. Further detail is provided in Annex V regarding a potential framework for the measurement of flexibility and Annex VI provides an overview of the status and potential for system flexibility. This illustrates the challenges, complexity and inherent uncertainty associated with quantifying demand flexibility. The overall effort required to calculate flexibility for each cohort would be significant with an error margin to be factored in due to reliance on a number of assumptions.

Input was also sought from stakeholders on this topic in the EDS Call for Evidence Paper. The range and diversity in responses reflect the significant challenges associated with developing an acceptable definition and method for calculation. A common theme throughout the feedback received was to suggest that a decarbonisation and/or carbon intensity component should be included.

As such it is proposed to track progress in two ways. First, by setting or identifying appropriate programmes of work which will contribute towards the strategy objectives and tracking their progress. If one of these programmes is under- or over-delivering, it may be necessary to

[18] s. 15(1)(d)), 2015 Climate Action and Low Carbon Development Act

adapt the approach for that programme, or cohort, and ramp up or down efforts in other areas in line with supporting decarbonisation at the lowest cost.

Secondly, by reviewing the impact of these work programmes on carbon emissions. This will likely be through engagement with the relevant bodies, such as the EPA and SEAI, to understand how best to review the impact and whether additional data are available that can be used to support. It is recognised that this is an imperfect arrangement, especially given that there are other actors which will have an impact on the changing emissions profiles. This will be a learning process, with details to be developed further. To support this measurement effort, further transparency is required to provide entities with information regarding their share of carbon emissions within the relevant SEC(s). In order for every energy user to play their part in the NEDS and reduce and/or flex their energy demand with a view to reducing emissions, they must first understand their associated emissions. This is a key proposal for this consultation; for DECC to carry out work to address this gap, with support from the appropriate State Agencies.

Given some assumptions, the CRU has estimated that the electricity system today has limited demand flexibility of approximately 5%, as per the CRU's proposed definition detailed in section 2.9. Considering the 2025 target, the CRU considers that the initiatives, reforms and proposals described in the NEDS can contribute significant additional flexibility. In the near term, the focus will be on explicit flexibility as the foremost mechanism as a framework is established to support a longerterm contribution from implicit flexibility and mandatory requirements.

Looking beyond 2025, while maintaining the guiding principles set out earlier, the CRU will seek to build on near-term regulatory and policy initiatives to improve the demand flexibility position of the electricity system towards 2030 targets and ambition beyond 2030. The CRU will also refine its understanding and measurement of demand flexibility to make sure that it is as effective and efficient as it can be, recognising that not all forms of flexibility are equally valuable to the network and system.

The chart below shows an illustration of a potential pathway for the development of flexibility that can be delivered through the NEDS across the three approaches described in section 2.6. Further discussion of the underpinning assumptions is provided in Annex V. The indicative contribution from explicit flexibility in 2030 includes some capacity which is contracted by 2025 but may not be operational by this date.

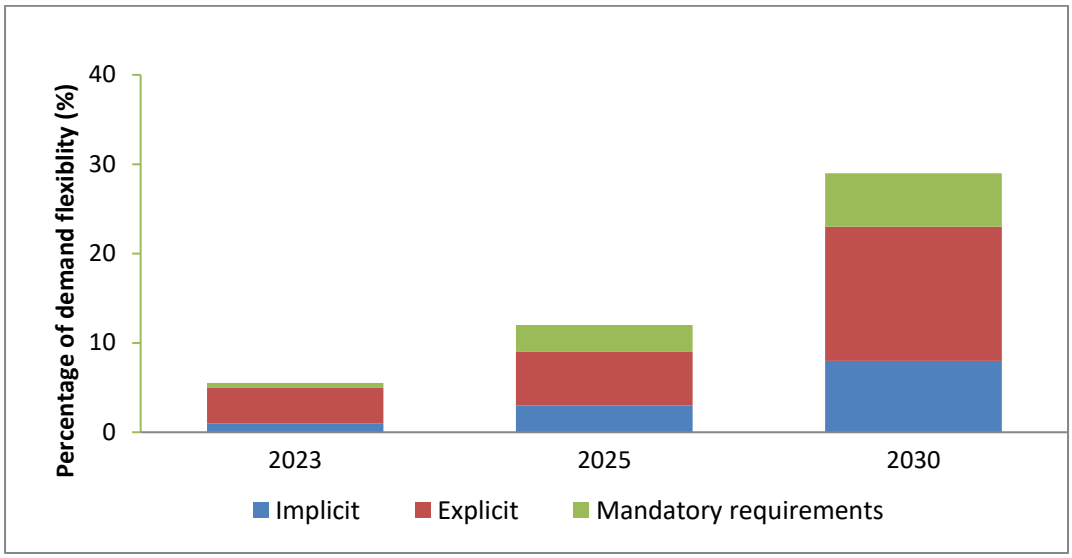


Figure 3: Illustration of potential contribution to target of mechanisms for flexibility

2.8 Strategy Timeline Overview – A Phased Approach

The CRU proposed that the NEDS is delivered in several phases. Phase 1 (2023 – 2024) defines the strategy and takes action on elements which potentially have high impact and can be progressed in the short term. Phase 2 (2024 – 2026) is focused on increasing the uptake and diversity of flexibility enabling products and technologies, as well as developing the markets, standards and frameworks. Phase 3 (2026 – 2030) will deliver increasing volumes of flexibility while enabling scaling of competitive and liquid flexibility markets. Subject to revision the proposed potential pathway between now and 2030 is summarised below. In addition to the formal progress report, more regular (e.g. 6-monthly) reviews of progress against identified programmes and proposals are anticipated. Further detail of the proposed approach for implementation of the NEDS is provided in Chapter 7.

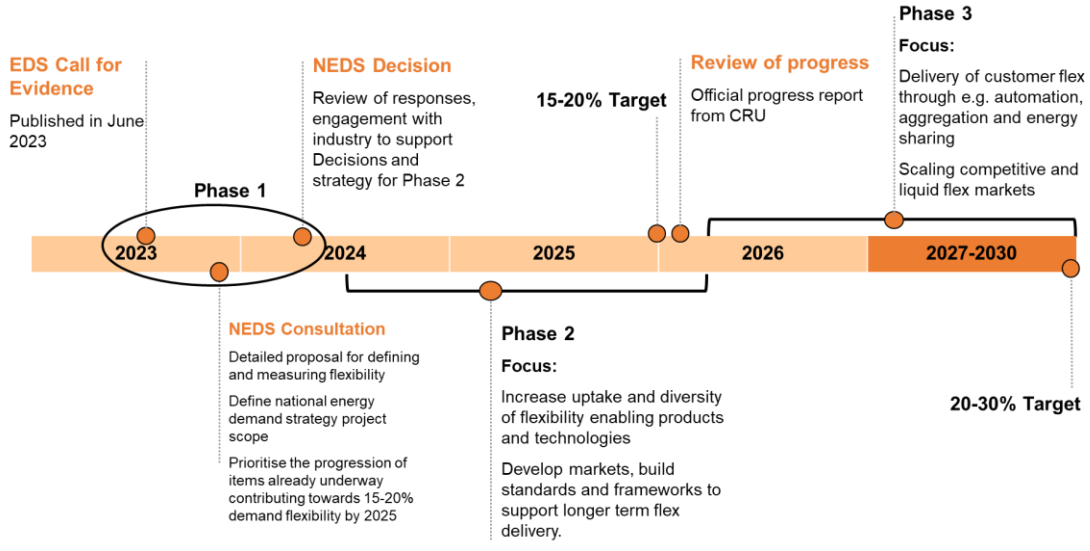


Figure 4: Phasing of the National Energy Demand Strategy in the context of Government targets

The various workstreams pertinent to the NEDS and their associated publications may progress on different timescales, noting that, for example, a Consultation on New Demand Connections and a number of publications progressing Smart Services workstreams are expected to be published in the coming months. Work is also being progressed, by the CRU and others, on the supply side to support decarbonisation which is not within the scope of this project. This includes workstreams such as reviewing the current Enduring Connection Policy process for grid connection applications from generators and systems services providers and enabling hybrid connections.

2.9 Defining demand-side flexibility

CAP23 assigned an action to the CRU to lead the development of "[an] Electricity Demand Side Strategy and Implementation Plan". The CRU has considered the scope of the strategy more broadly to adopt a whole system approach to facilitate greater flexibility and support decarbonisation. The CRU has therefore considered the relevance and implications for the gas network as part of the NEDS. It is important to account for the potential effects of change in one area of the energy system, or for one energy vector, on others. As the demand flexibility targets pertain to electricity demand and, given the need for electricity flexibility to support a range of system needs, including congestion management and balancing of supply and demand on a half hour basis, the CRU has defined the concepts below in relation to electricity.

Demand: Electricity demand is the amount of electricity that is needed by consumers. It will vary by season and by the time of day. *System demand* is the demand for electricity that is metered and visible on the transmission or distribution network.

Supply: Electricity supply is the amount of electricity that is provided by generators and interconnectors.

Flexibility: Flexibility in terms of electricity is the ability and extent to which the electricity system can adjust its supply and demand to support congestion management or achieve an energy balance, whereupon the demand for electricity is matched by its supply in different locations as well as nationally.

Supply Flexibility: Supply flexibility is the ability of the supply on the electricity system to adjust or "flex" up or down in order to match the current demand and meet other system needs. Supply flexibility has traditionally been the main way the system has been balanced.

Demand Flexibility: Demand flexibility is the ability of the demand on the electricity system to flex up or down in order to match the available supply or meet a number of system needs. This initial broad definition is further developed in subsequent discussion.

These concepts provide a basis for a detailed proposed definition of demand flexibility that is tailored to the NEDS vision and can allow for assessment of progress towards the NEDS objectives and flexibility targets.

2.9.1 How do the strategy objectives and principles inform the detailed definition of demand flexibility?

The CRU needs to make choices in defining demand flexibility in more detail that enable us to progress towards the target whilst also benefitting the environment, customers, and wider ambitions for the energy system. There are several options to establish the scope relevant to the target. The definition for demand flexibility should reflect the NEDS objectives and the proposed principles set out in Section 2.4.

The CRU pose six clarifications regarding what should be included as demand flexibility to meet the target. These clarifications can inform an approach to determine scope for demand flexibility. A more detailed explanation of the clarifications can be found in the Annex.

1. Should interconnectors be included in the definition of demand flexibility?

The CRU acknowledges that interconnectors provide a significant source of supply and demand flexibility with interconnector flows determined implicitly by market prices. However, the CRU proposes that flexibility from interconnectors is not included within the scope of the NEDS in order to focus on the opportunity and role for demand flexibility within Ireland.

2. Should storage (including batteries, pumped storage and other storage methods) be included in the definition of demand flexibility?

The CRU's view is that storage is a key source of flexibility, and without it, achieving the demand flexibility targets will be very challenging. Storage can enable the reduction of curtailment of renewable energy and reduce the consumption of higher carbon intensive electricity at times of low renewable generation. It can also act as a source to supply energy at peak times. Therefore, the CRU is minded to include storage in the definition, except that which is being used for the provision of sub-settlement period system services.

3. Should energy efficiency be included in the definition of demand flexibility?

While energy efficiency helps reduce peak demand, it is not the same as demand flexibility and does not enable upwards demand response at periods of high renewable output. The goal of demand flexibility is not to solely target demand reduction. Furthermore, it would not be desirable to create a perverse incentive either. The CRU therefore proposes to exclude energy efficiency from the definition, given that energy efficiency is suitably incentivised and measured in other policy areas. Permanent demand reduction would be reflected in a reduction in total demand.

4. Should demand flexibility that provides system services contribute towards the target?

The CRU's view is that short-term flexibility can play a critical role in maintaining security of supply. The demand side, including storage, already provides flexibility in the form of system services (DS3) and participation in the energy markets, in particular the balancing market. The focus for demand response on the provision of system services is generally fast acting and at a sub-settlement period timeframe. The provision of demand response in the balancing market

generally has longer response times, in particular relating to the grid code requirement to be able to provide at least 2 hours of response. The objectives of the strategy around demand flexibility are focused on utlilising renewable energy, reducing system emissions and increasing network capacity in the longer term.

Therefore, the CRU proposes to exclude short term flexibility providing sub-settlement period system services from the proposed measure of demand flexibility.

5. Should non-procured demand flexibility be included in the definition of demand flexibility?

The CRU considers that non-procured demand flexibility should be included. The CRU considers non-procured demand flexibility as flexibility that is generated in response to signals, such as price, but is not necessarily contractually obligated to, for example, the TSO or DSO, to provide a response. For example, a household that reduces its demand due to a time of use tariff would not be contractually secured demand reduction, but it would be a response due to an increased price at peak hours.

6. Should flexible demand connections be included in the definition of demand flexibility?

Flexible connections are connection arrangements whereby an energy users import or export of energy (electricity or gas) is managed under certain conditions. The CRU considers that non-firm or flexible demand connections should be included as demand flexibility. While the expectation for a flexible connection is that it would become a firm connection in the future, the ability of the SO to turn down demand to those on a flexible connection means that it in effect contributes to demand flexibility.

2.9.2 Proposed demand flexibility definition: Volume Shift

Building on the previous sections and feedback received from respondents to Question 4 in the EDS Call for Evidence paper, “What are stakeholder’s views on the definition for demand flexibility”, four options were considered. These are summarised in the table below. Consideration is also required if it is measured against peak or some other time period, and whether account is taken of the time duration of the shift in demand. Further details are provided in Annex III Demand Flexibility Definition - Four Options.

Table 3 - Summary of definition options

Option Name	Definition	Explanation
System Peak	Peak system demand reduction as a proportion of peak system demand (MW)	Numerator (measure of flexibility): The power in MW that is available at the time of system peak demand to be reduced

		Denominator (measure of total demand): Peak system demand in MW
Customer Peak	% of customer peak demand (MW) that can be shifted by at least the settlement period (half-hour) on an average day	Numerator (measure of flexibility): The aggregate amount of power across consumers in MW that can be shifted by a certain number of hours away from the consumers' annual average individual peak. Denominator (measure of total demand): Aggregate of consumers' average peak demand
Volume Shift	% of average daily demand (MWh) that can be flexed up or down	Numerator (measure of flexibility): Volume of energy in MWh that can be flexed up or down Denominator (measure of total demand): Average daily consumption in MWh.
Compound Volume	Shiftable load multiplied by the hours that it can be shifted as a share of average daily load	Numerator (measure of flexibility): Load in each hour, that can be shifted, multiplied by the amount of time it can be shifted by (MWh). Denominator (measure of total demand): Average daily consumption in MWh over 24 hours

The CRU proposes the use of 'Volume Shift' as the definition of demand flexibility on the basis that it more accurately reflects the volume of demand that is being moved from one point in time to another, in comparison to the alternative options. Using a definition measured in MWh will value sources of demand flexibility that can provide downwards demand response or upwards demand response for longer periods of time more highly.

Below are some illustrative examples of what a volume shift definition could look like. The CRU have taken the proportional MW contribution from ESBN's 15-20% scenarios for 2025 and beyond and converted this into MWh contributions for different sources based on an illustrative number of hours that demand can be turned down or up over a 24 hour period. With reference to EirGrid's All Island Generation Capacity Statement for 2022-2031, by 2025 approximately 100,000 MWh/day of demand might be expected. If 15% of this demand is flexible, this would result in a requirement for 15,000 MWh demand flexibility each day.

Table 4 Potential levels of flexibility required for each type of source of demand

Source	Illustration	MWh	Share
Storage	500 MW of storage with an average duration of 6 hours and the assumed capability to cycle twice in a 24-hour period: *500 MW x 6 hours x 2 cycles = 6000 MWh*	6,000	40%
Transport	200,000 EVs with an average battery size of 45 kWh. 25% of EV capacity charges each day and is capable of smart charging, shifting consumption in response to price or other system signals: *200,000 x 45 kWh x 25% = 2,240 MWh*	2,250	15%
Industrial	500 MW of average daily industrial load that can shift 25% of its daily demand to another period within day: *500 MW x 24 hours x 25% = 3000 MWh*	2,700	18%
Domestic	500 MW of average daily demand load that can shift 20% of its demand over the course of a day: *500 MW x 24 hours x 20% = 2400 MWh*	2,550	17%
Commercial	300 MW of average daily demand load that can shift 20% of its demand over the course of a day: *300 MW x 24 hours x 20% = 1440 MWh*	1,500	10%

2.10 Measuring Progress Against the Flexibility Target

Establishing a clear and robust definition of demand flexibility will allow progress towards the target to be monitored more efficiently. The CRU understands that when measuring demand flexibility from different cohorts, different methods may need to be applied to calculate the level of demand flexibility. This is especially true for smaller-scale customers that are either behaving in a flexible manner due to behavioural change or due to non-procured incentives (such as the 'Beat the Peak' programme from ESBN).

The CRU intends to measure progress against the target at the end of Phase 2 (Q1 2026). Annex V provides an initial overview of what data may be required and the parties that may need to be involved in providing this.

2.11 Progress to Date and Potential Across Cohorts

In the near term the most viable routes to unlock demand flexibility appear to be through growth in storage, and realising the potential from LEUs. Additional, smaller contributions from domestic and commercial customers are achievable by 2025. The CRU's current estimation

of available flexibility, (as per Table 5 below) is estimated in line with the CRU's proposed option for the proposed definition of flexibility which is based on a volume (MWh) based measure (and using assumptions described earlier in this chapter and in the Annex).

It is generally accepted that there is limited demand flexibility available across all sources, as per the proposed definition of demand flexibility. Table 5 indicates the estimated levels of flexibility that can currently be called on at times of system peak demand. This illustrates the low starting point of demand flexibility that currently exists for the various cohorts. Significant efforts are required to unlock the behavioural changes, incentives and investment sufficient to meet the 2025 and 2030 targets for demand flexibility.

Table 5 Summary of current flexibility - provided in MW in accordance with Customer Peak flexibility option and as a percentage of average daily demand in accordance with the 'Volume shift' definition

Cohort	Storage	Transport	Domestic	Industrial and LEUs	Commercial
Current estimated demand flexibility	330 MW 3% of average daily demand	<10 MW <1% of average daily demand	70MW <1% of average daily demand	600MW 1% of average daily demand	100MW <1% of average daily demand

In Annex VI, a more detailed overview of the current levels and progress of demand flexibility is set out alongside a further assessment of the CRU's ambition for demand flexibility in the future. The CRU intends to establish a framework to incentivise flexibility across all cohorts of electricity demand.

Consultation questions:

1) Do you agree with the overall approach to the NEDS?
2) Do you agree with the sources of demand flexibility that have been identified (storage, transport, domestic, industrial & LEUs, commercial)? Are there other sources of flexibility that could contribute to the demand flexibility targets?
3) Do you agree with the assessment of what customer cohorts and technologies are in scope for the demand flexibility target?
4) Do you have additions or modifications to offer on the summary of the key mechanisms through which market participants can provide flexibility?
5) Are there additional contributions (i.e. other actions or proposals) to the NEDS that should be considered from stakeholders such as Government departments, SOs and State Agencies?
    - Particularly with regards to the gas network. Are there other proposals which can be included in the NEDS that contribute towards the overall objective of aligning the gas demand forecast, or more specifically the associated carbon emissions forecast, with the carbon budgets?
6) Do you agree with the proposed clarifications for defining demand flexibility?
7) Do you support the proposed *Volume Shift* option for defining demand flexibility?
8) Are there additional considerations or clarifications required in defining demand flexibility?
9) Do you agree with the view on progress to date?

3. Area 1: Smart Services – Supporting Customer Participation

This chapter describes the increasingly important role of domestic and small business customers in enabling demand flexibility within the Irish electricity system. Firstly, it discusses the potential to foster customer engagement to make more informed energy choices enabled by smart meters, devices, services, and tariffs that can simultaneously benefit customers and the electricity system through increased demand flexibility. Then it considers the role of EVs: with their increasing number it is important to effectively leverage their potential to contribute to system flexibility. Options for incentivising customers in the near term are detailed alongside initiatives to build the longer-term market framework; this framework is needed to facilitate the channels and behaviours for customer engagement in the future system. The figure below provides an overview of this focus Area and the key proposed initiatives.

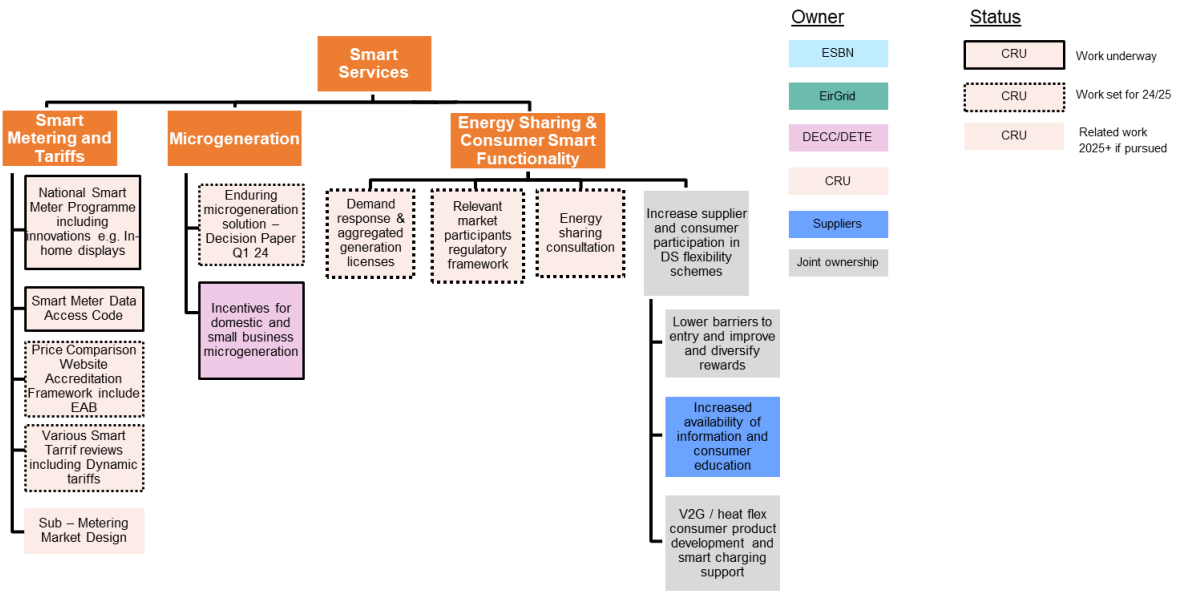


Figure 5: An overview of focus Area 1 and the associated key activities

3.1 The role of active customers and suppliers

Domestic and smaller business customers have a significant role to play in delivering flexibility.[19] The CRU considers there is significant and growing potential from these customers

[19] When customers are referenced in this section, it refers not only to domestic customers but also smaller business and other non-domestic customers. As a guide, smaller customers are considered as those with connections in DUoS Groups DG1 – DG6. ESBN DUoS & Meter Configuration Codes Description

as new low carbon technologies (such as solar PV and heat pumps) are deployed. Accessing this flexibility will require a series of actions including the development of new tariffs, flexibility incentives and services by the DSO and energy suppliers, alongside the adaptation of consumer behaviour.

The CRU expect consumer flexibility to provide a small proportion of system flexibility in the near term (under ESBN's central scenario, there is an assumption of approximately 15% of potential demand side flexibility per household[20]). However, the CRU anticipates that the role of customers in providing flexibility will become more significant as mechanisms are developed and become established.

The electricity retail market will need to change dramatically to deliver the customer offering that will support Ireland in meeting its flexibility and decarbonisation ambitions. There is a need to incentivise customers to engage with market changes and to provide them with the right information to participate. Customer participation requires the coordination of different industry parties, including suppliers, ESBN, aggregators and customers themselves.

Electricity suppliers play a key role in delivering demand flexibility through viable offerings such as Smart Tariffs and other demand reduction initiatives. Suppliers are currently tracking initiatives and sending details to the CRU in quarterly reports. These reports focus on demand reduction and energy efficiency objectives including lowering peak demand, reducing overall demand, and shifting demand from periods of high carbon to low carbon. These reports will inform the CRU on future policy pertaining to the NEDS and allow the CRU to track the efficiency of demand management actions. It is envisaged suppliers will play an increasing role in the NEDS through their direct interactions with customers.

3.2 THE RETAIL MARKET AND PRODUCT OFFERING

In June 2023 the CRU published the Roadmap for the Clean Energy Package's (CEP) Electricity and Renewables Directives (CRU202350), the 'CRU's CEP Roadmap'. This document set out a range of measures that the CRU will be taking to implement the requirements of the Directives. Many of these will directly contribute to incentivising and encouraging customers to deliver flexibility to the market. The CRU is also undertaking and planning work across several areas related to the retail electricity market that will contribute to encouraging active customers and greater flexibility. Below is an overview of some of the areas, timelines for delivery where available and how the CRU envisages they will each support greater flexibility.

3.2.1 Smart Metering

By the end of Q3 2023 over 1.4 million smart meters had been installed in Ireland and that number is expected to exceed 2 million by the end of 2024. Smart meters are a transformative technology that support the development of a range of services for customers as well as

[20] Scenarios for 15-20% Flexible System Demand ESBN Paper

enabling flexibility on the system. Options for use of smart metering data to calculate aggregate demand at the supplier level can be considered and may provide appropriate price signals to suppliers, better aligning the incentives between the wholesale and retail markets. Furthermore, there is the possibility to enable the Meter Registration System Operator (MRSO), a specific function within ESB, to utilise smart meter data to calculate supplier load profiles. This could provide an incentive for suppliers to offer Time of Use (ToU) tariffs to consumers and explore options to encourage their uptake. The provision of this data could improve the efficiency of the wholesale electricity market.

The CRU will continue to focus on overseeing and supporting the roll-out of smart meters, including the development of relevant policy to support the delivery of smart services to customers. In the next 18 months, this will include development of policy in relation to the provision of In-Home Displays. This will be another tool that will provide information to customers and support areas such as dynamic tariffs.

3.2.2 Time of Use Tariffs

ToU tariffs encourage customers to shift consumption away from times of peak demand or system stress whilst also incentivising consumption during periods of high renewable generation with typically lower prices. It is hoped that over time, the number of customers availing of ToU tariffs will increase significantly. This will help shift some of the demand away from peak hours. As of September 2023, 8% of consumers with a smart meter currently avail of a ToU tariff. Research commissioned by the CRU suggests that consumers see the main benefits of smart meters as an ability to reduce bills, better understand consumption, change their tariff, and help the environment. However, it also suggests that most consumers with a smart meter do not fully understand its purpose and function. As such, there is scope to increase awareness and information provision around smart meters, to help consumers inform their decision making around taking up time of use tariffs.

The CRU's Decision paper on Electricity Network Tariffs [CRU202291] as part of the National Energy Security Framework[21] detailed various measures the CRU has committed to implement to incentivise and support demand response In Ireland. Included in this Decision was a requirement on EirGrid to establish a communication system that notifies LEUs in advance of a system alert and a low system non-synchronous penetration (SNSP) event. This advanced alert communication system would allow LEUs to make voluntary demand response decisions to support the overall system and enable the CRU to determine the responsiveness of system users. Furthermore, such communication systems will be pivotal to the development and implementation of any future tariffs, for example, dynamic tariffs which may involve close to real-time signals. These capabilities will be instrumental in enabling greater flexibility supported by robust systems and it underscores the crucial role that other stakeholders such as SOs hold in delivering the NEDS. The CRU is committed to engaging with EirGrid on this requirement to ensure that a process can be developed for communicating forecasts of system

[21] CRU – Electricity Network Tariff Review 2022/2023 Response and Decision Paper

alerts and/or periods of low renewable generation to network users to facilitate demand response.

3.2.3 Dynamic Tariffs

The CEP requires the introduction of Dynamic Tariffs. Dynamic tariffs will not be suitable for all customers; however, some customers may be able to reduce their electricity bills by responding to price signals in the market. For example, electricity may be cheaper at night when there is a high volume of wind on the system, but more expensive at peak times when there is high system demand. The CRU intends to consult on the requirements for dynamic tariffs, with a decision in mid-2024. The CRU expects that all suppliers with more than 200,000 final customers will have dynamic tariffs in place by the end of 2024.

The delivery of dynamic tariffs will support greater flexibility in the market as any customer with such a tariff will be engaged in the market and directly incentivised to respond to market signals around price. In Norway, where most households have electricity contracts tied to the hourly spot price of electricity, householders generally provide implicit demand response via shifting their usage to enable energy savings. This implicit demand response through dynamic the tariffs was found to be most common when the household had an EV and the consumer was partaking in smart charging[22]. The development of dynamic tariffs is likely to support more flexibility from domestic electrified transport. The CRU aims to support the relevant parties in developing propositions for smart charging and vehicle-to-grid (V2G) services. V2G technologies enable EVs to both charge and discharge electricity, this capability can support the wider system management in balancing supply and demand, particularly during periods of peak demand or system stress. This could facilitate the growth of flexibility in Ireland, particularly through the design of propositions that incentivise users to support system management and are compensated for their participation.

3.2.4 EV and smart appliance flexibility

The CRU seeks to support conditions in which consumers and commercial operators can readily participate in EV flexibility.

One key barrier to significant flexibility from EVs is the absence of incentives, products, or services (for example smart connections, smart charging products from electricity suppliers), and as a result, the current low uptake of smart charging technologies for EVs in Ireland. Although EV uptake is expected to grow significantly in the coming years with 200,000 passenger EVs and 20,000 commercial EVs to be deployed by 2025, accelerating to 800,000 passenger EVs and 100,000 commercial EV's by 2030. In addition to the limited incentives to adopt smart charging technologies, there is also a technology barrier for V2G chargers which remain technologically and commercially very immature.

[22] Residential Demand Response and Dynamic Electricity Contracts With Hourly Prices: A Study of Norwegian Households During the 2021/22 Energy Crisis

Smart charging allows management of energy flows to any plugged-in EV. This can be optimised to vary depending on how many people are using electricity at that time, putting less pressure on the grid, and to align with lower priced and lower carbon periods. Smart charging also prevents charging operators from exceeding their building's maximum import capacity, as defined by local grid capacities and their chosen energy tariff.

At present a limited range of vehicles could provide V2G due to their charging technology, as well as consumer concerns regarding the impact on their batteries, and the absence of offerings in the market that might mitigate this concern (for example battery leasing or managed battery services). CharIN, the body promoting the Combined Charging System (CCS) technology, currently the predominant standard for EVs in Europe, has indicated a date of 2025 before it can support V2G. Chargers and EV battery systems are being developed to provide new controls and services such as mobile and automated EV charging systems. These will enable charging points to automatically respond to price signals or to availability of renewable energy and enable V2G or Vehicle-to-House (V2H) systems.

While there are supporting initiatives and trends in customer behaviour to overcome the technology and uptake barriers, there needs to be a market environment to actively incentivise the adoption and use of V2G or smart charging devices. While ESBN is working on the delivery of some flexibility products, it is critical to broader uptake that tariffs and products be developed by suppliers and offered to energy customers. There are some limited examples of products incentivising smart charging in the Irish market. Electric Ireland's Home Electric+ Night Boost tariff is an example of a ToU tariff that involves a dynamic price structure to incentivise consumers to shift their energy usage away from peak demand periods. Customers with a smart meter and EV can utilise the tariff's night time rate, which is half the price of the daytime rate, with an even cheaper rate between the hours of 2am and 4am. This product benefits customers with lower energy bills whilst simultaneously contributing to a more stable electricity system.

Zero Emissions Vehicles Ireland (ZEVI) was set up by government to draw on international best practises and CRU will work with ZEVI to leverage expertise across bodies that deliver key EV policy measures. ZEVI will have a role in supporting suppliers and ESBN in development of these products. Although smart charging and V2G may only become a reality at scale from 2025 onwards, it is important that suppliers and energy companies begin to develop test and promote the consumer products which will stimulate to support early adopters and maximise incentives for uptake when the technology challenges have been addressed.

The DSO, ESBN, proposes to introduce standard 'flexibility readiness' requirements. These are technical requirements for interoperable telecommunications and control facilities for new electric transport connections (including domestic and commercial charge points, new bus depot charging fcilities or rail developments). By introducing proven and proportionate technical requirements (which vary by installation type, differentiating between domestic and a range of commercial installations) this measure is designed to ensure that Irish electricity customers have access to all smart charging and flexibility enabling offerings. With the benefit of dynamic electricity pricing and time-of-use tariffs, smart, connected appliances will also allow users to reduce energy costs, reduce their carbon emissions, and shift the timing of their energy use to coincide with periods that benefit the wider energy system, such as times of

maximum renewable energy generation. The CRU will support development of standards enable the uptake of "energy smart" appliances and work with ESBN and the relevant industries (the supply chain for EV chargers and other systems which could be “flexibility ready”) to develop and approve flexibility readiness requirements.

3.2.5 Smart Meter Data Access Code

Since the publication of the CRU’s CEP Roadmap, the CRU has issued a Proposed Decision on Smart Meter Data Access Code (DAC) in July 2023 (CRU202387). As described in the paper, the delivery and implementation of the DAC will support a range of developments in the retail market. The DAC has the potential to support greater uptake of smart tariffs, by equipping suppliers with information required to advise customers of the best tariffs for their needs. It can support ESBN in relation to network planning and operation, as well as in development of flexibility services and solutions for customers.

The CRU received a total of 11 responses to the Proposed Decision paper and subsequently published an Information Paper on the Smart Meter Data Access Code (CRU2023158) alongside the collated consultation responses to the Proposed Decision paper on 11th December 2023.[23] The intention of publishing this Information Paper is to provide an update to stakeholders and inform them of the intended next steps. The CRU recognises the central role that the DAC can play in delivering on the potential of the smart metering programme.

The DAC will also enable the provision and development of Home Energy Management Systems (HEMS) by suppliers or other third-parties. In the future, it is likely HEMS will play a role in enabling greater flexibility from customers. HEMS usually incorporate a home control unit which acts as a gateway into a network of connected appliances. These appliances can include but are not limited to smart appliances, smart plugs, a smart meter, environmental sensors, microgeneration, EVs and battery storage. HEMS can automate the demand shifting for the customer, and when dynamic tariffs are available, they can automate demand management, based on price signals. Due to the lack of dynamic tariffs, and the immaturity and cost of HEMS at the time of writing, it is not expected that these systems will have a significant role to play during Phase 1 of this strategy. Such services could reduce the barriers to customer flexibility caused by the requirement for customer actions and could also have a role to play in enabling smart charging and V2G in the future. Therefore, CRU will monitor the development of the market and consider if there are enabling actions for deployment of HEMS it can support. For the near term the focus is on development of services and tariffs which would enable these HEMS to be most effective.

3.2.6 The CRU Price Comparison Website Accreditation Framework

The CRU issued a consultation on the uptake of ToU tariffs as part of the EDS Call for Evidence package. Within that consultation document, the CRU proposed a number of measures to improve the service offered by Accredited Price Comparison Websites and

[23] Information Paper on the Smart Meter Data Access Code | CRU.ie

ensure that the accreditation framework accommodated the latest developments in retail markets.

The feedback from respondents highlighted a number of issues with the CRU's Accreditation Framework and difficulties in delivering all of the proposed changes. It is clear to the CRU that there is a need for a broader review of the Accreditation Framework to ensure that accredited websites provide a service to customers that fully accommodates smart tariffs and other market developments.

Therefore, the CRU intends to consult on the Price Comparison Website Accreditation Framework in 2024. This consultation will review a number of areas, including:

- How to incorporate export tariffs,
- How to enable customers to use their smart meter data, either by uploading it to a price comparison website and/or by giving permission to the website to access their data directly,
- Ensuring that customers have access to price comparison tools that compare dynamic electricity price contracts,
- Ensuring that microenterprises with yearly consumption of below 100,000 kWh shall have access to price comparison websites.

The CRU wants to ensure that customers continue to have price comparison websites that deliver accurate and impartial information on the best tariff for them. This should encourage greater uptake of smart tariffs over time. This can, in turn, result in more active, informed customers who can consume energy more flexibly.

3.3 Creating the market framework for future customer participation

The CRU is also working across industry to consider how it can enable new business models for customers to purchase, trade and share energy. Below is an overview of some of the areas under consideration.

3.3.1 Demand Response & Aggregated Generation Licences

As outlined in the CRU's CEP Roadmap, under section 14 of Electricity Regulation Act (ERA) 1999 the CRU can issue a number of licences, including for supply and generation as well as for distribution and transmission SOs. The Renewable Energy Regulations 2022[24] amends the

[24] Renewable Energy Regulations 2022

ERA 1999 to include three new categories of licences for electricity undertakings. The CRU has been tasked with designing licences for electricity undertakings engaged in:

- Aggregation
- Demand response
- Energy storage

The CRU has now established a designated Licensing Team to progress work in the licencing area. As outlined in the Roadmap, the CRU intends to initiate work in 2024 to develop new licences for aggregation and demand response.

It is hoped that, in time, licencees might engage not just with larger energy users, but with smaller businesses and perhaps even domestic customers. With that in mind, the CRU will also need to consider what customer protection measures may be required for these licence types.

3.3.2 Development of a Framework for Relevant Market Participants

In addition to new licences, the CRU will be working on developing a regulatory framework for "Relevant Market Participants", which is a market participant that is not a licensed electricity undertaking. The development of a framework for Relevant Market Participants will allow new entities to enter the market and provide specific services to customers.

Energy communities and active customers are considered relevant market participants. The registration framework will outline the general requirements for participation in the market and the customer protections that must be upheld. The level of regulatory oversight applied by the CRU needs to be proportional to the scale, size and scope of the energy activity pursued by the market participant.

The current framework of supply and generation licences may not be suitable for smaller market actors such as energy communities. The associated administration may act as a barrier to entry and some of the conditions would not be appropriate. For example, the existing supply licence has conditions relating to market dominance and regulatory accounts, however the scale of energy communities is not likely to result in the exertion of overall market dominance.

These new, smaller entities may offer services that encourage the uptake of renewable technologies and flexibility. As they are likely to operate at a smaller or community level, they will also be able to engage and inform customers in a way that larger entities, such as a supplier or DSO may not.

To progress this workstream the CRU will commence a consultation process in 2024 considering the following:

- the requirements to be included in the registration framework,

- the specific activities or classes of relevant market participants that will not be required to register with CRU,
- the application and assessment process,
- the compliance and monitoring framework,
- the alternative dispute resolution (ADR) process.

3.3.3 Energy Sharing

The CRU supports the aggregation of community energy assets to enable greater scale of flexibility but acknowledges this is currently difficult to achieve other than through large aggregator companies. Community energy (shared PV for example) offers a route for those who cannot afford PV, or do not have a compatible roof, to invest in low carbon energy. The CRU explored the topics of energy sharing and trading in 2021 as part of its review on active customers and energy communities. This review determined that follow on/additional consultations would be required to progress this workstream. The CRU intends to commence a consultation process in 2024 with respect to energy sharing and trading.

ESBN is required under legislation[25] to facilitate the transfer of energy required to enable energy sharing amongst members of Renewable Energy Communities. The technical solutions to enable energy sharing need to be progressed in a way that does not interfere with the functioning of the distribution grid. There will also need to be consideration on how best to integrate energy sharing into the existing retail market. Therefore, the CRU intends to engage with ESBN on this topic in advance of progressing any solutions for consultation.

In developing a regulatory framework that enables energy sharing in the market, the CRU is mindful of the upcoming reforms to the Electricity Directive[26] in this area. Those reforms are likely to strengthen and expand the rights of customers to engage in sharing schemes and any decision with respect to energy sharing will need to be aligned with these changes.

The majority of energy sharing will likely be as a result of renewable microgeneration and where the renewable electricity is exported to the grid and shared with customers, it has the effect of matching generation and demand. Where sharing is done from a financial perspective, for example peer-to-peer, there will be an incentive for those exporting electricity to shift their consumption to times of low prices and share electricity at times of high prices. This means that those exporting electricity to share with others, are likely to be exporting at a time when the system benefits most, supporting flexibility and decarbonisation.

Based on the number energy sharing schemes and projects, particularly peer-to-peer, Europe is leading the world with a number of demonstration trials in Germany, Netherlands, Norway,

[25] Regulation 10 of SI 76 2022

[26] the Directive on common rules for the internal market for electricity (EU/2019/944) and the Regulation on the internal market for electricity (EU/2019/943)

Finland, and the UK which demonstrate the potential for scaling up. In the Netherlands, examples of peer-to-peer sharing projects include Powerpeers – for residential buildings to share their energy with one another using a blockchain-based energy market, and Vandebron – which offers a platform for electricity consumers to select desirable local sustainable producers.

The development of a framework for energy sharing will support the CAP23 measure for enabling 500MW of local community-based energy projects. Alongside engaging with ESBN, CRU can also apply learning from energy community projects which are being funded by the European Parliament. The Rural Energy Community Advisory Hub (RECAH) and Energy Communities Repository (ECR) had their closing conference in November 2023 highlighting best practice in enabling technical, regulatory and economic conditions for a consumer-centric market design.

3.3.4 Microgeneration

The primary goal of microgeneration is to reduce the amount of electricity that a customer needs to import. The growth of microgeneration on the grid also directly contributes to flexibility as customers are incentivised to shift demand to times when they can consume their own energy supply. Combined with batteries and ToU tariffs, microgeneration also incentivises customers to reduce load at peak times by storing excess energy and using it at times of peak prices. In addition, consumers that acquire microgeneration may increase their engagement and understanding of their electricity consumption, preparing them for flexible energy use.

At the end of Q3 2023 there were over 70,000 customers, mostly domestic, with microgeneration installed and over the course of the year, this number has grown by approximately 2,000 each month. With the ongoing grant supports available for domestic and business customers along with the finalisation of the Government's Small-Scale Renewable Electricity Support Scheme[27], there is likely to be continued growth in the number and scale of microgeneration on the system in the coming years. Therefore, it is important to ensure that, where possible, microgenerators can contribute to flexibility.

In September 2023 the CRU published a consultation paper on the Enduring Arrangements for Remuneration of Microgeneration Exports (CRU2023112), in which the CRU proposed amendments to the current, interim arrangements. The consultation paper addresses a number of areas that can give effect to greater flexibility and decarbonisation.

One of the proposals set out was in relation to the separation of contracted import from contracted export. This change would enable customers with one smart meter to have separate service providers for import and export. Hence, customers could have one supplier for their imported electricity, and a separate supplier for their exported electricity. Such a change would encourage new market entrants that could offer innovative, export-focused products and enhance competition in the space. Increased competition in the sector would

[27] DECC Consultation n a Small-Scale Generation Support Scheme (SSG) in Ireland

ensure that the most competitive prices are available to microgenerators for their exports, which in turn would encourage more people to consider investment in microgeneration. This could also make it easier for microgeneration customers to engage with aggregators, which would further promote flexibility.

The consultation also highlighted that suppliers currently offer their customers a flat rate for their exports, which provides no incentive for active customers to export at times when the system would benefit most. In future it is hoped that time of export (ToE) tariffs will be available (or even mandated). This would encourage active customers to export at times that provide greatest benefit to them financially, but also the greatest benefit in terms of system flexibility and decarbonisation. This incentive to export at times of higher prices/system needs will be increasingly important as the number of microgeneration customers and system renewable capacity grows.

The impact will also be facilitated by energy storage. This would mean, for example, that a PV customer could charge a battery during the sunniest part of the day and use the battery to export during the evening peak when the system needs it and there are higher export prices available. In addition, as the number of electric vehicles on the system increases and bi-directional charging becomes more prevalent, customers with an electric vehicle may also engage.

The consultation period was extended to the 24th November. The CRU will review the consultation response before issuing a Decision paper in Q1 2024.

3.3.5 Secondary Measurement Devices / Submetering

The CRU is aware that, as part of the ongoing discussion at European level around reforms to the Electricity Directive, there are considerations related to allowing customers to have more than one metering and billing point covered by the single connection point for their premises. The explicit purpose of allowing secondary measurement devices (or submeters) is to allow customers to participate in other incentive-based demand response schemes that provide flexibility services in the electricity market. Such arrangements could contribute to the increased uptake of demand response and to customer empowerment allowing them to have more control over their energy use and bills, while providing additional flexibility to the electricity system to cope with demand and supply fluctuations.

There are a number of ways that the introduction of sub-metering may facilitate greater flexibility. An example of this might be where a customer is on either a flat rate tariff or more static ToU tariff for their primary supply. However, they might have a sub-meter and secondary supplier for their electric vehicle. The customer might opt for a dynamic tariff from the secondary supplier, so at least that portion of their demand is providing additional flexibility.

Sub-metering could allow customers to engage with a Demand Side Aggregator for a portion of their demand. They may be willing to alter consumption patterns for their heat pump or electric vehicle charging to participate in such schemes. This means that customers who might not otherwise have provided flexibility, as they might not want to affect their primary supply, can still provide some flexibility.

The CRU is monitoring developments in relation to the reforms. Retail market design changes will be required for the retail market to function as envisaged by the CEP and any further reforms to the Directives. Currently, customers can only have one supplier connected to their Meter Point Reference Number (MPRN). However, in order for submetering to function, a customer is likely to need to be able to contract with more than one supplier. This is also required for separation of import and export described in the microgeneration section above. The CRU will engage in discussions with ESBN in 2023 and 2024 to further scope out what market design changes will be required, and the timelines for implementing those changes.

3.3.6 Reducing barriers and improving information

There is a clear need to engage successfully with customers in relation to the market developments and proposals described. Customers must be well informed about the new products and services available to them, otherwise there will be limited engagement and uptake; insufficient to support the kind of change and increases in flexibility needed to meet our targets and support decarbonisation.

The CRU is aware of several campaigns that have been run in recent years, including the following:

- The Government's "Reduce your use" campaign, which was introduced to "promote and encourage energy efficiency, while highlighting the range of government support that is available for households and businesses to assist with rising energy costs".
- In October 2022, ESBN introduced the 'Beat the Peak' campaign, to help customers take control of their electricity use and reduce electricity demand at times of peak events.
- In 2022 the CRU ran a social media campaign, to inform customers about the benefits of smart meters.
- Numerous supplier campaigns related to Time of Use tariffs and smart services have run across various platforms.

There is no one approach or channel that will suffice for engagement with customers. Depending on the initiative, different parties will need to lead on engagement with customers. For example, in the short term when running a preliminary flexibility and/or educational initiatives, for example "Is this a good time"[28], ESBN may be best placed to engage and inform customers. Similarly, as demonstrated by "Reduce Your Use" and the CRU smart metering campaigns, the government, CRU and SEAI have an important role as a trusted source of consumer interest information. However, to drive widespread awareness, consumer interest and desire to participate, suppliers will need to lead on engagement. This will be critical for driving customers' participation when it comes to promoting/informing around consumer facing products, for example ToU tariff offerings, smart services and flexibility products they develop for consumers.

[28] ESBN Energy Events & Rewards – "Is this a good time"

There will be a need for ongoing engagement and awareness raising over the next several years. Through its working groups CRU will engage with the market on the approaches and initiatives to raise customers' awareness of elements of the NEDS. The CRU will work with suppliers to understand what measures are needed to stimulate supplier product development, awareness raising and educational activities. The development of consumer offerings and timely engagement how contact with customers regarding demand flexibility initiatives ahead of products going live can be designed and timed for the greatest impact.

Increasing knowledge of the options and incentives available is also important for business customers. The Government, through for example DETE, provides a range of climate action supports and resources to help businesses on their journey to sustainability. Supports are also available to help mitigate the impact of energy price rises. The Climate Toolkit 4 Business allows SMEs to input some simple information to get an estimate of their carbon footprint. It will use this information to generate a personalised action plan and recommend those supports that are relevant to help each business reduce their carbon footprint and energy costs. There is also the SEAI Energy Academy, a free, online, e-learning platform designed to help businesses increase their energy efficiency and reduce their energy related costs. The SEAI Energy Academy allows anyone to learn with short, interactive, animated modules. It is mobile friendly and offers flexible, self-paced learning with access available 24/7. As they are established and embedded, the incentives and markets for distribution flexibility can be integrated into this tool and platform to enable the relevant benefits to be spread across the businesses who are seeking help with their decarbonisation journey.

In November 2023, ESBN launched 'Beat the Peak Business'[29] which is a scheme tailored to commercial electricity customers and energy management companies, such as aggregators, who can provide flexible capacity to the distribution network. Participants in the scheme are compensated for reducing their consumption during two events, Daily Events (Monday through Friday, excluding public holidays, 4:30 PM to 7:30 PM) or Peak Events, which occur during the same time but are not pre-determined. Peak events are periods in which ESBN require a greater level of flexibility and thus participants are incentivised through a higher payment for their capacity. This scheme incentivises commercial users to reduce their electricity consumption, potentially resulting in lower bills whilst simultaneously providing an additional revenue stream.

As with domestic customers, communication and education about ToU and dynamic tariffs, and other incentives and products for flexible demand, is also critical to getting engagement with the market for business customers. Targeted business advertising could enable uptake in this cohort, as could the design of specific products or services for the relevant connection type or demand profile. In addition to advertising, it will be critical that the agencies who directly support businesses, including the IDA, Enterprise Ireland and the SEAI are equipped to provide companies with the information and opportunities to participate in emerging schemes, for example flexible connections, flexible demand products, smart services and ToU offerings. The CRU would support non-domestic ToU and dynamic tariffs, flexible connections, and

[29] ESBN Beat the Peak Business

flexible demand products, being promoted directly to the relevant market segment. Further to this, the CRU is and will be increasingly supportive of suppliers conducting market testing and research to enable tariffs most suited to businesses' demand profiles to be developed.

Consultation question:

10) Do you have any views on the approach to Area 1: Smart Services, developed to increase customer engagement and participation in support of the NEDS?

A number of supplementary questions are provided below that respondents may wish to consider when answering the above consultation question.

a) Are the initiatives that the NEDS is engaged in and planning for its future programme sufficient to support customer participation and deliver increased flexibility?
b) Do you have any view on what measures the NEDS should prioritise in order to deliver greater flexibility and why?
c) Are there other areas or measures that the NEDS should consider in addition to those outlined above?
d) Are there any additional measures that should be implemented by NEDS stakeholders (Government departments, SOs, and State Agencies) to contribute towards the goals of the NEDS?
e) Are there other measures which the NEDS should consider around enabling greater business participation in demand flexibility?

4. Area 2: Demand Flexibility & Response

This chapter explores how to develop incentives to encourage larger energy users and specific sectors to participate in new markets for flexibility and respond to market signals. It discusses how providing appropriate incentives, market-based mechanisms, and real-time information can accelerate the expansion of flexibility, particularly non-fossil flexibility, on the Irish electricity system to support capacity, grid stability and reduce carbon emissions. The figure below provides an overview of this focus area and the associated key activities.

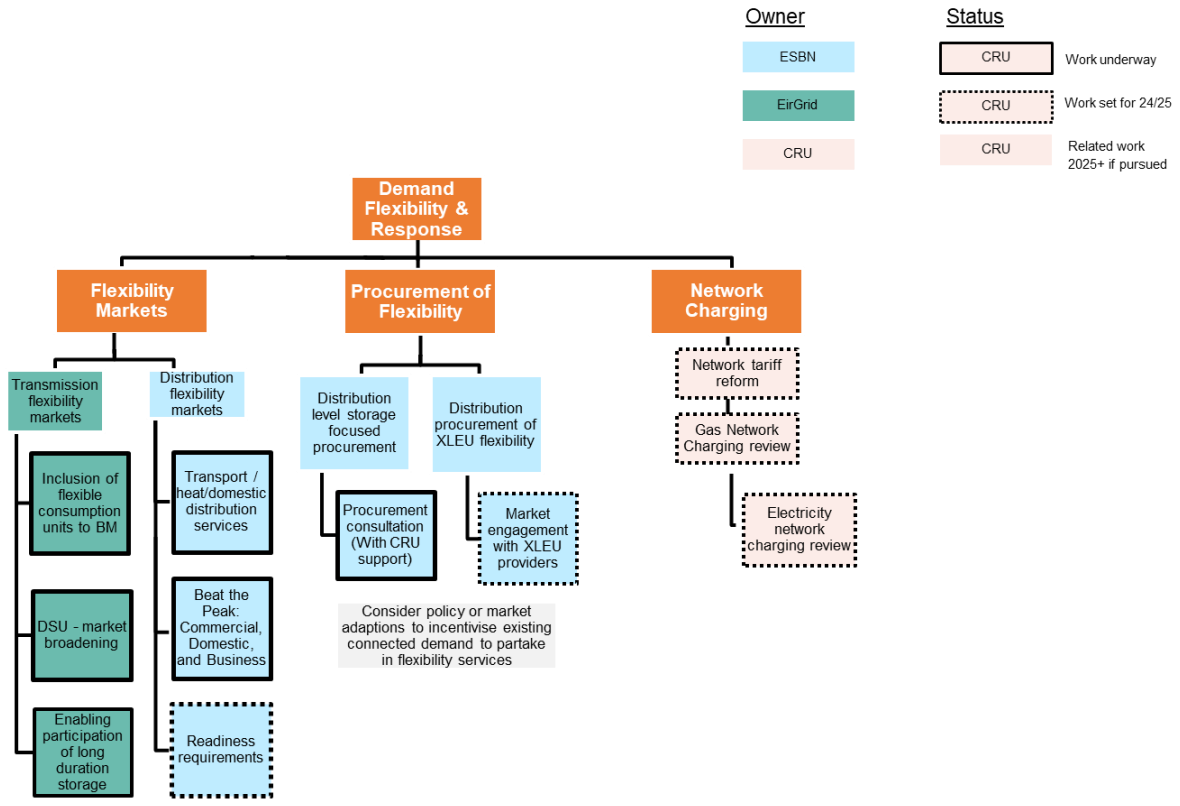


Figure 6: An overview of focus Area 2 and the associated key activities

4.1 The role of large energy users

LEUs and extra-large energy users (XLEUs) account for 27% of demand for electricity in Ireland with 18% of electricity demand coming from data centres alone in 2022, a 31% increase on 2021.[30] EirGrid expects that data centres could contribute 28% of Irish electricity

[30] Central Statistics Office, Data Centres Metered Electricity Consumption 2022

demand by 2031 and this assumes no additional data centres above what is already contracted (for the median scenario).[31] As LEUs and XLEUs will contribute significantly towards demand, with implications for system investment, it is important to explore opportunities for this sector to contribute greater levels of flexibility. For the purpose of this consultation and informed by views conveyed to CRU from stakeholders through the Review of Large Energy Users Connection Policy Call for Evidence, XLEUs and LEUs are defined on the basis of DUoS Groups: XLEU as DG10 and Transmission connected, and LEU as DG7 – DG9 in addition to XLEU groups.

The focus of this chapter, LEUs, comprises a wide range of businesses using energy across applications and technologies including computing, manufacturing and industrial processes, in addition to users across the public sector. The industrial and manufacturing sector also have their own CAP23 targets, with electrification of manufacturing processes and energy efficiency measures (to achieve demand reduction) as key elements to achieve these targets. These additional targets create both greater opportunities and greater imperatives for flexible demand.

For example, the electrification of industrial heating or manufacturing processes will drive demand increases, requiring network capacity and generation capacity. Absent flexible connections or flexible demand incentives targeted at these demand increases, this could increase the underlying challenges associated with CAP23 electricity targets. However, these new electricity demand offer greater opportunities for "flexibility by design", provided there is the right engagement between the relevant industries, State Agencies (IDA, Enterprise Ireland, SEAI), SOs and CRU at the point of technology adoption, and the right regulatory and incentive frameworks in place.

The CRU will account for these sector targets in the design and implementation of proposals in this chapter.

4.2 INCENTIVISING IMPLICIT FLEXIBILITY

In Chapter 2 of this paper, three broad mechanisms by which demand flexibility can be enabled were discussed. The first, implicit flexibility, is focused on providing incentives or supporting regulations to achieve demand reduction or shifting. In this section several measures to support flexibility implicitly are considered in relation to LEUs. Subsequently, details of proposals are provided to support explicit flexibility through development of markets and procurement.

The 'Review of Large Energy Users' Connection Policy' Call for Evidence was published as part of the EDS Call for Evidence package. This sought views from stakeholders on options for achieving net zero emissions at time of connection for LEUs. Chapter 5 focuses on

[31] EirGrid_SONI_Ireland_Capacity_Outlook_2022-2031

managing new demand connections, but it is important to note that policy suggestions in that Area will affect the delivery of implicit flexibility from LEUs.

4.2.1 Real-time carbon intensity information

The NEDS seeks to ensure relevant data for generation, demand and network constraints is available to system users to promote transparency between energy use and real-time emissions, which will in turn contribute towards incentivising flexibility. As Ireland pursues emissions reduction targets, information is required to understand the emissions associated with electricity generation on the system. Some preliminary steps have been taken to begin to build public awareness of this. For example, the Smart Grid Dashboard is an EirGrid web-based application that enables users to view and compare some of the key power system statistics including demand, generation and carbon intensity on a 15-minute or 30-minute basis so that businesses can accurately report the impact of their usage and invest in flexibility or storage to reduce it.

Similarly, ESB Networks has developed the "Is this a good time" flexible demand product to provide participants with localised "energy forecasts" identifying when their local supply of electricity will be higher or lower carbon intensity. Participants are provided with in-day or day-ahead notification of when for example local wind or solar generation will be high, and offers suggestions for demand shifting, and financial incentives to those customers who take demand shifting actions The CRU will work with EirGrid and ESBN to explore and implement potential enhancements to the information available and draw on examples from other countries.

One application for such information could be carbon intelligent computing, particularly in data centres, capable of reducing its energy consumption or matching its demand with times of high renewable generation could play a role in enhancing flexibility. Certain data centres in Ireland are already looking to match their demands on a 24/7 basis with clean energy by shifting their computing load to times when there is high volume of renewables on the grid (SFI Research Centre for Energy, 2021).[32] Data centres and other LEUs can shift their processes to different extents depending on how they operate and the level of flexibility on timing for their processes. The potential of data science and artificial intelligence by technology and energy companies for energy efficiency and flexibility applications is growing, with the potential to reduce business costs and carbon emissions. It is imperative that the right market mechanisms and SO support (including provision of information and forecasts) are made available to incentivise investment and adoption.

CAP23 also requires EirGrid to monitor and report on the emissions related to TSO dispatch actions and ESBN to implement a framework, currently in development, for measuring and reporting localised emissions. This information can inform the NEDS in assessing options to decarbonise the system and deliver flexibility. CAP23 also called for more granular certification processes, including 'time stamped' Guarantees of Origin (GO), so that energy intensive users

[32] Google clean energy progress in Ireland

can demonstrate that they are using zero emissions electricity during the same hour and geographical location to match all their consumption over the course of a day.[33] In the short term, ESBN is ensuring that its flexible demand contracts require matching in terms of geography and/or time where GOs are the mechanism for guaranteeing that the source of demand flexibility is low or no carbon. In the longer term, SEMO is the nominated Issuing Body for electricity GOs in Ireland and the CRU will work with SEMO to progress options for more detailed certification

4.2.2 The role of biomethane

One potential source of flexibility is incentivising clean energy shifting across energy vectors. For example, enabling energy users to shift from using electricity from the grid to the use of onsite power generation fueled by renewable gas. Green gas, such as biomethane derived from biogas, can be fed into the grid to reduce carbon emissions associated with gas consumption. Biogas and biomethane have the potential to be carbon neutral renewable fuels which help abate emissions across the whole value chain, where gas used by an electricity user to provide flexible demand is matched by biogas injections. CAP23 contained targets for biomethane, including production of 1 TWh of biomethane by 2025 increasing to 5.7 TWh of biomethane by 2030. The use of these renewable gases can help achieve climate targets through the reduction of emissions in multiple sectors including buildings, industry, transport, and agriculture.

The CRU recognises the ambition for scaling up the production and use of biogas across Ireland's energy system to enable broad decarbonisation, and the importance of fuels such as biogas in enabling the transition for high temperature processing, for example. However, the CRU is conscious of the potential for perverse incentives to create excess waste for the purpose of creating biogas. As such, it is important that the development of flexible demand products and connections policies is coordinated, with measures to ensure that the biofuels used for flexible demand are generated in alignment with the national biomethane strategy and relevant policies. For some end-uses it may be preferred to electrify where possible and rely on low-carbon electricity sources such as wind and solar.

The CRU will work with DECC, DETE and wider industry to further determine the role of biomethane in providing demand flexibility with consideration for the Government's forthcoming Biomethane strategy. The CRU will then consult on the treatment of biomethane generation in mechanisms to procure and contract flexibility and in incentives for implicit flexibility in cooperation with ESBN, EirGrid and GNI.

4.2.3 Electric road transport flexibility

The Irish National Electric Vehicles Charging Infrastructure Strategy 2022-2025 published in January 2023 will see €100 million spent on public charging infrastructure in Ireland over the next three years.[34] The strategy has ambitions to enable greater and more effective

[33] Government of Ireland, Climate Action Plan 2023, Section 12.1.3 *The Scale of the Challenge*
[34] Department of Transport – Electric Vehicles Charging Infrastructure Strategy 2022-2025

deployment of electric vehicle chargers. In general, where uptake of EVs is concentrated in an area, or where commercial operators put in place charging facilities, reinforcement of the network will be required if the load is not managed. To enable the transport sector to mitigate this impact, ESBN are designing flexibility readiness requirements and proposals for flexible demand connections, and aim to submit these to CRU for adoption from 2024 onwards. The flexibility readiness requirements will include the technical specifications and communications protocols that will be followed when installing EV charging points to facilitate high levels of flexibility. As discussed in Chapter 3, these flexibility requirements will be assessed and approved by CRU. Further to this, as part of their NNLC Programme, ESBN are designing products and services to incentivise the transport sector to partake in flexibility services. There is the potential to unlock significant flexibility from optimisation and aggregation of EV charging points.[35] The CRU will be working with ESBN to develop and approve these products and services and ensure the delivery of them is fair and effective in enabling demand flexibility. The CRU will also provide direction and oversight to ESBN and aggregators to optimise EV fleet charging through technology and software solutions. Additionally, the CRU will develop and consider options for the funding of smart charging and V2G projects.

4.2.4 Electricity network charging

Electricity network tariffs recover the costs of developing, operating and maintaining the transmission and distribution networks from the users of the electricity networks. Network costs are one of four components alongside wholesale costs, supply costs, and taxes and levies, that constitute an electricity consumer's overall electricity bill. Combined network costs make up between approximately one-quarter and one-third of the standard domestic electricity bill, with one-third of these costs broadly coming from transmission network costs and two-thirds coming from distribution network costs.

Over the course of the last 20 years the use of the electricity networks, and the demands placed upon them, have changed dramatically, and the pace of change is accelerating. In contrast to these changes and challenges, there have been no major changes to the structure of electricity network tariffs that the electricity network companies levy for the use of their networks since 2000. The 2021 Electricity Network Tariff Structure Review Call for Evidence Paper commenced a programme of work that the CRU is undertaking to review the structure of these network tariffs to ensure they are in the best interest of consumers, are fit-for-purpose for the modern evolving electricity networks and help facilitate the transition to a low carbon future.

How network tariffs are structured, the accuracy with which they reflect actual cost causation, and their interaction with other flexibility incentives (such as wholesale, balancing and flexibility market signals) can directly influence how generators and demand customers use the networks. This in turn has the potential to impact system stability; system investment needs;

[35] The value of electric vehicle charging flexibility, Baringa, 2022

the location of new generation and demand; the efficiency of electricity use; and equity across network users.

The CRU will build on the 2021 Electricity Network Tariff Structure Review Call for Evidence, and will consider consulting on options for short-term and longer-term reform to ensure that the tariff methodology incentivises the delivery and use of flexible capacity and services, optimising the existing grid and supporting development of a smart grid. Our approach will account for the interactions between implicit flexibility signals from network charging arrangements and explicit enablers of flexibility which are in place or may be implemented in future.

4.3 MARKETS FOR FLEXIBILITY

The wholesale electricity market design, including the Capacity Market and the DS3 Programme have enabled LEUs to participate in electricity markets and contribute to system management. EirGrid and the System Operator for Northern Ireland (SONI) procure approximately 775MW of flexible capacity from DSUs where demand sites respond to dispatch signals from the TSO.[36]ESBN have piloted options to secure flexibility from LEUs to meet distribution system objectives, and are growing participation through the development of more targeted products over the coming period. EirGrid and ESBN have recently jointly developed a TSO-DSO Operating Model. As this is implemented, it can help to ensure the TSO and DSO are aligned on the operation and dispatch of flexibility, and increase the potential for market participation and stacking of revenues. The CRU will provide oversight of the interaction of flexibility enabled through ESBN initiatives and the wider DSU programme overseen by EirGrid to ensure a whole of system approach.

Flexibility is becoming increasingly important to ESBN and EirGrid's long-term planning and real-time operations with ESBN officially launching flexibility product markets in 2021. ESBN's exploration of flexibility markets is evidenced by their initial local flexibility markets in Dublin central, Dublin north, Carlow and Wicklow, and the subsequent Pilot of Scale in Mullingar where domestic and commercial customers are being engaged in providing flexibility services, altering their consumption or generation profile to support the network. ESBN are seeking to expand local flexibility markets such that a full range of electricity customers will be able to participate and will be rewarded for shifting their demand whilst benefitting the overall system. ESBN has already taken steps to integrate flexibility into their portfolio through the NNLC programme which has incentivised and signalled to the market the need for flexibility services to meet national targets and electricity distribution network requirements. The NNLC programme will continue until 2030 to further establish flexibility and demand side management.

The CRU is currently engaging with ESBN on developing market-based mechanisms to procure flexibility services from different types of market participants including storage owners,

[36] All-Island Generation Capacity Statement 2022-2031, Table 3.9 - Ireland and Northern Ireland DSU Capacity

aggregators, and LEUs. The CRU has published for consultation, ESBN's on their procurement approach for flexibility services with a potential capacity of up to 500MW across approximately 10 locations. This procurement has a primary focus on distribution system operation to efficiently manage network congestion in areas with high renewable penetration or high demand.

In October 2023 EirGrid published a Call for Evidence on the Market Procurement Options for Long Duration Energy Storage (LDES)[37] which sets out options for supporting delivery of flexibility in Ireland for transmission connected storage. On the transmission level, there is currently 500MW of short duration storage participating in system services markets overseen by EirGrid and it will play a role in potential future procurement of storage and flexibility services and flexibility market developments. EirGrid also manages and facilitates flexibility through engagement with DSUs who participate in the Capacity Market and System Services arrangements. On successfully clearing the auction and meeting development milestones, these participants receive a capacity payment and take on an obligation to provide this capacity through their trading in the energy markets and availability. The role for procurement in the strategy to secure investment is discussed later in this chapter.

4.3.1 Broadening Demand Side Unit participation

Current mechanisms for rewarding demand flexibility include participation as a DSU in the SEM Capacity Market, DS3 ancillary services, and constraint payments in the wholesale electricity market.

Responses to the Call for Evidence highlighted that there are currently minimal benefits available for those smaller loads from transport, business or industrial sources, which cannot participate as DSUs, or do not deem the rewards great enough for the perceived effort. The CRU recognises the potential benefits from improving the clarity and ease of the route to market for such loads. In the short-term, sector specific products and services may be the quickest route to securing large volumes of flexibility.

The CRU is mindful that a Framework Guideline on Demand Response was published in December 2022, and that a Network Code on Demand Response is currently being drafted at EU level. When this Network Code is finalised the CRU will engage with EirGrid and ESBN regarding how to enhance access and participation in DSUs such that smaller loads from transport, business and industrial sources can provide and benefit from flexibility. The CRU will also consider the minimum and maximum demand reduction capacities for participation as a DSU and the license requirements for DSU aggregators.

4.3.2 Flexibility in the wholesale market

Several jurisdictions around the world are developing and trialling new mechanisms to improve market access for demand flexibility including EU Member States, Australia,[38] and the United

[37] EirGrid: A Call for Evidence on the Market Procurement Options for Long Duration Energy Storage (LDES)
[38] Australian Energy Market Operator – Wholesale Electricity Market Statement August 2023

States[39]. Progress has been centered around enabling customers to turn down demand and ensuring that storage assets can participate in the wholesale market. Belgium was among the first European countries to establish a regulatory framework suitable for demand side flexibility. Demand response can participate in the Belgian wholesale electricity markets as well as the balancing market, and can be represented individually or via aggregators.[40]

The gas and electricity markets regulator in Great Britain, Ofgem, is seeking to increase the number of energy market participants offering flexibility services through a modification to Britain's Balancing and Settlement code. 'Virtual Lead' parties that work on behalf of electricity generators and consumers will be able to offer flexibility services to the wholesale electricity market, where previously they were only allowed to offer the service via the balancing market.

Demand response programs are very sensitive to change and a changing market environment can discourage demand to actively participate in power system operations. In the Pennsylvania-New Jersey-Maryland (PJM) market, for example, changing rules for the remuneration scheme and prequalification tests were identified as a factor for participation being low relative to the overall capability that had been registered and approved to participate.[41]

The CRU will collaborate with the TSOs and work with the SEMC to consider solutions that could enable energy market participants to offer increased flexibility through the wholesale market. The CRU will work closely with stakeholders to understand the potential impacts as well as allowing for input and scrutiny of plans for implementation.

4.3.3 Dispatch of upwards demand response in the balancing market

Upwards demand response exists as a non-balancing market service in a number of systems to encourage LEUs and generators to either increase demand (through shifting) or reduce generation when there is excess energy on the system. Approaches for reducing generation when there is excess energy on the system exist currently through the Demand Side Unit mechanisms. EirGrid has worked recently on proposals for "dispatchable demand" where upwards demand response through an increase in on-site energy consumption could be instructed by the TSO. Currently, mechanisms do not exist to enable this in the Trading and Settlement Code, Grid Code, or market systems. The existing Demand Side Unit mechanisms could enable participants to trade in the ex-ante energy markets in a manner to support demand turned up, but it is not currently possible to make the option to turn up demand available for the TSO to dispatch.

EirGrid will consider the extent to which code and system changes could be made to better accommodate these "dispatchable demand" proposals in the future in exercises for scoping potential future market changes. The CRU will engage with the SEMC and SOs on the

[39] FERC Order No. 2222 – Facilitating Participation in Electricity Markets by Distributed Energy Resources
[40] Belgian Energy Ministry. Belgian Electricity Market, Implementation Plan; Belgian Energy Ministry: Brussels, Belgium, 2019
[41] Demand Response Participation Grows in PJM Interconnect

potential development of a technical solution and code modifications required to enable upwards demand response in the Balancing Market to ascertain the implications on the NEDS.

4.3.4 Distribution level flexibility

Markets should be designed to incorporate the unique capabilities of various LEUs and sectors whilst ensuring transparent, effective and non-discriminatory market-based participation. The CRU is involved in the design of these markets and will ultimately approve the delivery of the relevant products and services.

To meet the near-term demand flexibility target ESBN will be launching calls to competition – with (initially bespoke) congestion management and carbon abatement products to secure material MW volumes of demand response, with LEUs making substantial operational and investment decisions which enable them to shift large proportions of their site demands for multi-hour durations. These calls to competition, likely to be launched in 2024, are being designed with guidance from CRU and informed by market engagement. The investments could include process shifting, behind the meter electricity storage and behind the meter gas generation matched by domestic green gas production. LEUs could call on these resources to respond to signals sent by the DSO to manage distribution level constraints, based on monitoring and forecasting of local and regional electricity system conditions, and in coordination with the TSO. Whilst the initial calls to competition will be specific to LEUs, throughout 2024 and into 2025 there will be an accelerated focus on making these products and services targeting carbon abatement more readily accessible to a range of technologies and sectors. This expansion of the market beyond LEUs may build on the Beat the Peak commercial scheme. An informed, discovery led transition from focused product development to broader technology and sector agnostic arrangements may be needed to build a deep and competitive market.

4.3.5 Industrial and commercial heat

Industrial and commercial heat could also be a potential source of flexibility. This opportunity is accelerating as a result of other government policies and supports with regard to the electrification of heat. In addition to coming from thermal and operational process engineering to avail of flexible connections and flexible incentives, this could be in the form of thermal storage, where electricity is converted into heat and stored in a system which then uses it during peak hours. It could also come in the form of switching from gas heating to electric heating during times of high renewable generation. Demonstrator projects exist, and the Aughinish alumina refinery has recently engaged a 25MW electrode boiler in the wholesale electricity market with the potential to expand. However, absent new connection products and flexible demand incentives, there are currently barriers to the adoption of industrial heat flexibility at scale. Respondents to the EDS Call for Evidence acknowledged the role industrial heat can assume in promoting flexibility, particularly as the sector's plan for decarbonisation becomes increasingly focused on electrification. The CRU is of the view that this could form a significant contribution to the total level of demand flexibility in the future and will support activities to drive participation in the range of incentives and markets that are, or could be made, available.

When industrial heat flexibility is available from LEUs, these LEUs could increasingly participate in local flexibility markets or LEU focused flexibility procurement. Additionally, it could facilitate flexible connections for LEUs and XLEUs. The CRU will work with ESBN to develop a route to market for an industrial heat product for launch in 2024.

4.3.6 Developing new power products

Demand flexibility could be enabled by the introduction of new structured power purchase products for high flexibility electricity demand. This could enable, for example, surplus electricity at times of high renewable generation to be purchased at lower prices by industrial sites where they have the flexibility to substitute network electricity for other sources of power (e.g. energy storage, gas, onsite generation, etc.) for part of their demand.

Clear regulatory and price signalling to ensure the market rewards activities that have a broad system benefit is key to unlocking the required responses. Certification of the additionality of Corporate Power Purchase Agreements (CPPAs) and renewable gas could further unlock decarbonisation and flexibility enabling investments. Certification could demonstrate, for example, that the delivery of low carbon energy would not have occurred in the absence of the incentive created by the CPPA or renewable gas purchase offtake agreement.

The CRU will explore the potential offered by new structured power products in the market and will review options for certification of additionality for power and renewable gas.

Consultation questions:

11) Can the items proposed for Area 2: Demand Flexibility & Response, as outlined, provide appropriate incentives to improve flexibility, particularly non-fossil fuel flexibility, across the relevant target sectors (i.e. larger business and industrial users, and the transport and public sectors)?
12) Are there additional mechanisms to facilitate demand flexibility that should be considered as part of the NEDS?
13) Do you have views on whether incentives are the best mechanisms to accelerate the delivery of flexibility or if mandatory measures could be more effective?

4.4 Unlocking investment

In subsequent sections, the importance of investment to deliver flexibility in Ireland is considered. Firstly, the role of the CRU in coordinating and supporting the development of flexibility markets and services is discussed, thereafter the procurement exercises being developed by ESBN and EirGrid are reviewed alongside the principles of a robust flexibility procurement plan.

4.5 INVESTMENT TO DELIVER A LOW CARBON AND FLEXIBLE SYSTEM

While key elements of the NEDS are concerned with supporting behaviour change and improving incentives for demand flexibility, the success of the strategy will also depend on investment in developing sources of flexibility. Over the next decade, significant growth in electricity demand, driven primarily by the electrification of heat and transport, and growth in data centres is expected[42]. This will be coupled with the rise of renewable, and distributed, generation and storage. The CRU is responsible for regulating the SOs that manage the transmission and distribution network, ensuring effective management as the system transitions to a low carbon future. Accommodating these changes requires substantial additional investment in network capacity. It will also require greater investment in flexible and smart solutions to manage and facilitate demand. This strategy will assess and take action to balance both explicit and implicit market-based solutions which incentivise customers to utilise available network capacity and generation efficiently, with traditional network and generation investment that results in the lowest costs for customers overall.

There is, however, uncertainty over both the timing of increased demand from heat and transport and the cost of potential flexible solutions. The CRU seeks to foster and develop flexibility markets so that lowest cost solutions can compete and be rewarded in line with the benefits they offer. The CRU has a responsibility for developing these markets and aligning incentives for market participants with system needs and decarbonisation ambitions.

Historically, flexibility has been provided through the energy market, where arrangements incentivise supply and demand balancing on a half-hourly basis according to agreements to provide or consume energy. Recently, there has been significant growth in the value and importance of other supplementary markets and signals including System Services and local solutions for flexibility – that complement the energy market. These 'flexibility markets' ensure that additional needs are met including the real-time balancing needs of the system, management of network capacity, and other requirements such as those relating to system stability. Measures to support the integration of flexibility in markets are discussed in more detail in previous sections.

In addition to specific markets, the electricity system includes several mechanisms that send investment signals (such as the Renewable Electricity Support Scheme), a carbon price which incentivises lower carbon solutions, and various mechanisms for passing the costs of the system back through to system users (such as network tariffs). All of these can influence development of low-carbon flexibility. Successful policies to achieve this investment have in common the ability to provide a steady, stable and predictable framework for investors.[43] The CRU will work with stakeholders across the system to build and deliver a NEDS that provides coherent and consistent investment signals.

[42] EirGrid – Shaping our electricity future

[43] UK Energy Research Centre, Transition Risk: Investment signals in a decarbonising electricity system, 2023

Particularly in the early stages, the prospective wholesale market revenue and value from existing supplementary markets may not be able to support the investment case for some solutions, even when there is a wider value for money case to the system. Businesses also need confidence that their investments are aligned to agreed goals and that investments will be rewarded. Clear and consistent goals, transparent governance and greater revenue certainty can support the scaleup of investment needed to realise a more decentralised and digitalised energy system. The energy system is becoming considerably more complex. Industry and wider actors understand the need for change, but the scale of investment needed is significant and the landscape is changing.

By supporting routes to market for flexible solutions, the CRU can enable flexibility investments which deliver system value. The CRU may also have a role to play in securing or underwriting investment on behalf of customers to meet network needs, where this creates a positive spillover effect, supports competition and benefits consumers in the long term.

4.6 Coordinating and supporting investment in flexibility

The experience of EirGrid and ESBN in building competitive energy markets through market readiness trials will provide a foundation for future flexibility markets. A whole system approach with a collaborative partnership between EirGrid, ESBN, and CRU at its core will be key to unlocking and driving the necessary investment in, and integration of, flexibility to meet the CAP23 targets. EirGrid and ESBN submitted their joint SO workplan to CRU in 2021 and launched a consultation to integrate wider stakeholder feedback, and have since published updated multi-year plans annually44. The CRU will continue coordinating and engaging on DSO-TSO collaboration to support flexibility investment and market development that and will continue to monitor progression of the workplan.

CRU recognises its role in coordinating the procurement of flexibility alongside the DSO and TSO to support the development of competitive flexibility offerings in the market. The structure of any procurement will determine how these assets operate in the market and will also be important in signalling ambition for the level of investment from providers. Subject to the strength of the value for money case, the underwriting of flexibility services in the market could provide the necessary levels of security to unlock investment and ensure that flexibility can be utilised on the system where it is needed most. The DSO's case for flexibility services and storage comprises managing system security, decarbonising electricity, and providing low-cost energy to customers in the future. The CRU will work with ESBN on the development of a range of mechanisms to support and stimulate accelerated investment and product innovation from 2024 onwards.

[44] The latest 2024-28 plan can be viewed here: **DSO/TSO Multi-Year Plan 2024 - 2028**

ESBN flexibility procurement

The CRU has published for consultation on ESBN's proposal for a procurement of up to 500MW of flexibility, potentially including, but not limited to, short (1-4 hours), medium (4-12 hours) and long duration (over 12 hours) batteries, where there is an increasing need for a route to market in Ireland. When fully energised, this storage can contribute to the flexibility targets set out in the CAP and longer-term decarbonisation. The contracting of this procurement will involve storage developers and flexibility owners providing a certain level of flexibility on the distribution level following a signal from ESBN to increase/reduce demand or increase generation based on certain system conditions.

Procured flexibility could act as a solution by storing surplus renewable generation and discharging during times of peak demand or shifting demand away from peak periods. When the network faces constraints such as a surge in demand, storage serves as a solution to alleviate these issues. Congestion on the network is increasing due to the electrification of heat and transport as well as growth in LEUs which poses challenges regarding supply disruptions and the ability to connect additional load to the system. Flexibility would allow for the growing demand in Ireland to be met with the coinciding growth in renewable generation that would otherwise be dispatched down, driving material improvements for carbon abatement and system security. Flexibility can further strengthen security of supply by tapping into firm, reliable capacity when needed on the system, particularly when faults or emergency situations arise. The long-term use of storage could also deliver value for money for consumers across Ireland by reducing constraints payments, mitigating the dispatch of high carbon and costly fuel sources during peak times, and enabling use of lower cost network solutions.

However, there is a trade-off between speed of delivering flexibility and testing the procurement design, factoring in opportunities for learning. The cost of the procurement will ultimately be borne by customers and therefore it is critical that the procurement represents strong value for money. This will depend on how procured assets are utilised and the development of system demand and generation across the targeted locations. 500 MW is a significant volume to be procured over a short timeframe and is the largest tender on the distribution level in Ireland to-date. The scale, pace, and product design entail risks that will need to be considered and managed.

Whilst the intention is to have the associated storage energised by the end of 2026, the procurement and go-live date of the flexibility services could be phased into different batches. The cost of this procurement could be recovered through DUoS (Distribution Use of System) charges if the procurement of flexibility is approached as an alternative to distribution network reinforcement investments. An outline of the parameters being considered in ESBN's storage procurement approach, which ESBN intends to consult on separately, are summarised in the following table.

Table 6 - Overview of initial key design parameters for ESBN's flexibility procurement

Parameter	Proposed approach
Location	Determined based on needs at a specific location on the network, for instance in areas with high renewable energy generation such as the northwest, southwest and southeast or in areas where constraints are particularly concentrated, such as Dublin and the Greater Dublin area.
Contract duration	This will vary based on the service provider's market position. For existing providers, the contract may be shorter (e.g. 1 year) whereas for new providers a multiyear contract (e.g. 7-15 years) may be offered to provide a level of revenue certainty and a viable route to market.
Technology	Providers will be judged based on their ability to meet ESBN's technical requirements (i.e. volume, duration, emissions limit, energisation date, location etc.) with expectation that battery storage will be a major participating technology.
Revenue level and structure	Revenues for providers paid mainly in the form of availability payments (utilisation payments under consideration) with associated penalties for lack of energisation or failure to delivery on contracted agreements.
Revenue stacking	When possible, providers will be able to stack flexibility revenues with other market services with a sharing factor to be implemented to encourage efficient market behaviour. Until then it is likely ESBN will provide developers with the majority of their project revenues.
Procurement approach	Initially a tender-based approach will be used with a multi-criteria assessment (not a price-only assessment) with a potential shift to an auction approach once market liquidity develops.
Scoring criteria	Based on the specifications of the tender, bids will be assessed under the multi-criteria (e.g. project's track record, duration of the asset, evidence of financeability etc.)

ESBN's procurement design process is ongoing with qualifying selection questionnaires (QSQ) and requests for tender (RFT) likely to be published Q1-Q2 2024. A consultation on ESBN's proposed procurement approach has been published in Q4 of 2023 and has been developed in coordination with the CRU.

4.6.1 LEU and demand flexibility services

As highlighted in previous sections, through introducing local or more bespoke flexibility products, ESBN could collaborate with LEUs to shift their demand towards periods of low carbon intensity for the system and away from times of peak system demand or high carbon intensity. ESBN is investigating contracting with LEUs to obtain, and support investment in, flexibility through use of behind-the-meter storage, green gas, or process shifting for carbon abatement and system management purposes.

The CRU will work with the SOs, and suppliers as appropriate, in the development of demand flexibility products for all cohorts of demand customers to incentivise flexibility and shifting demand to maximise use of renewable energy and contribute to system security and operations.

4.6.2 EirGrid flexibility procurement

There is a role for procurement of flexibility more broadly at the transmission level to manage system requirements including elements such as frequency regulation, capacity adequacy, supply and demand balance, and reduction of dispatch down of renewables for local constraints, system-wide curtailment, and surplus renewables. Long duration energy storage is also expected to play an increasing role in the future energy system as increasing generation capacity and demand places further constraints on the system. As the benefits of the short duration battery market are realised, there is scope for incentivising investment and procurement of other storage technologies, such as long duration batteries, which can shift larger amounts of energy. Therefore, it is important to consider whether there are any barriers to the entry of long duration energy storage into the market and to consider approaches to removing those barriers. For the full range of benefits of long duration storage it will be important that it can fully participate in all markets and efficiently revenue stack between those markets. The CRU will consider the government statement on storage when it is published and will consider the feedback from this consultation in setting out appropriate next steps.

4.7 Assessment Criteria for Procurement

With a view to 2030, investment in system flexibility will be pivotal to the success of the NEDS whether that be through storage, LEUs, or technologies, including domestic products that increase potential for flexibility. As the energy landscape continues to evolve, the management of the system needs to adapt. The CRU will continue to collaborate with stakeholders to assess system challenges to verify that the procurement of flexibility services is appropriate and justified, ensuring that markets are competitive and transparent to attract the investment needed.

Procurement programmes should aim to demonstrate the following but in certain circumstances, for example during initial or pilot phases, it may not be possible to meet all requirements.:

1. High confidence of supporting flexibility targets and carbon abatement objectives
2. Risk of overspend as low as reasonably possible
3. Stimulate market participation and enduring market based solutions
4. Efficient use of flexibility to address network and system flexibility requirements
5. Risk of future asset stranding minimised

6. Reasonable expectation of participation by a sufficient volume and diversity of flexibility providers

7. Approach that is adaptable for future procurement rounds, but balanced with the need for continuity and consistency

8. Non-discrimination in terms of participants that can meet well-justified technical or commercial eligibility criteria

Consultation questions:

14) What are your views on the approach to Area 2: Flexibility Demand & Response? Are there other options that should be considered?

A number of supplementary questions are provided below that respondents may wish to consider when answering the above consultation question.

a) Do you agree that the options for flexibility markets can deliver flexibility and represent good value for consumers?

b) What are your views on how the costs of this procurement should be recovered; is the DUoS charge an appropriate mechanism?

c) What are your views on the respective roles of procurement of flexibility at the transmission and distribution level?

d) How can further investment and participation in flexibility from LEUs be enabled?

e) Do you agree with the anticipated benefits, costs and risks from the procurement approach described?

Do you agree with the anticipated benefits, costs and risks from the procurement approach described?

5. Area 3: New demand connections

This chapter sets out the role of new demand connections, particularly LEUs, in building out demand flexibility in Ireland. It discusses the importance of incentivising new LEUs to provide flexibility as well as the interaction between the decarbonisation of energy demand, the gas network, and options for incentivising flexibility for non-LEU connections. The figure below provides an overview of this focus area and the associated key activities.

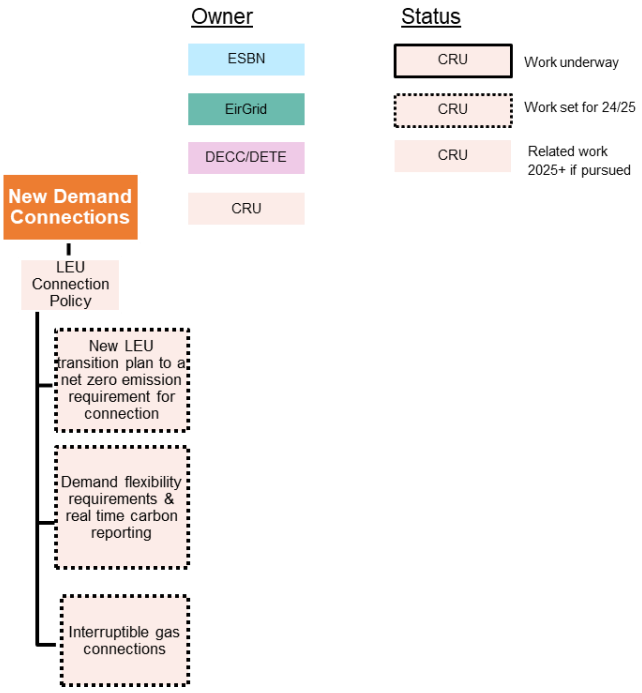


Figure 7: An overview of focus Area 3 and the associated key activities

5.1 The role of new demand connections

Chapter 1 identified conditions associated with electricity demand connections as one of the three broad approaches for delivering demand flexibility, all of which will have a role in the overall NEDS. Peak electricity demand in Ireland has been growing considerably over the last few years and this is leading to increasing pressures on the electricity system in Ireland. According to EirGrid's Winter Outlook, Loss of Load Expectation (LOLE) in Ireland rose to 51 hours in Winter 2022-23 before falling to 21 hours in Winter 2023-24 in the most recent report.[45] This remains outside the 8 hours per year standard.[46] There is an expectation that

[45] EirGrid Winter Outlook 2023/24

[46] Regulatory Authorities are engaging with DECC in Ireland and DfE in Northern Ireland to set a new Reliability Standard. See Calculation of a single Value of Lost Load within the SEM Information Paper SEM-23-072.pdf (semcommittee.com)

the system will enter the Alert State at times and a reasonable probability of entering the Emergency State, most likely at periods of low wind and low interconnector imports.

Data centres, which form part of the LEU flexibility opportunity and are generally XLEUS, are increasing their share of demand and are one of the drivers for the increase in peak demand.[47] Given the expected increase in demand from LEU's and XLEU's, the CRU is undertaking a separate consultation on options to reform the process for providing new grid connections to the electricity and gas systems.

The Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy sets out the policy aims of enabling the 'twin transitions' of digitalisation and decarbonisation of the Irish economy and society. To date, the Irish Government has set out certain principles to inform decisions on data centre developments and connections to the grid in the future. These principles, which apply to all new data centre developments, include preferences for data centres which can make efficient use of the electricity grid (using available capacity and alleviating constraints), developments that can demonstrate the additionality of their renewable energy use in Ireland and developments in locations where co-location with renewables or storage is available.

The CRU acknowledges the challenges that XLEUS pose in regard to the planning, cost, and operation of the electricity system, however, they play an important role in Ireland's economy through job creation and service provision. It is important to strike a balance between the societal and economic benefits of XLEUs to foster investment in Ireland, while also addressing the associated connection challenges in an efficient manner. In November 2021, CRU published a direction to the SOs related to Data Centre grid connection processing (CRU/21/124) which meant that, in assessing data centre applications, the SOs had to consider the ability of a potential connection to have onsite, dispatchable generation greater or equivalent to their demand and to be able to provide flexibility in their demand by reducing consumption when requested to do so. This goes some way to ensuring new connections have flexibility, though it currently applies to data centre applications only.

The CRU also recognises the importance of considering the connections regime for the gas network as part of the wider connections framework. Transformation of the electricity system will be accompanied by changes to the infrastructure and operation of the gas network as part of the transition to a low carbon future. The Price Control 5 Regulatory Framework (PC5) determines how much revenue the gas SO can collect in the five-year regulatory period. As the asset owner and SO of the Irish gas network, GNI, along with other entities, including those that set relevant strategies and implement pricing signals, can help to achieve Ireland's energy policy objectives.

The development of gas demand in Ireland raises question pertaining to depreciation, decommissioning and the future use of the gas network. It is imperative to acknowledge that such dynamics play a pivotal role in shaping price controls and these dynamics underpin some

[47] EirGrid_SONI_Ireland_Capacity_Outlook_2022-2031

of the PC5 decisions. In this overarching context, there is a responsibility on the CRU to provide GNI with a regulatory framework which is matched to these challenges, providing the requisite flexibility and incentives that will allow GNI to respond to the changing energy landscape expected over the coming decades. This will enable GNI to adapt as the pathway of decarbonisation continues to be further defined through market developments and national policies.

In its final decision on the PC5 Regulatory Framework, the CRU has introduced a flexibility and adaptability incentive. The objective of this incentive is for GNI to demonstrate how it has adopted a flexible and adaptive planning approach to system operation and network planning in delivering its PC5 investment plans, to best deliver on long-term energy system needs in the context of the uncertainty of supply and demand and other factors impacting the gas network. GNI will be required to produce a detailed planning document in alternating years with the NDP, the Core Flexibility Report (CFR), which demonstrates GNI's adoption of long-term adaptive scenario planning.

5.2 Review of new LEU connection policy to provide flexibility and support decarbonisation

As part of the broader NEDS, the CRU initiated a review of the processing of new large energy demand grid connections to the electricity and gas systems. On 21 June 2023, the CRU published a Call for Evidence on Review of Large Energy Users connection policy (CRU/202357)[48]. The consultation period for the Call for Evidence paper closed on 30 August 2023, with 44 responses received.

The Call for Evidence described how the introduction of SECs, setting out the total amount of permitted greenhouse gas emissions in each sector of the Irish economy during a specific time period, has put a new focus on electricity demand growth in Ireland. The paper noted the particular challenge the growth in LEU demand represents in relation to the SEC for the electricity sector, with the indicative target for the electricity sector representing a 75% reduction in emissions between 2018 and 2030. According to the EirGrid's GCS for 2022-2031, some of the largest growth over the next 10 years is projected to come from data centres and new technology loads. The paper described a number of measures available to facilitate decarbonisation of LEU energy demand and asked questions regarding these.

Following the Call for Evidence, the CRU is now developing a more detailed consultation, building upon the Call for Evidence and reflecting information and feedback received. It is anticipated that this subsequent consultation on Review of Large Energy Users Connection Policy will be published in January 2024, as part of the NEDS, with a decision to follow in 2024. The CRU expects this decision to outline the conditions for connecting LEUs to the gas

[48] CRU202357 Review of Large Energ Users Connection Policy Call for Evidence Paper.pdf (divio-media.com)

and electricity networks. There are a number of aspects that are being considered as part of this consultation:

- The aim of the Review is to provide a pathway for new LEU connections to the electricity and gas systems which minimises the impact on national carbon emissions and supports industry and others to decarbonise Ireland's economic growth.

- Due to the considerable interaction between gas and electricity networks, the CRU is cognisant that a coordinated approach is required for connections to the electricity and gas networks to ensure that policies introduced support reductions in national carbon emissions and enable industry and others to decarbonise Ireland's economic growth.

- As part of the Review, the CRU is considering criteria such as the requirement for a Corporate Power Purchase Agreement (CPPA) for renewable energy. The potential of moving to a requirement for real-time zero carbon demand is also being explored. In order to facilitate this, hourly emissions monitoring and reporting would be a key enabler.

- Flexibility requirements for new connections are also being explored. This can contribute towards the overall demand flexibility targets and support system security.

- Consideration is also being given to the role of onsite generation and storage, and how that can be delivered in a low or carbon neutral way (e.g. batteries, biomethane etc.).

The CRU Review of Large Energy User Connections is intended to identify barriers to full alignment between LEU connection approaches taken by SOs, and the 2015 Act and associated carbon budgets. It is expected that some of the requirements identified may fall outside the remit of the CRU and connection policy, and the CRU anticipates wider stakeholder engagement in relation to these. Whilst connections policy can address some aspects of the challenge, there are many other actors that can influence new demand such as environmental and planning authorities and enterprise agencies.

As noted above, publication of this consultation, as part of the NEDS, is expected in the coming weeks. Respondents are requested to respond directly to the Consultation on the Review of Large Energy Users Connection Policy with comments relating to this workstream.

5.3 Requirements for connections

Beyond connections policy for LEUs, there is the potential to support greater demand flexibility from new domestic and commercial connections. Connections policy, building standards and the planning regime could have a role to play in ensuring that technologies that can deliver low carbon flexibility are considered and deployed. For example, the Nearly Zero Energy Building standard (NZEB) has applied to all new buildings occupied from 2021. This required improvements in energy performance and insulation over and above the existing Building Regulations. In future, standards could be adopted to require installation of charging points for

electric vehicles in new domestic buildings or new non-residential buildings with parking spaces.

Consultation questions:

15) What other mandatory requirements could be considered as part of the NEDS?

- *These may be already identified but not currently part of the NEDS, or newly proposed mandatory requirements. They may also be associated with any of the relevant entities across the broad range of stakeholders contributing towards the design and implementation of the NEDS.*

6. Implementation Plan

This chapter details how the CRU will deliver the NEDS and support the build out of demand flexibility in Ireland. It discusses the delivery phases and components of the project and how the CRU and other responsible bodies will continue to collaborate with stakeholders across the system to deliver the NEDS.

6.1 Delivering the strategy

The CRU has made a commitment to coordinate design and delivery of a policy and market framework that delivers transformational change whilst driving a low carbon future. In the context of the NEDS, this involves engaging with Government departments, SOs and suppliers on the exploration of flexibility technologies, services and incentives that fundamentally benefit consumers, stimulate competitive markets and investment.

The Strategy will be delivered iteratively, and the CRU will be responsive to industry feedback and market developments in relation to the three mechanisms identified for supporting flexibility and decarbonisation: implicit flexibility, explicit flexibility and mandatory requirements.

The strategy will be delivered through research and testing to build evidence, consultation with stakeholders and coordination of delivery partners. The CRU will provide transparency on roadmaps and communicate with industry regularly on progress, review and adjusting priorities for implementation in line with the project objectives.

6.2 Delivery across phases of the strategy

Subject to revision as through learning-by-doing, our proposed plan for delivering the NEDS between now and 2030 is summarised below:

Phase 1	
Time period	2023 - Q1 2024
Key activities	• Energy Demand Strategy Call for Evidence • National Energy Demand Strategy Consultation • Review of responses to consultation and Decision on next steps for planning and development of workstreams for Phase 2
Key objectives	• Define energy demand strategy project scope and define roles for CRU and other actors in delivery of the NEDS. • Identify, progress and accelerate the initiatives, including those underway, that can contribute towards 15-20% demand flexibility by 2025 • Deliver a longer-term strategic plan for the NEDS project including definition of demand flexibility and the approach to measurement
Key decisions	• Definition of demand flexibility informed by stakeholder input • Implementation plan for Phase 2 initiatives • Approach to measurement of demand flexibility

Phase 2	
Time period	2024 – 2026
Key activities	• Consult, develop and implement Phase 2 initiatives • Collection of data, measurement and industry engagement to inform regular review/monitoring against objectives (e.g. 6-monthly), and Q1 2026 formal progress report
Key objectives	**Smart services:** • Increase penetration of smart meters to 2.4 million in line with CAP target • Increase uptake of ToU tariffs, the diversity of tariffs offered (e.g. Dynamic) over time and reduce barriers to consumer understanding of ToU offers (e.g. through enabling Data Access Code) (2024 onwards) • Increase uptake of renewable microgeneration towards 380 MW CAP target • Ensure market is enabled for V2G / smart charging / heat flexibility **Demand flexibility/flexibility procurement:** • Distribution flexibility market is set up for a greater volume of demand flexibility products (2024)

	• Distribution procurement rounds required to meet the 15-20% demand flexibility target have resulted in contracted capacity which is cost effective (2024-2025) • Transmission level markets are adapted to support greater demand flexibility, particularly non-fossil flexibility (2024-2025) • Existing demand in 2023 is incentivised to partake in markets (alongside and as part of procurement rounds and market development) **New demand connections:** • Demand flexibility requirements at point of connection established (2024-2025) • Establish and enable role for on-site generation and storage • Establish carbon accounting approach including data capture, verification and role of onsite emissions reporting devices
Key decisions	• The roles of the TSO/DSO for market development and procurement of flexibility, as well as connection policy, enabling them to contribute towards CAP objectives • Role of energy suppliers, consumers, aggregators and other third parties in Ireland – how can parties come together to enable more domestic and small business flexibility

Review of progress	
Time period	Q1 2026
Key activities	Official progress report from CRU (gathering data from across stakeholders) on 15-20% target for demand flexibility and the progress to date against the key objectives for each pillar
Key objectives	Check in on progress, take stock of successes and failures and where the objectives and relative contributions to flexibility across the system for Phase 3 may need to be adjusted.
Key decisions	Objectives for Phase 3 to enable CAP 2030 goals

Phase 3	
Time period	2026 – 2030
Key activities	Progressing Phase 3 initiatives Collection of data and industry engagement to inform regular review

Key objectives	Smart services: • Increase uptake of EV smart charging, V2G and V2H • Ensure market is enabled for Home Energy Management Systems, aggregation and energy sharing Demand flexibility / flexibility procurement • Distribution flexibility markets established with liquidity and competition. Transition in focus from procured flexibility with long-term contracts to market-based solutions.
Key decisions	Consideration of role and targets for demand flexibility post-2030.

6.3 Partnering to deliver the strategy

The CRU is responsible for leading the NEDS and its coordination and implementation. The CRU is committed to collaborating with Government departments, the SOs, and wider industry to successfully deliver the NEDS and its objectives. This consultation paper sets out a range of areas within which the CRU will take action and collaborate with partners. There are also a number of areas and activities that are being led, or where leadership and action will be needed in future, by other parties including ESBN, EirGrid, Government departments, suppliers and other market actors. These actions will be crucial to the delivery of the NEDS and to the realisation of its ambition.

Progressing and enhancing the effectiveness of elements of the NEDS may require supporting legislation and adjustments to the planning process to enable delivery of the required projects, technologies and business models. Government can review alignment between the objectives of the relevant public bodies to support the achievement of the national climate objective and carbon budgets. Continuation and development of supporting policy will also be key. For example, DECC's commitment to fund the retrofit of 500,000 homes to an energy rating of B2 and installation of 600,000 heat pumps will have significant implications for the NEDS and delivery of flexibility from domestic customers. Support to develop microgeneration amongst small businesses and domestic households through the Microgeneration Support Scheme could also increase the volume of demand flexibility available. The ongoing collaboration between DECC and the CRU on the NSMP will also ensure that a greater number of consumers can benefit and participate in demand flexibility services.

Energy suppliers will play a key role in empowering and engaging consumers in demand flexibility through the development of services such as smart tariffs. Suppliers' engagements and campaigns on the benefits of smart meters, smart services, ToU tariffs, and other enablers of demand flexibility will be key to the delivery of the NEDS given the central role of customers. The CRU is committed to collaborating with suppliers to ensure that demand flexibility initiatives are appealing to customers and can have a meaningful impact.

The CRU has also been closely monitoring engaging with EirGrid on their approach to using demand side response to deliver flexibility on the Irish system. The current and potential future approaches for demand side response participation is being considered within the TSO Demand Side Strategy, a joint initiative with SONI, which will intend to highlight the benefits of this flexibility as well as the challenges regarding its implementation. Its strategy is centred on using demand side flexibility to benefit the system in driving a decarbonised future through reducing demand peaks and troughs, efficient congestion management, integrating surplus renewables, lowering development barriers, and providing further security of supply. This is being developed in response to the CAP and other policies, recognising the impacts on DSO services and specific sectors. Such flexibility from demand side response can provide benefits to system management in relation to capacity adequacy, energy balancing, and reserve services. EirGrid is planning to launch a Call for Input (CfI) in Q1 of 2024 on its TSO Demand Side Strategy to gather stakeholder feedback, particularly on priority areas to meet the 2030 targets. The CRU will continue to engage with EirGrid on the publication of its CfI and on the role of its strategy within the broader NEDS.

ESBN is a key partner to provide the investment signals for delivery of flexibility and to ensure its effective operation. Procurement and development of markets on the distribution system could provide significant amounts of system flexibility whilst supporting them in their capacity as the DSO. How EirGrid and ESBN progress the TSO-DSO Operating Model will also be pertinent to the development of the NEDS in ensuring parties are fully aligned on the operation and dispatch of flexibility.

6.3.1 How the CRU will oversee and collaborate with the TSO and DSO

The CRU has set objectives for greater coordination between the DSO and TSO. These are related to the management of dispatch down and curtailment, addressing security of supply and constraints, adopting a whole system approach to optimise meeting the needs of customers and the system, and co-developing processes for the deployment of new technologies. Flexibility is being explored by the SOs as a solution to effective system management that would deliver on the CAP23 targets and the CRU's DSO-TSO objectives. The Joint System Operator programme (JSOP) was established in 2021 to ensure the SOs are working effectively to address electricity system needs. This has been progressing with collaboration between the TSO and DSO on elements such as ESBN's Beat the Peak offering to coordinate measures on system management. The CRU continues to engage on the JSOP through reviewing activities on future operating models, pilot developments, and technology integrations. The DSO/TSO work plan involves establishing and securing a power system that is future-fit and enabled by widespread demand side flexibility and the CRU continues to engage with the SOs on the delivery of flexibility in Ireland.

The CRU will continue to drive and coordinate collaboration between the TSO and DSO, including through the Price Review 6 (PR6) (2026-2030) process. Our engagements to-date have shown there are potential opportunities for greater synergy; for example, ESBN's procurement of flexibility in certain locations under long-duration contracts to resolve distribution constraints could also provide ancillary benefits on the transmission level. However, there are also elements in their strategies that overlap and require further discussion

as offerings and markets evolve, particularly in relation to the procurement of flexibility from LEUs which is relatively nascent.

6.4 Delivery in the context of uncertainty

There is uncertainty with how the future energy system will develop in relation to demand growth as well as the various pathways in which Ireland can decarbonise its energy. Ensuring that the NEDS and the CRU's approach is adaptable and flexible to this uncertainty will be critical to the delivery of the CAP23 targets and achieving NEDS objectives. However, certain trends in the Irish energy system have provided a vision of Ireland's future energy system and the CRU must be active in preparing and addressing the challenges this proposes. For instance, electrification and digitalisation are driving demand increases, particularly in relation to transport and commercial activities. Renewable generation capacity has increased significantly, and continues to rise, bringing challenges related to intermittent generation and network congestion. An energy system that is supported by increased levels of flexibility could mitigate some of the issues that could arise within the future energy system. This will require changes across the energy industry as flexibility becomes embedded in domestic and commercial energy use which will require fundamental shifts in SOs and energy suppliers' function and operations.

However, there are areas where the CRU is less certain of change and adaptability will be an important facet of the strategy to integrate flexibility into the Irish energy system. For instance, renewable hydrogen could play a role as a dispatchable zero-emission source of flexible electricity and long duration store, while also providing a route to decarbonise industrial processes and fuels in various sectors (Department of the Environment C. a., 2023). Innovation developments may reveal more cost-effective or optimal technologies for flexibility services, for example power CCUS (Carbon Capture, Use and Storage). How consumers engage with demand-side flexibility also may change with the development of new technologies and services which may prompt a shift in the strategy. Moreover, the pace and location at which energy demand is forecasted to develop may not materialise. Considering these uncertainties, the CRU will approach the implementation of the National Energy Demand Strategy in a manner that is adaptable and iterative, reviewing over time as progress is made towards integrating flexibility into the energy market.

Consultation questions:

16) Are the actions set out to deliver the NEDS consistent with the ambitions for 2025 and 2030?
17) Does the proposed approach to managing uncertainty around elements of future system decarbonisation provide flexibility while building confidence in the NEDS?
18) What supporting actions including, for example, delivery of enabling legislation, are required from actors other than the CRU to progress and enhance elements of the NEDS?

7. Consultation Questions

To support the consultation process and the development of the NEDS, the CRU has posed the following consultation questions that respondents may use as a basis for their review.

Question
1) Do you agree with the overall approach to the NEDS?
2) Do you agree with the sources of demand flexibility identified (storage, transport, domestic, industrial & LEUs, commercial)? Are there other sources of flexibility that could contribute to the demand flexibility targets?
3) Do you agree with the assessment of what cohorts and technologies are in scope for the demand flexibility target?
4) Do you have additions or modifications to offer on the summary of the key mechanisms through which market participants can provide flexibility?
5) Are there additional contributions (i.e. other actions or proposals) to the NEDS that should be considered from stakeholders such as Government departments, SOs and State Agencies?
6) Do you agree with the proposed clarifications for defining demand flexibility?
7) Do you support the proposed *Volume Shift* option for defining demand flexibility?
8) Are there additional considerations or clarifications required in defining demand flexibility?
9) Do you agree with the view of progress to date?
10) Do you have any views on the approach to Area 1: Smart Services, developed to increase customer engagement and participation in support of the NEDS? a) Are the initiatives that the NEDS is engaged in and planning for its future programme sufficient to support customer participation and deliver increased flexibility? b) Do you have any view on what measures the NEDS should prioritise in order to deliver greater flexibility and why?

c) Are there other areas or measures that the NEDS should consider in addition to those outlined above? d) Are there any additional measures that should be implemented by NEDS stakeholders (such as Government departments, SOs, and State Agencies) to contribute towards the goals of the NEDS? e) Are there any other measures which the NEDS should consider around enabling greater business participation in flexibility?
11) Can the items proposed for Area 2: Demand Flexibility & Response, as outlined, provide appropriate incentives to improve flexibility across the relevant target sectors (i.e. larger business and industrial users, and the transport and public sectors)?
12) Are there additional mechanisms to facilitate demand flexibility that should be considered as part of the NEDS?
13) Do you have views on whether incentives are the best mechanisms to accelerate the delivery of flexibility or if mandatory measures could be more effective?
14) What are your views on the approach to Area 2: Flexibility Demand & Response? Are there other options that should be considered? *a)* Do you agree that the options for flexibility markets can deliver flexibility and represent good value for consumers? *b)* What are *your views on how the costs of this procurement should be recovered; is the DUoS charge an appropriate mechanism?* *c)* What are *your views on the respective roles of procurement of flexibility at the transmission and distribution level?* *d)* How *can further investment and participation in flexibility from LEUs be enabled?* e) Do you agree with the anticipated benefits, costs and risks from the procurement approach described?
15) What other mandatory requirements could be considered as part of the NEDS? • *These may be already identified but not currently part of the NEDS, or newly proposed mandatory requirements. They may also be associated with any of the relevant entities across the broad range of stakeholders contributing towards the design and implementation of the NEDS.*
16) Are the actions set out to deliver the NEDS consistent with the ambitions for 2025 and 2030?

17) Does the proposed approach to managing uncertainty around elements of future system decarbonisation provide flexibility while building confidence in the NEDS?
18) What supporting actions including, for example, delivery of enabling legislation, are required from actors other than the CRU to progress and enhance elements of the NEDS?

8. Next steps

Following the end of the eight-week consultation period on Friday 16th February 2024, the CRU will review responses received and, taking this feedback into consideration, will commence drafting of the decision paper for the NEDS. It is intended for the decision to be published in Spring 2024.

The CRU intends to coordinate stakeholder workshops in Q1 of 2024 following the publication of the consultation paper to understand industry's views on the proposed measures and focus areas of the NEDS. Arrangements for these engagements will be shared in due course with stakeholders and will provide an important avenue for feedback to inform the development of the NEDS.

The CRU welcomes input from all interested parties on this consultation paper to be submitted via email by close of business on **Friday, 16th February 2024** to energydemandstrategy@cru.ie.

Unless marked confidential, all responses from companies or organisations may be fully published on the CRU's website and shared with the system operators for discussion. Respondents may request that their response is kept confidential. The CRU shall respect this request, subject to any obligations to disclose information. Respondents who wish to have their responses remain confidential should clearly mark the document to that effect and include the reasons for confidentiality.

Responses from identifiable members of the public will be anonymised prior to publication on the CRU website unless the respondent explicitly requests their personal details to be published. The CRU privacy notice sets out how we protect the privacy rights of individuals here[49].

[49] www.cru.ie/privacy-statement