Rialtas na hÉireann
Government of Ireland

Securing Ireland's Gas Supplies

Prepared by the Department of the Environment, Climate and Communications
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Part A: Context

1. Introduction

1.1 The purpose of this report is to assess potential risks to Ireland's natural gas security of supply, to review policy options that may enhance Ireland's security of gas supply and to present recommendations to the Minister and Government based on the policy proposals presented.

1.2 This report supports the Energy Security Package in respect of Actions 14 to 17. The Department has undertaken a comprehensive process to arrive at this report, which included but is not limited to:

(i) Carried out a consultation process with interested stakeholders and the public.

(ii) Preparation of a 'Technical Analysis of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems' carried out by CEPA.

(iii) CEPA have prepared a follow-up assessment 'Extent to which new gas infrastructure (either commercial or strategic) can help mitigate the impact of disruptions to pipeline imports of natural gas from Great Britain (GB)'.

(iv) This report does not seek to repeat the detailed analysis in the CEPA reports which should be read in conjunction with this report.

(v) The Department has also held a series of engagements with a range of stakeholders, including:

- The European Commission
- The International Energy Agency (IEA)
- The Commission for Regulation of Utilities (CRU)
- NewERA
- Gas Transmission System Operator, Gas Networks Ireland
- Project Developers
- NGOs
- Other Government Departments
- The National Cyber Security Centre

1.3 The report is structured in three Parts as follows:

The remaining sections of **Part A** outline Ireland's existing gas policy and the range of policies that will transition our gas system overtime (section 2 and 3).

Part B details the long-term approach to securing our gas supplies as part of Ireland's net zero emission future (section 4).

Part C considers and assesses the transitional measure required in the medium term as set out in sections 4 to 9.

Section 4 sets out the long-term plan for gas in Ireland.

Section 5 summarises the process and findings from the CEPA technical analysis commissioned by the Department.

Section 6 identifies and assesses key risks to Ireland's gas security of supply.

Section 7 considers the mitigation measures that may be needed to address the risks identified as unacceptable in section 6 of the report.

Section 8 considers in more detail the mitigation option that is considered to best meet the identified criteria, that is, the operation of a gas emergency reserve.

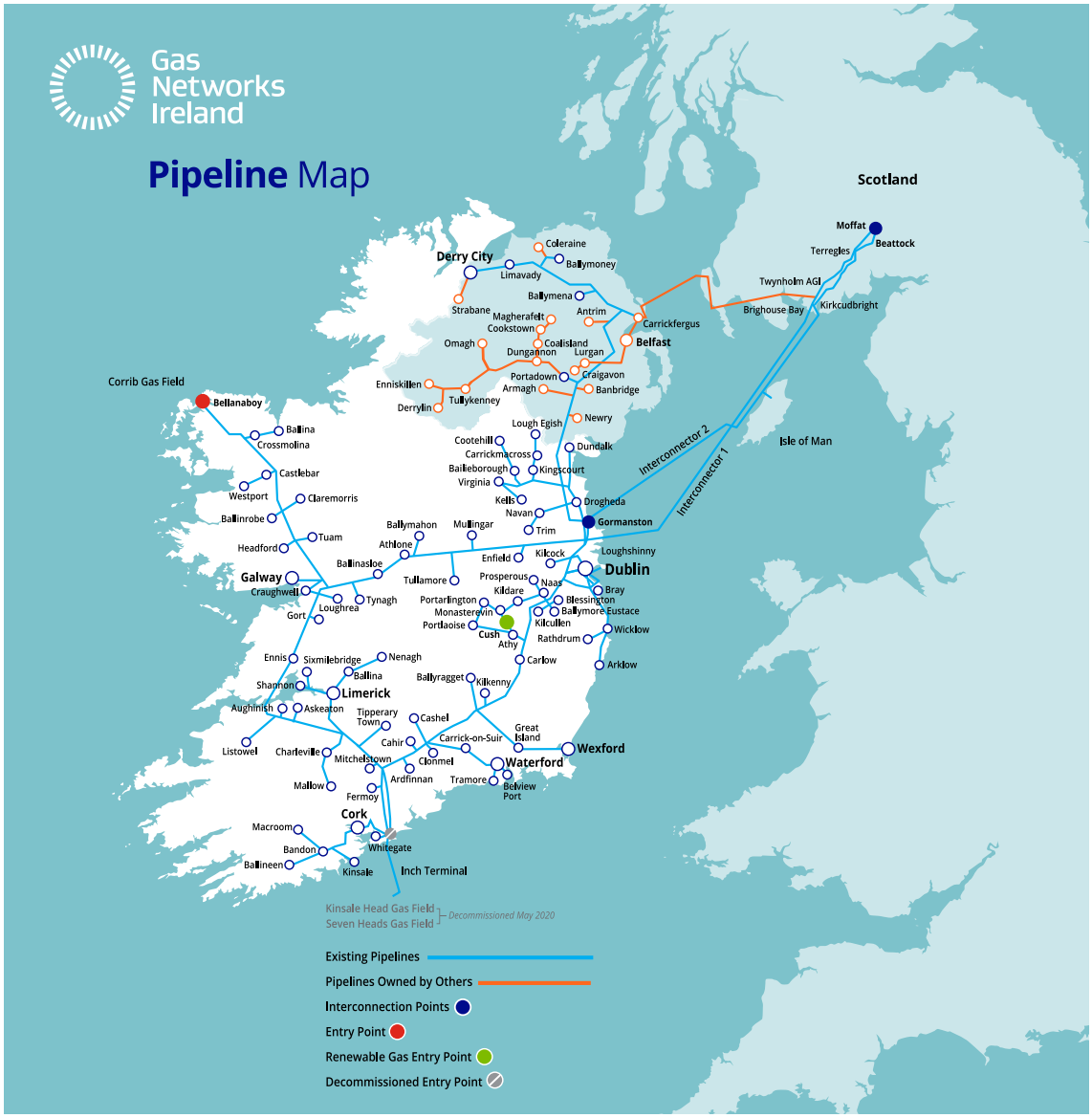
Section 9 refers to key steps required to enable the implementation of a Strategic Gas Emergency Reserve.

2. Ireland's Gas System Today

Ireland's Gas Network

2.1 Ireland's gas transmission network includes the onshore Scottish network, the interconnectors and the onshore national network. The interconnector sub-system is comprised of two subsea interconnectors between Ireland and Scotland; and two compressor stations in Scotland at Beattock and Brighouse Bay. Gas arrives into Ireland at Loughshinny, County Dublin and Gormanstown, County Meath. The interconnector system connects to Great Britain's National Transmission System (NTS) at Moffat in Scotland. Gas is supplied to the Northern Ireland market from Moffat via the Scotland Northern Ireland Pipeline (SNIP) which joins IC1 at Twynholm in Scotland and the Isle of Man (IOM) market via a spur from the second subsea interconnector (IC2). The South-North pipeline connects the gas networks of Ireland and Northern Ireland. The onshore part of Ireland's gas system consists primarily of a ring-main system with spur lines serving various network configurations.

Figure 2.1: Overview of the Gas Network Ireland Transmission System



2.2 In 2022, 26% of Ireland's gas demand was supplied from indigenous sources, the Corrib gas field and small volumes of biomethane. The balance of supply, 74%, was met from the UK via Moffat in Scotland.

2.3 Ireland does not have any gas storage or LNG facilities.

2.4 GNI are carrying out enhancements to the UK facilities to increase the system's ability to meet peak day demand. The pipeline systems in the UK will be able to be operated independently of each other from 2024/25, although it will remain that there are points where they are physically adjacent to each other. The pipelines themselves are entirely separate, but an existing constraint relates to a common pipeline header in the Brighouse Bay compressor station, which will be separated.

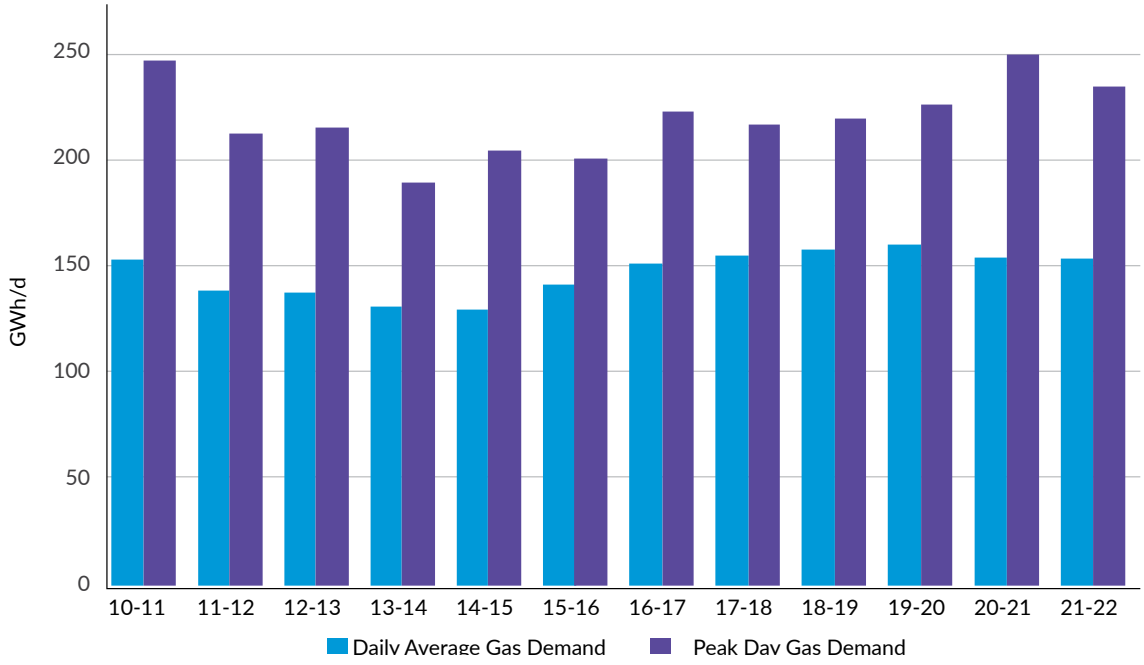
Historic Gas Demand

2.5 Natural gas has a key role in Ireland's energy system. Currently, approximately 30% of Ireland's primary energy needs are met by natural gas, of which 40% is used for heating and almost 50% for electricity generation.

2.6 Ireland's consumption of natural gas has increased over the last decade, largely driven by the increased demand for electricity and some increases in industrial load. Despite growth in wind capacity, power generation sector gas demand has increased by 34% when compared to 2014/15. The increase in power sector gas can be attributed to increasing electricity demand, the closure of peat-fired generators, sustained outages at some other thermal plants (i.e., coal and oil) and the flexible nature of gas-fired generation.

2.7 Peak day gas demand in Ireland typically occurs in winter, when high levels of domestic heating and industrial production coincide with low winds, resulting in high levels of gas-fired power generation. Looking at trends over a longer period, we can see that peak day gas demand has increased in the last 10 years. For 2021/22, peak day gas demand was 233.5GWh/d, while a slight decrease on the previous year, this can be attributed to a very mild winter.

Figure 2.2: Peak Day Gas Demand and Daily Average Gas Demand 2010-2022[1]



[1] Gas Networks Ireland, Gas Forecast Statement 2022

3. Ireland's Gas System in the Future

Context – Climate Action and Low Carbon Development Act 2015-2021

3.1 The Climate Action and Low Carbon Development Act 2015-2021 (hereafter referred to as the Climate Act) commits Ireland to a legally binding target of a climate neutral economy no later than 2050, and to a reduction in emissions of 51% by 2030 (compared to 2018 levels). Through provisions in the Act, a 15-year carbon budget programme with sectoral emission ceilings for each relevant sector were put in place in 2022, to achieve 51% reduction in emissions by 2030 (on a 2018 baseline).

3.2. There are a range of policies now in place which will change the future gas system in Ireland as we transition to a climate neutral economy. These are set out below in respect of demand, supply and infrastructure.

Demand

3.3 There are a number of active policy and operational decisions that will impact average gas demand:

(i) Phase out and end the use of coal and peat in electricity generation; these measures will mean that gas will continue to have a significant role in power generation in this decade.

(ii) Climate Action Plan commitment to deliver in the order of 2 GW of new flexible gas-fired power generation, which will use gas at times of low renewable production.

(iii) Accelerate the delivery of onshore wind, offshore wind, and solar through a competitive framework to reach 80% of electricity demand from renewable energy by 2030; the addition of further renewables will place downward pressure on net demand for gas, particularly as large volumes of offshore wind connects at the end of this decade.

(iv) Deliver an expansive retrofit programme with target of retrofitting 500,000 homes by 2030, the installation of 400,000 renewable energy heat pumps in existing premises by 2030, in addition to only renewable energy heating systems in new dwellings from 2023. The retrofitting programme has already delivered a reduction in residential gas connections and these measures will continue to increase the energy efficiency of our housing stock, deliver the commitment to phase out gas boilers and thereby contribute to putting downward pressure on overall gas demand overtime as well as peak day gas demand.

(v) Establish large scale district heating, with up to up to 0.8TWh by 2025 and 2.7TWh provided by 2030, across residential, commercial and public sector using waste heat or renewable energy sources. This will have a positive impact on the efficiency of natural gas used and put downward pressure on net gas demand by providing alternative energy sources.

(vi) Industry will see a ramp-up of zero emissions heat and district heating in commercial buildings, accelerating uptake of alternative fuels, blending in zero-emission gas and decreasing embodied carbon in construction materials. The National Heat Policy Statement being developed, as well as the Renewable Heat Obligation to be introduced in 2024, will accelerate transition to renewable heat, incentivising switch for industrial energy demand from gas to renewable electricity. These measures will contribute to limiting upward pressure on gas demand, while work is ongoing to develop further measures to effectively target harder to abate industry sectors.

(vii) New data centre connections are required to have back-up on-site generation (and/or battery storage) that is sufficient to meet their own demand and, to assist in full decarbonisation of the power system. Going forward this generation should also be capable of running on renewably sourced fuels (such as renewable gas or hydrogen) when supplies become more readily available. These measures will moderate any potential impact of growth in gas demand.

3.4 The measures above when combined are expected to reduce overall gas demand. They should also have a consequent impact on peak demand. In addition, there are measures which will impact peak day gas demand directly:

(i) Deliver at least three new transmission grid connections or interconnectors more than tripling capacity, with further interconnection capacity anticipated through the Electricity Interconnection Policy published in July. Increased interconnection will allow peak energy demand to be met by other means if required.

(ii) Ensure that 15-20% of electricity system demand is flexible by 2025, increasing to 20-30% by 2030, to reduce peak demand and move demand to times of high renewable output. The provision of batteries and long-term storage of renewable power will support achieving these targets, increase demand flexibility and help to offset overall gas demand

Supply

Indigenous Natural Gas Supply

3.5 Output from the Corrib gas field, Ireland's remaining indigenous natural gas supply, is projected to decline over the course of this decade. The Policy Statement on Petroleum Exploration and Production in Ireland, published on 12th August 2022, reflects the policy and legislative position of the Government on petroleum exploration and production. The policy states that whilst no new authorisations for new exploration will be granted, holders of existing authorisations can continue to apply to progress through the standard licensing lifecycle stages towards a natural conclusion, which may include expiry, relinquishment, or production. The specific legislative provisions related to this are set out in Section 21 of the Climate Act[2].

Indigenous Renewable Gas Supply

3.6 Indigenous renewable gases such as biomethane and green hydrogen will play a larger role and a critical component in Ireland's future decarbonised energy system. The National Biomethane Strategy due for publication later this year, will identify all necessary actions to deliver the national target of up to 5.7TWh by 2030.

3.7 The National Hydrogen Strategy, published in July 2023, will support delivering the full potential of this resource in Ireland. With an existing target of an additional 2GW of offshore wind power for green hydrogen production to be in development by 2030, the Strategy commits to develop long-term and seasonal hydrogen storage to support the power sector in addition to supporting hard to decarbonise sectors such as industrial heating, aviation and shipping. As a result, natural gas use in the industrial sector is expected to reduce.

[2] Climate Action and Low Carbon Development (Amendment) Act 2021, Section 21 (irishstatutebook.ie)

Infrastructure

3.8 Hydrogen infrastructure is expected to roll out initially across several regional clusters where production, high priority demand and large-scale storage are co-located. The expansion and linking of these clusters into a national hydrogen network will be key to creating a liquid mature hydrogen market. Where feasible, repurposing existing natural gas pipeline infrastructure to hydrogen is favourable. Work to date has shown promising results in terms of the technical capability of the gas network to transport hydrogen blends up to 100%, and a policy plan to transition the gas network to hydrogen will be developed.

Implications

Demand

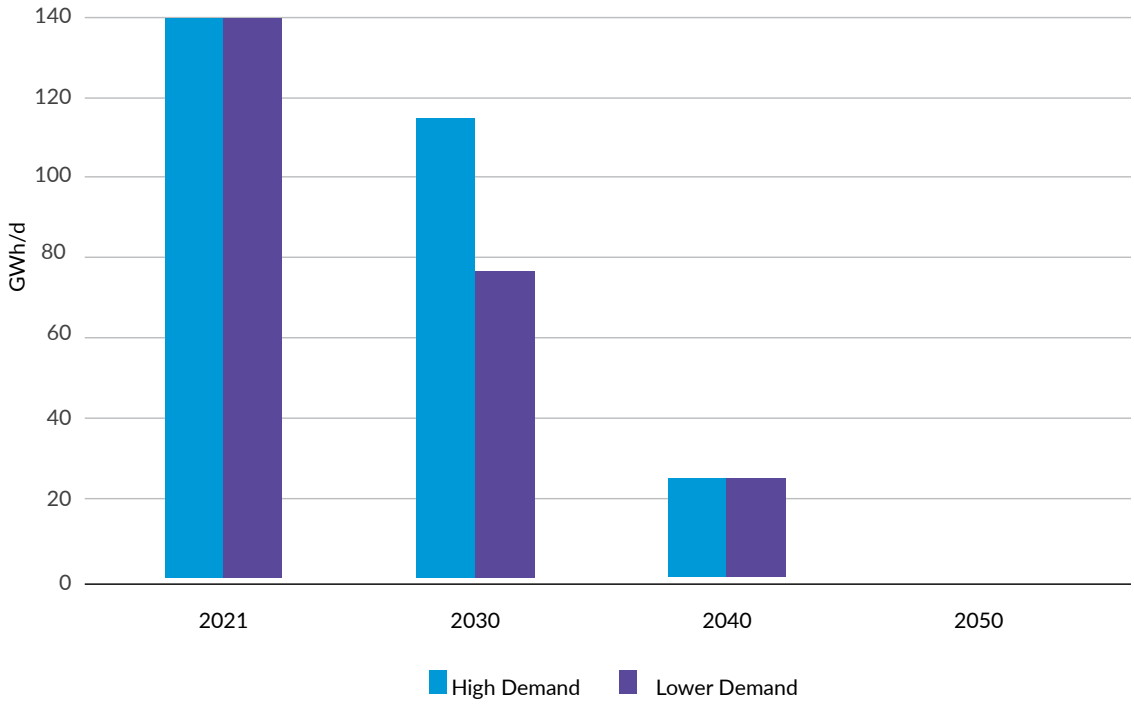
3.9 As a result of the core policies referred to above, particularly as renewable generation continues to increase throughout this decade, annual gas demand is forecast to fall between 2021/22 and 2030/31. However, the "1-in-50 peak day demand"[3] is predicted to grow for "average year peak day"[4] in the same period, as natural gas will play a greater role in meeting increased electricity demand on days of low renewable penetration during this period.

3.10 Looking beyond 2030, MaREI Centre of University College Cork (UCC) have examined the role of natural gas in the energy transition consistent with Ireland's carbon budgets up to the period to 2050 across a number of scenarios. While uncertainties remain when forecasting trends, particularly beyond 2030 given the many variables that exist. Figure 3.1 below presents data for two scenarios from this study. The first scenario 'High demand' refers to strong growth in electricity demand and second scenario 'Lower demand', refers to high renewable electricity capacity and lower electricity demand growth. While it illustrates there may be varying level of natural gas demand in the early 2030s, a similar pattern is observed in terms of level of gas demand consumed in 2040 and 2050 period. Natural gas demand sees a significant reduction of between 68-78% from 2030 to 2040, depending on the scenario considered. This demonstrates the significant reduction of natural gas use anticipated, reducing the reliance on imports during this period and its limited role in our energy system as we reach 2040.

[3] "1-in-50 peak day" demand refers to a day of exceptionally high gas demand occuring with a statistical probability of once in 50 years.

[4] "Average year peak day" refers to maximum daily gas demand under 'average year' weather conditions, i.e., the highest level of gas demand during the weather conditions that typically occur each year.

Figure 3.1: UCC Future of Natural Gas in Ireland's Energy Transition consistent with Carbon Budget[5]



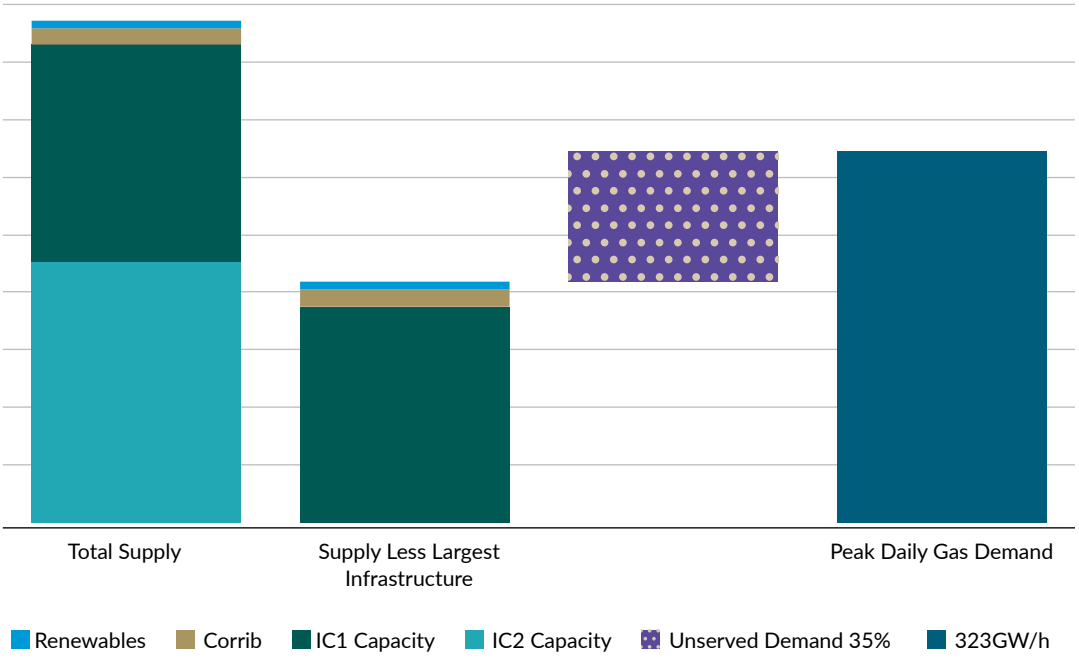
Supply

3.11 As a consequence of the Corrib gas field declining in the medium term, and in the absence of any new find of natural gas, Ireland's natural gas supplies are expected to be almost entirely supplied by UK imports by 2030. While, by the mid-2030s natural gas supply will be increasingly replaced with renewable gases further reducing overall natural gas demand levels, there is a period as part of this transition where Ireland is largely reliant on UK gas imports.

3.12 Should there be an interruption to UK gas supply on a day of peak gas demand due to low availability of renewable sources, there is potential for up to 35% of demand being unmet as illustrated in Figure 3.2 below. The potential unserved demand is calculated using the EU infrastructure standard N-1 formula.

[5] UCC MaREI

Figure 3.2: Graphical Representation of Potential Unserved Demand in 2030 from Disruption to Single Largest Infrastructure



3.13 Ireland has legal requirements under gas Regulation (EU) 2017/1938 in respect of meeting a prescribed infrastructure standard. It requires that EU Member States are capable of meeting exceptionally high gas demand in the event of a loss of its largest single piece of gas infrastructure. For Ireland, this would be a disruption of supply from IC2 interconnector with the UK. In a 2030 scenario, supply from other available sources would be via IC1 interconnector, renewable gases and the Corrib gas field. Further detail on the N-1 infrastructure standard is set out in Section 6 of this report.

3.14 Figure 3.2 was developed using the following assumptions:
Peak daily gas demand in 2030 was taken from GNI Gas Forecast Statement 2022[6] which is calculated as 323GW/h (ROI and IOM together) for 2029/30, which reflects an increase on current peak demand levels as referred to in Section 3.9. Daily send out capacity volumes of the interconnectors, 'IC Capacity', is calculated taking account of ongoing and approved future upgrades to the system entry capacity, with data provided by GNI. The forecasted supply from Corrib gas field and renewable gases on the system is based on the GNI Gas Forecast Statement 2022.

New Policy Measures

3.15 Future changes to Ireland's natural gas demand, supply and infrastructure suggest a two-part approach with 'permanent' and 'transitional' measures required to address risks to unmet demand should a disruption to supplies occur. 'Permanent' measures, consistent with transitioning our energy system in line with statutory carbon budgets will take longer to develop and implement to full effect, however, will ultimately ensure the long-term security of Ireland's energy system and needs. All policy measures will be implemented concurrently to support Ireland's immediate and future energy security requirements, effectively closing any gap in risks to unmet demand.

[6] Gas Networks Ireland, Gas Forecast Statement 2022

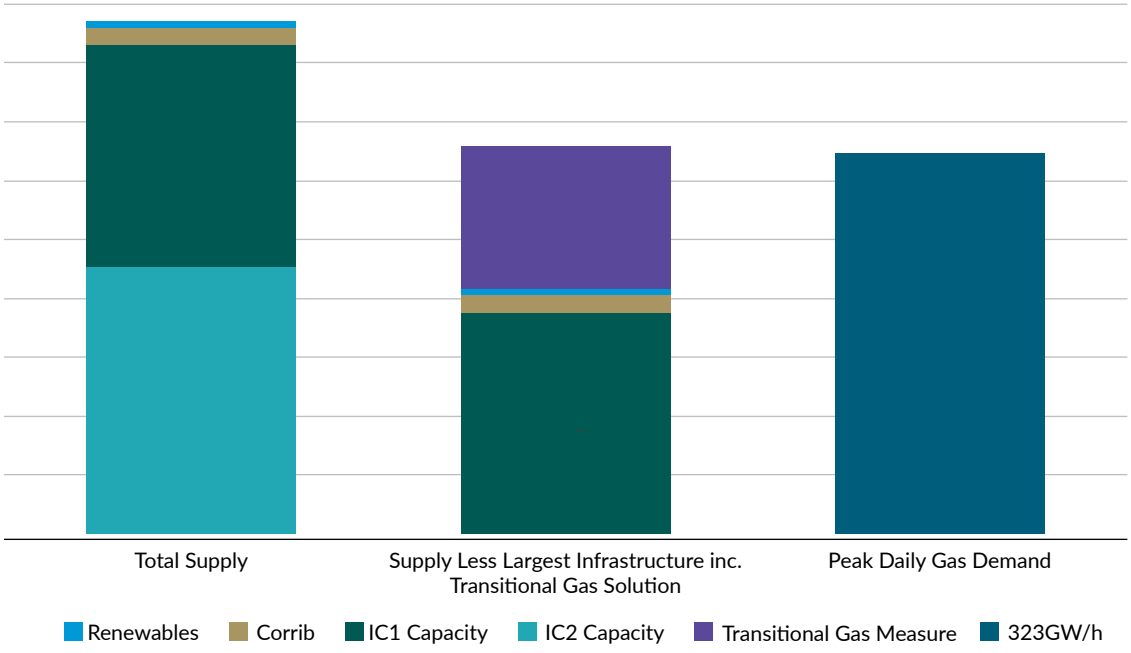
Permanent Measure

3.16 It is proposed to introduce further measures that will provide an enduring solution based on Ireland's long-term future requirements. When developed at scale, such measures will sufficiently deliver security and resilience replacing the need for transitional measures. This is set out in Part B of this report.

Transitional Measure

3.17 As illustrated in Figure 3.3, it is proposed to introduce a transitional measure to address any unmet demand should a significant disruption occur to Ireland's largest gas infrastructure in the medium-term. This is set out in Part C of this report.

Figure 3.3: Graphical Representation of Transitional Measure Closing Gap of Risk in Unmet Demand if Disruption to Single Largest Infrastructure



3.18 An assessment of the risks and options for transitional mitigation measure will be presented and discussed in Part C of this report.

Part B: Long-Term Plan

4. Long-term Plan

Enduring Large Scale Renewable Gas Compatible Storage Solution

4.1 There is presently no gas storage solution available which is of a scale capable of meeting Ireland's gas demand during a peak period, in the event that the largest interconnector (IC2) was to fail. Further, it is not prudent for Ireland to develop a permanent storage solution that is not compatible with the development of renewable hydrogen and inconsistent with our objective to decarbonise our economy to be climate neutral no later than 2050.

4.2 Part C of this report sets out the proposed measures to address our gas security of supply risks while an enduring solution is put in place. The long-term approach to securing our gas supplies will require a parallel approach to be adopted in order to develop a net-zero compatible solution and replace the transitional measure envisaged:

- **Close the gap:** this means decreasing the demand for natural gas, both average and peak and increasing the production of renewable gas.
- **Develop long-term gas storage solutions** which can store renewable gas, in particular hydrogen.
- Ensure a **fit-for-purpose gas grid**, that supports Ireland's energy and climate ambition.

Close the Gap

4.3 Policies are in place across a number of areas to reduce gas demand; this includes but is not limited to our retrofitting programme, increasing renewables and large-scale district heating as outlined in Section 3.3.

4.4 Policies are also in place and being developed to deliver significant increases in renewable gas. Renewable gases such as biomethane and hydrogen will gradually replace natural gas and will increasingly represent greater shares of our energy mix, particularly from 2030 onwards. These will be domestically produced, reducing reliance on imports further strengthening our energy autonomy.

Renewable Compatible Gas Storage

4.5 Establishing large scale renewable gas compatible storage offers permanent and sustainable security of supply to Ireland's energy system. Recognising the transitional role of natural gas as part of moving to an integrated net zero energy economy, permanent gas storage solutions compatible with renewable gases will be developed.

4.6 The National Hydrogen Strategy proposes a range of measures supportive of this approach including:

- Undertake further work to determine the quantities and profile of zero carbon long duration energy storage needed out to 2050 and develop a roadmap as to how it can be delivered.
- Undertake a review of the existing licencing and regulatory regimes relevant to the geological storage of hydrogen and progress the necessary legislative changes and development of regulatory regimes to facilitate future prospecting and development of underground hydrogen storage solutions.

4.7 Other emerging geological storage solutions also offer potential as large energy storage mechanisms. These include salt caverns, lined rock formations or in the form of hydrogen derivatives. Work is also underway on assessing the hydrogen storage potential within man-made salt caverns off the coast of Ireland. The hydrogen salt storage assessment project is a research project, funded by SEAI with the Geological Survey Ireland, being delivered by SLR Consulting Ltd in partnership with Illmatic Energy.

4.8 The South-West Kinsale reservoir, a satellite of the Kinsale gas field, has previously been used for seasonal storage and could potentially offer a solution for offshore gas storage. As assessed in more detail in Section 7, the South-West Kinsale gas reservoir is not adequate to secure our current levels of gas supplies, however when gas demand has dropped and significantly greater levels of renewable gas are available, it can play a role in securing our gas supplies. First, it is important to know if the reservoir can store hydrogen and natural gas (including biomethane), so an investment is not made in permanent infrastructure, which is not future-proofed.

4.9 Therefore, the following additional measure is now proposed as part of this review:

"That research is carried out, led by Geological Survey of Ireland, and involving engagement with industry and interested parties on potential sites for hydrogen storage, including consideration of the Kinsale gas fields future capacity."

Fit-for-purpose Gas Grid

4.10 As Ireland reduces its gas demand and increases renewable gas production the role that the existing natural gas grid plays will need to evolve. This is recognised in the National Hydrogen Strategy, which includes a number of measures to ensure the grid is fit for purpose for Ireland's future hydrogen needs:

- Continue work to prove the technical capabilities of the gas network to transport hydrogen through the network and closely work with the network operators in neighbouring jurisdictions in respect of interoperability between the networks.
- Develop a plan for transitioning the gas network to hydrogen overtime. The plan should look to identify where the network can be repurposed, or where new pipelines may be required and provide detailed costings and a programme of works.

4.11 As a further measure to support Ireland's objective towards a net zero energy system, it is proposed to undertake a **Network Transition Plan of Ireland's natural gas** network to determine and support its long-term planning and usage. It will consider how such infrastructure may transition to zero carbon energy transport in the future and determine long-term infrastructure investments. In contrast to electricity, the role of natural gas will decrease so the review will look to identify where the gas network can be repurposed, or decommissioned, promoting cost effective energy system integration where possible in achieving our decarbonisation and security objectives.

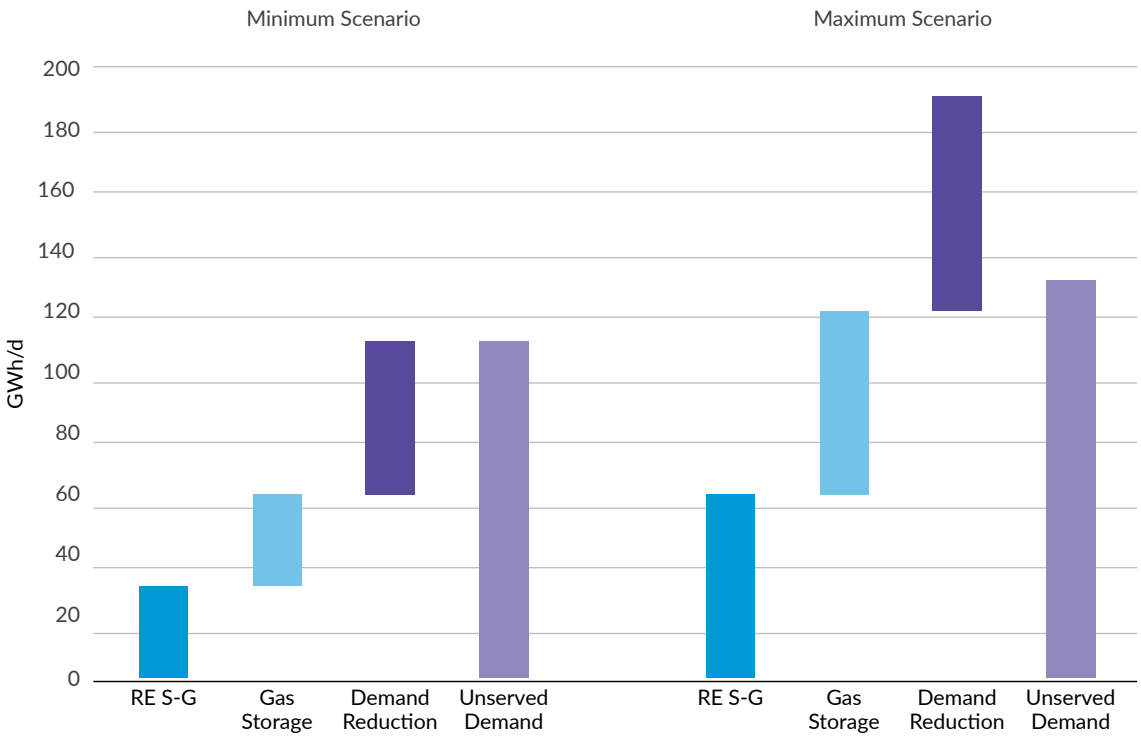
Long-term Policy Solutions for Security of Ireland's Energy System

4.12 The table below provides a summary of the key policies that will provide long-term security and resilience to Ireland's energy system. When delivered to sufficient scale, it will remove the requirement for transitional gas security of supply measure. The minimum and maximum range required of these key policies is further illustrated in Figure 4.1 below.

Table 4: Summary of Key initiatives to Replace Transitional Gas Measure

Objective	Key Pathways	Next Steps
Increase Production of Renewable Gas (30-60 GWh/d above 2030 targets)	• Biomethane • Renewable hydrogen	• Production of Biomethane Strategy • Implementation of the National Hydrogen Strategy • Transposition of EU Hydrogen and Decarbonised Gas Market Package
Introduce Renewable Compatible Gas Storage (with 30-60 GWh/d send out)	• Geological Storage • Compressed tankers • Hydrogen derived carrier storage	• Complete Hydrogen Salt Storage Assessment • DECC Assessment of potential sites for hydrogen storage • Network Transition Plan of Ireland's Natural Gas Network
Reduce Peak Day Gas Demand (40-70 GWh/d reduction on 2030)	• Renewable electricity displacing gas demand • Energy Efficiency reducing homes and business demand • Batteries and long-term electricity storage • Renewable Heat • Demand side response • Electricity Interconnection • Gas Connection policy • District Heating	• Continual delivery of renewable electricity (onshore wind, Solar, Offshore wind) • Continual delivery of National Retrofit Programme • Implementation of Energy Efficiency Directive • Production of Electricity Storage Framework • Support active customers through smart metering, smart energy services and tariffs • Renewable Heat Obligation Scheme • Production of Demand Side Strategy • Implementation of National Policy Statement on Electricity Interconnection • Review of Gas Connection legislation • District Heating Steering Group Report

Figure 4.1: Graphical Representation of Minimum and Maximum Scenarios of Future Renewable Gas (RES-G), Gas Storage and Demand Reduction



Any unmet demand of 110 GWh/d met by minimum range levels of renewable gas, storage and demand reduction.

A higher unmet demand level of 130 GWh/d can be met and exceeded with full higher range of renewable gas, storage and demand reduction.

Part C: Transitional Measure

5. CEPA Technical Analysis

5.1 The Department commissioned CEPA to undertake a technical analysis of the security of supply of our gas and electricity systems, which accompanies the published consultation document (**Annex 4**).

5.2 CEPA modelled five different shocks to the electricity and gas system in the years 2025 and 2030.

- **Shock 1:** A two-week cold spell, based on 1-in-20 temperature conditions, coupled with a period of low wind and low solar generation. It is assumed that these weather conditions affect the whole island of Ireland, as well as the interconnected markets.
- **Shock 2:** The same 1-in-20 weather event as in Shock 1 plus an outage of the largest electricity interconnector (assumed to be EWIC in 2025 and Celtic in 2030). The interconnector outage is assumed to last for 30 days.
- **Shock 3:** The same 1-in-20 weather event as in Shock 1 plus loss of gas Interconnector 2. The interconnector outage is assumed to last for 30 days.
- **Shock 4:** Loss of both gas interconnectors for seven days, normal winter conditions.
- **Shock 5:** Loss of both gas interconnectors for 30 days, normal winter conditions.

5.3 For Shock 1 and 2, the results showed that sufficient levels of gas were available to meet demand. For Shock 3 the system is very close to not meeting demand, but demand is met through a combination of utilising Interconnector 1 fully, switching to secondary fuel-use in power generation and the use of gas linepack[7] in the network. CEPA also assume a high level of delivery of Ireland's climate measures (CAP 2019 and CAP 2021 plan full delivery) which reduces demand and increases delivery of renewables, interconnection, etc. If this linepack was not available in practice, there would be some gas demand not met.

In their consultation response GNI highlighted that '*Linepack is not permitted to be modelled as a mitigation measure in the N-1 calculation methodology and in any case would only be a limited temporary solution. Furthermore, it is optimistic to presume that in the case of a disruption which removes key components of gas infrastructure from operation, that the gas within that same infrastructure remains available for use.*'

For Shock 4 there is severe disruption to gas demand, with 62% of all non-power sector gas demand unserved. Electricity demand can be met if there is variable renewable generation available and through the use of secondary fuel-use in power generation.

For Shock 5 there is again severe disruption to gas demand and periods of unserved electricity demand also.

5.4 CEPA then assessed Shock 4 and 5 again, but this time utilising a list of mitigation options. The mitigations chosen were shortlisted from a long list based on three criteria: potential for alleviation of identified shocks, feasibility and consistency with Climate Action Plan and other climate objectives.

5.5 The outcome of the analysis showed the following results for the shortlisted mitigations in the gas sector:

[7] Linepack describes the total volume of gas contained within the gas network.

Table 5.1: (Mitigation Option Shock 4 & 5 Unserved Demand)[8]

Mitigation Option	Shock 4 Unserved Demand	Shock 5 Unserved Demand
Strategic Floating LNG (FSRU)	0	0
Strategic Gas Storage	108 GWh	714 GWh
Gas Mitigation Package (a combination of strategic gas storage, biomethane, demand side response, hydrogen)	54 GWh	792 GWh

5.6 This analysis indicates a strategic FSRU as the only short-listed option that can fully mitigate unserved demand in Shock Scenario 4 and 5 which involves disruption of seven or 30 days of both gas interconnectors.

5.7 Although commercial LNG was considered as part of the long list of mitigation options, CEPA did not short-list commercial floating or fixed LNG for the following reasons:

a) They would likely result in the importation of fracked gas.

b) The embedded emissions of LNG can exceed pipeline gas.

c) There would be no guarantee of gas in store, although this could be partially mitigated through a requirement on operators to hold a minimum level of stocks.

5.8 CEPA carried out an additional analysis for the Department to assess the impacts of a full supply disruption of Russian gas deliveries. They found a limited impact on Irish gas supplies given the UK diverse gas supplies provide a degree of protection to Ireland.

[8] Cambridge Economic Policy Associates, Technical Analysis of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems, September 2022

6. Risk Assessment

6.1 In the consultation on this review process, the accompanying analysis set out a number of shocks that could threaten security of gas supplies, for both demand side and supply side shocks. As detailed in Section 5.2, demand side shocks related to unexpectedly low wind and temperatures and a combination of both. The supply side shocks focussed on a technical failure to the physical infrastructure from the UK and geopolitical disruption. Additional analysis demonstrated that Ireland's exposure to a full cessation of Russian gas would likely lead to some reduced supplies but to a lesser extent than many other European countries who are historically more heavily dependent on Russian gas.

6.2 The Government's 'National Risk Assessment - Overview of Strategic Risks 2023'[9] states that *"The lack of diversity of supply sources and storage is a risk for security of supply. Risks in relation to secure and sustainable energy supplies have been heightened and intensified by the war in Ukraine and sanctions on Russian supply resulting in a considerable price shock to global energy markets."*

6.3 The IEA completed an in-depth review of Ireland's energy policies earlier this year. While the IEA are finalising their findings and report, their preliminary draft recommendations, in respect of energy security state:

"Ireland should:

a) *continue to perform rigorous emergency exercises about gas disruption scenarios with all relevant stakeholders. Analyse worst case scenarios and viability of transporting secondary fuels to power generating plants in case of a prolonged disruption.*

b) *assess the result of the gas consumption reduction measures carried out in the winter of 2022/23 to inform future planning of natural gas demand reduction measures.*

c) *consider the option of a FSRU as a strategic gas storage asset in an emergency.*

d) *swiftly conclude the MoU with the UK on security of gas supply.*

e) *consider the impact of a prolonged gas supply disruption on all sectors of the economy with the aim of establishing criteria to define those gas users that would be subject to government-mandated non-market measures for demand reduction, and involve all the stakeholders in an information campaign to gain community understanding."*

6.4 The CRU '2022 National Risk Assessment: Gas'[10] highlights that Ireland is not fully compliant with the EU Infrastructure standard. Ireland's N-1 has decreased from 85% in 2018 to 65% in 2022 and remains unable to meet the Infrastructure Standard (N-1) in the event of failure of its largest piece of gas infrastructure i.e., if the supply of gas via Moffat is partially disrupted Ireland will be unable to deliver sufficient gas from other entry points to meet total demand on a 1 in 20 year peak-day.

6.5 If Ireland is not able to meet its gas demand it could have very significant impacts on the country, depending on the timing and duration of any disruption to supplies, according to an ESRI working paper 'The Cost of Natural Gas Shortages in Ireland'[11] that was published in 2010. The Economic and Social Research Institute (ESRI) paper estimated the cost of disruptions in the supply of natural gas and found that (i) the cost of losing one day of gas-fired electricity amounts to 0.1-1.0 billion euro, depending on the time of week, the time of year, and the rationing scheme used, (ii) the cost of losing three months of gas-fired power could be as high as 80 billion euro or 50% of GDP and (iii) losing gas for heating for three months would add another 8 billion euro on average. In this paper, ESRI also discuss some options to increase Ireland's security of supply and find that the cost is a small fraction of the avoided maximum damage. It is noted that this assessment does not cover the social impact of a gas supply disruption. The Department has requested ESRI to prepare an update to this analysis.

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9 National Risk Assessment 2023 – Overview of Strategic Risks

10 The Commission for Regulation of Utilities Annual Report on Gas Security of Supply 2022

11 The Economic and Social Research Institute, The Cost of Natural Gas Shortages in Ireland

6.6 The Department received significant feedback through the consultation process on the risks to Ireland's gas security of supply. It also asked CEPA to report separately on the risks to gas imports from the UK. The Department has identified five key risks to the security of our gas supplies.

Risk 1: Technical Disruption

6.7 The gas import infrastructure for importing gas from Great Britain to Ireland has been extremely reliable since its introduction 30 years ago. However, a technical failure on the interconnectors from Scotland could result in a total suspension of import availability from the GB system.

6.8 CEPA prepared an assessment of the infrastructure failure risk based on pipeline failure rates.

Table 6.1: CEPA assessment of infrastructure failure risk[12]

Interconnector	Length (km)	UK pipeline failure rates per 1000km / year (2014-2018)	Rate of failure based on UK industry rates	EU pipeline failure rates per 1000km / year (2015-2019)	Rate of failure based on European industry rates
IC1	204	0.100	1 in 49 years	0.126	1 in 39 years
IC2	192	0.100	1 in 52 years	0.126	1 in 41 years

Source: CEPA analysis of UKOPA and EGIG data

Based on the failure rates shown above, the chance of concurrent failure in both in the IC1 and IC 2 pipeline over the same year is negligible, greater than 1 in 1,600 years.

GNI has noted to the Department that they do not consider these estimates to be representative of the interconnector pipelines, noting their modern construction techniques, along with the maintenance regime employed. GNI further noted that traditionally, third party damage (TPD) would be considered the primary risk to the continued safe operation of the pipelines. TPD occurs when any party excavating in the vicinity of pipeline impacts the structural integrity of the pipeline.

6.9 A technical disruption of gas can also occur due to an infrastructure failure of associated equipment other than a pipeline failure, such as valves or compressors. The importation of gas into Ireland requires the compression of gas via 10 compressors in Scotland, four compressors are located at Beattock and six installed at Brighouse Bay, for gas delivery across the Irish Sea. A failure of several of these compressors at one time would put security of supply at risk. This scenario could arise as a result of scheduled maintenance outages coupled with forced unplanned outages. This situation has occurred previously to a level that has left little redundancy in the system.

6.10 Ireland has legal requirements under gas Regulation (EU) 2017/1938, in respect of meeting a prescribed infrastructure standard. Article 5(1) states that:

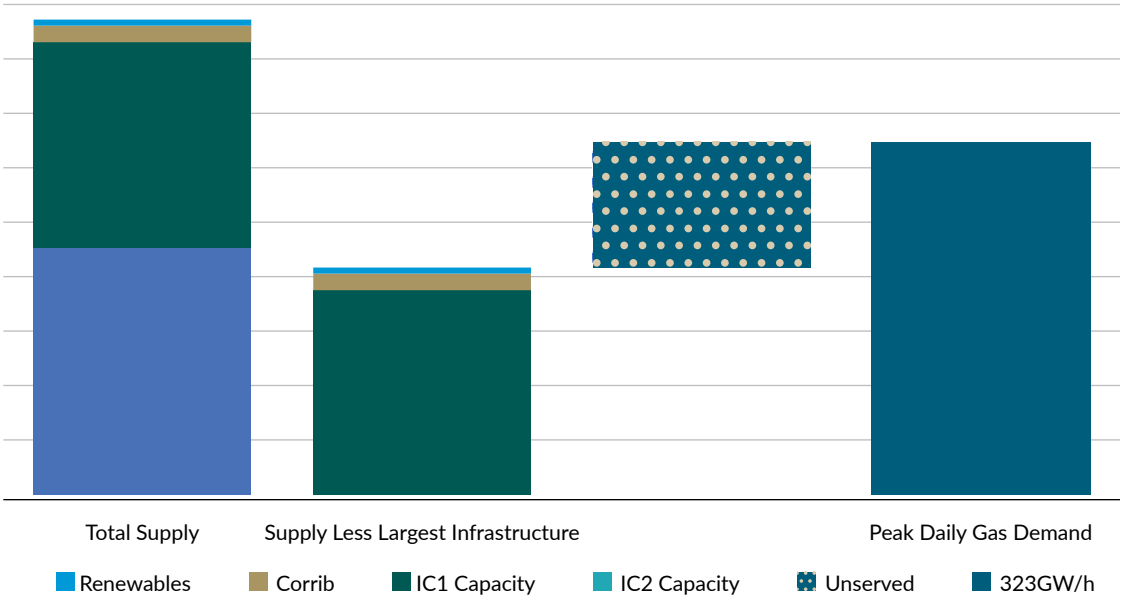
"Each Member State or, where a Member State so provides, its competent authority shall ensure that the necessary measures are taken so that in the event of a disruption of the single largest gas infrastructure, the technical capacity of the remaining infrastructure, determined in accordance with the N – 1 formula as set out in point 2 of Annex II, is able, without prejudice to paragraph 2 of this Article, to satisfy total gas demand of the calculated area during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years. This shall be done taking into account gas consumption trends, the long-term impact of energy efficiency measures and the utilisation rates of existing infrastructure."

[12] Cambridge Economic Policy Associates, Technical Analysis of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems,

6.11 In its Annual Report on Gas Security of Supply published on the 6th of December 2022[13] (ref. CRU2022975), the CRU highlighted that upon its request, and on the basis of its obligations pursuant to Regulation (EU) 2017/1938, "Gas Networks Ireland carried out analysis that determined that on its own, Ireland could cover 65% of peak-day demand in the event of a disruption to its largest infrastructure. Article 5(3) allows for this obligation to be jointly fulfilled with neighbouring Member States. However, following the UK's exit from the EU in 2021, Ireland is no longer directly connected to any Member State and therefore has no immediate mechanism to meet the Infrastructure Standard." It is noted that there is no derogation on this standard under EU law nor provision to make arrangements with a third country outside the EU, i.e. the UK.

6.12 The EU Regulation allows for the infrastructure standard (N-1) to be met by Member States on a national or regional basis[14]. Ireland no longer meets the infrastructure standard and analysis determines that Ireland can cover 65% of peak-day demand in the event of a disruption to its largest infrastructure which then results in the potential for up to 35% of demand being unmet as illustrated in Figure 6.1 below.

Figure 6.1: Graphical Representation of Potential Unserved Demand in 2030 from Disruption to Single Largest Infrastructure (N-1 infrastructure standard)



6.13 CEPA analysed the impact of a single and combined interconnector failure in their analysis. The loss of one pipeline during a cold period could be mitigated for a period using linepack (gas in the network) in the pipelines and by switching gas-fired power stations to run on distillate (using their limited stocks – five days running for baseload plants). This analysis relies on a number of favourable assumptions including; the availability of linepack, variable renewable generation and that gas-fired generators

[13] The Commission for Regulation of Utilities, Annual Report on Gas Security of Supply 2022

[14] While the UK was still an EU Member State, Ireland complied with this legal obligation on regional basis with the UK. However, since the UK has left the EU, Ireland no longer meets this standard on a regional basis.

switch to distillate successfully. A full disruption to gas imports from GB for a 30-day period resulted in severe disruption to gas consumers in Ireland throughout the shock period with no gas being supplied to the power sector during the disruption and up to 74% of all non-power sector gas demand being unserved during the disruption.

6.14 The Department's view is that the level of risk presented by a technical disruption over the next decade is **unacceptable** at the moment. It further notes that even if a regional approach could be taken to the N-1 infrastructure test as previously was the case, the Department does not consider this acceptable in addressing the risk.

Risk 2: Sabotage/Attack

6.15 Attacks on the Nordstream interconnectors have highlighted the risks to critical energy infrastructure from physical attacks by malicious actors. The Department has consulted with the Department of Defence, Department of Foreign Affairs and the Department of Justice. They have advised that the risk of attack is considered heightened while noting there is no specific threat to Ireland. A further update in Autumn 2023 has advised the risk of attack as an unlikely but high impact event.

6.16 The National Cyber Risk Assessment performed by the National Cyber Security Centre (NCSC) in 2022 found that the increasing 'attack surface' of the systems used to control and monitor energy systems such as those used in gas pipelines are presenting more opportunities for cyber-attacks. Malicious interference of these systems, for example by cyber criminals motivated by financial gain or State sponsored threat actors motivated by ideology or using cyber operations in support of kinetic actions, can lead to disruption of energy supply.

6.17 The NCSC assess that the threat to energy infrastructure from cyber criminals, in particular ransomware groups, is high. In May 2021, the Colonial gas pipeline suffered a ransomware attack against its IT systems which had a knock-on effect on its operations causing severe disruption to gas supplies on the eastern seaboard of the United States.

6.18 The NCSC assess that the threat of targeted destructive attacks against energy infrastructure is low. However, Ukraine and neighbouring countries are continuing to experience large numbers of cyber-attacks against their critical infrastructure, and there is a risk of secondary spill over effects impacting operators who do not share a border with Ukraine.

6.19 The Department's view is that the consequences of a physical disruption to supply caused by sabotage, attack or accidental damage presents an unacceptable level of risk at the moment.

Risk 3: UK Supply Risk

6.20 Reduced availability of gas from the UK would mean interruption of gas supplies in Ireland. The availability of gas supplies to Moffat can be vulnerable to shocks that occur to global demand and supply. For example, the UK is already a net-import-dependent country and negative shocks to global supply or positive shocks to global demand may have a knock-on impact on the availability of gas to Ireland through Moffat.

6.21 Although the UK imports the majority of its gas, it has a diverse source of gas supplies which helps mitigate this risk. The main risk to their gas supplies is their ability to secure LNG deliveries, which may become harder as other European countries increase their LNG import capacity and if there is increased demand from Asia.

6.22 Concerns have been raised over the course of the last year about the UK reducing

gas deliveries to Ireland in case of an emergency in their jurisdiction. A "pain-sharing" protocol is in place between both system operators and unlike other countries that they are connected to, Ireland's gas demand is added to the UK demand when National Gas Transmission are planning their gas system. This risk is further reduced by the completion of a non-legally binding Memorandum of Understanding between both Governments to solidify these arrangements, which further endorses the principle of "pain-sharing" in the event of a problem with gas supplies.[15]

6.23 It should be noted that gas security of supply is an EU competence, i.e., the EU sets out the legal framework which Member States are required to follow. The EU-UK Trade and Cooperation Agreement, Article 315(7) states that "*The Parties shall develop appropriate frameworks for cooperation with respect to the security of supply of electricity and natural gas*". The Department will input constructively on this framework when the EU and UK commence its progression.

6.24 The UK's most recent Preventative Action Plan for gas was published in July 2023. In assessing longer-term risks and level of security to the UK gas system, the UK Government conclude the gas market is robust against a range of adverse events. They also acknowledge that it cannot rule out the risk of supply shortfalls in extreme circumstances, nor the risk of a significant rise in wholesale gas prices to balance the market during times of system stress. The Plan encompasses measures for Great Britain (GB) and Northern Ireland (NI) but recognises specific initiatives underway between NI and Ireland and confirms UK support for continued development of regional cooperation measures and agreements.

6.25 The impact of the UK's exit from the EU could add a further risk to the availability of gas supplies through Moffat. Under the 'solidarity principle', EU Member States are required to share gas supplies with interconnected Member States in emergency situations to ensure that gas supplies to protected consumers and a level of electricity generation are not disrupted. In a situation where global demand outstrips global supply, the UK is no longer bound by EU rules to provide solidarity in energy emergency situations within Ireland.

6.26 Ireland also has legal requirements under gas Regulation (EU) 2017/1938, in respect of meeting a prescribed gas supply standard. Article 6(1) states that:

"The competent authority shall require the natural gas undertakings that it identifies, to take measures to ensure the gas supply to the protected customers of the Member State in each of the following cases:

a) *extreme temperatures during a seven day peak period occurring with a statistical probability of once in 20 years.*

b) *any period of 30 days of exceptionally high gas demand, occurring with a statistical probability of once in 20 years.*

c) *for a period of 30 days in the case of disruption of the single largest gas infrastructure under average winter conditions."*

6.27 Ireland currently meets this standard for its protected customers who consist of all non-daily metered customers (residential and some small businesses) and priority customers in the daily-metered sector, specifically hospitals and nursing homes including retirement homes, high security prisons, district heating schemes and further categories of essential social services as determined by the CRU from time to time.

[15] Minister Ryan announces new energy cooperation agreements with United Kingdom

6.28 CEPA has advised that *"Based on the review by the UK's Department for Energy Security and Net Zero and the CRU, we consider that the risk of supplies being unavailable through Moffat remains low. We also note a more recent November 2021 study by ENTSOG[16] which found that there would be no curtailment of demand in Ireland under a range of disruption scenarios to major gas infrastructure in the UK and Europe"*.

6.29 The Department's view is that the level of risk presented by a UK supply risk (excluding import infrastructure) over the next decade is low, although this outlook could change depending on a number of variables.

Risk 4: Peak Day Gas Demand

6.30 Inability to meet peak gas demand during a cold spell would mean curtailing gas demand to balance the system. By 2030, 80% of our electricity is expected to be produced from renewables, meaning our overall gas demand is expected to decline. However, the electrification of the heat and transport sector will mean increased peak day electricity demand. During those periods where variable renewable generation is largely not available, gas back-up is expected to be used, particularly when support from batteries and electricity demand side response is exhausted. As Corrib declines, Ireland will rely almost entirely on gas via the interconnectors to satisfy peak day demand.

6.31 GNI are currently reinforcing the infrastructure in Scotland in order to ensure the capability of the existing infrastructure to deal with a maximum peak forecast to occur in the middle of this decade. By 2024/25 the interconnectors will provide 390 GWh/d of capacity for Ireland. This will be enhanced by 2026/27 to provide a peak 428 GWh/d of capacity for Ireland. This is set against a peak day 1/50 demand forecast of 323 GWh/d in 2030 as set out in GNI's 2022 Gas Forecast Statement.

6.32 The Department's view is that the level of risk presented of having adequate import capacity once the planned reinforcements are complete to meet our peak day gas demand, as projected by the TSO, is **acceptable** at the moment based on current forecasts.

6.33 Nevertheless, for this risk the Department recommends that the TSO is tasked with establishing a peak day demand response product to reduce demand during periods of very high demand, which has proved very useful in managing electricity demand.

Risk 5: Climate Action Delivery Risk

6.34 The delivery of Ireland's Climate Action Plan (CAP) targets for renewables, power system flexibility, energy efficiency and the heat sector are central to the mitigation of energy security risks. Renewables reduce geopolitical security risks and reduce the impact of supply shocks in fossil fuels. Nevertheless, there are some geopolitical supply chain risks for renewables components, which the EU Net Zero Industry Act and the Critical Minerals Act are seeking to counteract.

6.35 Achieving the CAP targets will help to deliver capacity in the electricity system as the electrification of heat and transport increases demand. In addition, achieving the CAP targets will help Ireland meet requirements under the EU Energy Efficiency Directive

[16] ENTSOG Union Wide Security of Supply Simulation Report ENTSOG Union-wide SoS simulation report 2021. Ireland is considered as part of the 'North Sea Gas Supply' risk group in four different scenarios as set out below: SCENARIO #7 - Disruption of the largest offshore infrastructure to the UK (Technical disruption of Langeled pipeline), SCENARIO #8 - Disruption of the largest offshore infrastructure to continental EU (EUROPIPE II), SCENARIO #9 - Disruption of the largest onshore infrastructure from Norway (Technical disruption of Emden station) and SCENARIO #13 - Disruption of the largest offshore production infrastructure from the UK (Technical disruption of Forties Pipeline system).

(EED), which puts a limit on final energy use. If the CAP targets are not met it will make adhering to the EED extremely challenging. Ireland has made good progress in certain areas of delivery of CAP targets and less in others. With an ambitious programme of measures in place, under-delivery of these measures is a risk to Ireland's energy security. Accelerated deployment of renewables is a valuable energy security measure as it will support reduced reliance on natural gas imports.

6.36 The Department's view is that the level of risk presented by under delivery of the Climate Action Plan remains in need of continuous oversight. The detailed action management and reporting through the annually updated Climate Action Plan and supporting initiatives such as the Offshore Wind Delivery Taskforce and the (onshore) Accelerating Renewables Taskforce continue to be critical.

Overall Assessment

6.37 Gas will play a key role to support the secure transition to an energy system based on electrification and greatly increased renewables penetration. Reducing gas demand and increasing renewable gas production will reduce the impact of Ireland's risk but the risks themselves will remain for at least a decade. The impact of any significant unplanned reduction in the country's gas supplies would have severe economic and social impacts.

6.38 The Department's overall assessment is that the existing policy on natural gas is not adequate to address the range of risks considered fully and therefore ensure security of our gas supplies in the medium to long-term. While five key risks have been identified and considered in detail, other risks could emerge. Aside from reducing demand and increasing renewable gas, the key tools for gas supply risk management are diversity of supplies and increasing gas storage. These tools, which other Member States have utilised, have secured Europe's gas supplies over the course of the last year in the face of a major disruption to gas supplies from Russia. Ireland's diversity of supply is very limited and it has no gas storage.

6.39 Furthermore, the State is operating outside legal requirements set out in EU legislation.

7. Risk Mitigation Assessment

7.1 The Department has considered the mitigation measures that may be needed to address the risks identified as unacceptable in Section 6 of this report. The Department recommends that the mitigation measures chosen must meet specific objectives in respect of the following:

a) **Energy security:** level of security provided equates to ensuring future energy demand is reliably met and able to rapidly recover from system disruption. As a minimum, the proposal must satisfy Ireland complying with EU N-1 infrastructure standard based on 2030 gas demand projections[17].

b) **Sustainability:** mitigates and avoids potential environmental harm and climate change impacts. As a minimum, intervention must be in line with the requirements of the Climate Act.

c) **Affordability:** impact on energy prices as well as operating costs minimised to ensure access to affordable energy for both domestic and commercial use remains.

7.2 The Department has identified the following options for addressing the security of supply risks:

a) Reopen the Irish offshore for new gas exploration
b) Underground gas storage
c) A third gas interconnector to the United Kingdom
d) A permanent onshore facility (LNG storage tanks and import capabilities)
e) An offshore Gas Emergency Reserve (a floating storage and regasification unit.

7.3 The Department recognises that this list does not fully match the CEPA mitigation options shortlist, that is, Floating LNG (FSRU), Strategic Gas Storage and a Gas Mitigation Package (which included a combination of strategic gas storage, biomethane, demand side response, hydrogen). These options have been considered carefully in preparing this report, but have also been informed by the significant consultation responses and the Department's engagement with a wide range of stakeholders.

7.4 Table 7.1 below gives a high-level indication of the key features of these options:

Table 7.1 Key Features of Selected Options

Option	Storage TWh	Max Daily Send Out GWh/d	Comment
New Gas Discovery	250	104	Based on a discovery equivalent to the Corrib gas field
Underground Gas Storage	2.5 - [5][18]	30-60	Based on South West Kinsale previous storage capability and doubling capacity for higher end of range
Third gas interconnector with the UK	N/A	300	Based on IC2 capacity
Permanent Onshore facility (LNG storage tanks and import capabilities)	2.4	360	Based on inputs from the GNI proposal
Offshore Gas Emergency Reserve (Floating storage and regasification unit)	1.2	80-250	Based on GNI data.

[17] Regulation (EU) 2017/1938 sets out key security of supply standards including N-1 infrastructure standard which requires that EU Member States should be capable of meeting exceptionally high gas demand in the event of a loss of the single largest gas infrastructure. The criteria under the N-1 assessment requires that the technical capacity of the remaining infrastructure must satisfy gas demand during a day of exceptionally high gas demand occurring within a statistical probability of once in 20 years.

[18] Geological Survey Ireland to complete study to assess underground storage potential, overall capacity may increase as a result.

7.5 As Ireland transitions to a climate neutral economy its use of fossil fuels must drop dramatically, and a range of measures are set out in the Climate Action Plan to meet this objective. By 2050 Ireland should have very little demand for fossil fuels. However, this does not mean that Ireland can rely entirely on today's fossil fuel infrastructure to bridge to a net-zero economy by no later than 2050. A number of discrete projects will be required to ensure a smooth transition. It is important that such investments, where possible, avoid leaving stranded assets.

It may be possible that because of further measures carried out to secure the gas system, the obligation for gas generators to have secondary fuel available could be relieved. However, it is not appropriate that such a decision by the Regulator would be made at this juncture. This issue can be reviewed under the next security of supply review, which the Department has set out should occur regularly in the Energy Security Package.

Mitigation A: Reopen the Irish Offshore for New Gas Exploration

7.6 Ireland does not currently allow, under primary legislation, for new exploration licences for either gas or oil to be granted. However, existing licence holders are permitted to continue to progress licences already granted. A significant number of consultation responses supported a change in Government position on this matter to reopen Ireland's offshore for new gas exploration, with a number emphasising that this could be particularly valuable near the Corrib gas field where the infrastructure to land gas already exists.

7.7 The discovery of new indigenous natural gas reserves delivered to Ireland would enhance the security of our gas supplies. However, to issue new licences for exploration beyond existing authorisations would require a change in primary legislation and a reversal of Government policy. It would also require the roll-out of a large programme to encourage investment from oil and gas companies. Noting that many large oil and gas companies left Ireland following the decision to cease offering new licence areas (even though their existing licences were unaffected), investment conditions for petroleum exploration in Ireland are such that they would likely seek a significant level of reassurance on the policy before returning.

Energy Security

7.8 While a substantial find of natural gas would, provided it landed in Ireland, significantly enhance security of supply, Ireland's discovery rate does not compare well with other exploration regions. Even if an existing authorisation or a newly issued licence (if legally possible) led to the discovery of a natural gas field, there is no guarantee that the volume discovered would address Ireland's security of supply concerns. That is, to address a failure of the largest interconnector or allow Ireland to meet at a minimum, the N-1 infrastructure standard.

7.9 The IEA[19] estimate the average lead time from discovery to production to be 16 to 17 years. These lead in times also mean it is difficult to consider this option as an appropriate solution to address medium-term concerns.

Affordability

7.10 The cost of further exploration would, using the current approach to exploration, be at industry's expense and therefore would not result in a cost to gas customers. A find of natural gas (or oil) may provide increased tax returns resulting in positive impact to the Exchequer. However, there is no guarantee of a further discovery. Indirect costs such as damage to the environment due to further exploration activities can also be noted.

[19] International Energy Agency, Global average lead times from discovery to production, 2010-2019

Sustainability

7.11 Responses from the public consultation highlighted that the life-cycle carbon impact of indigenous gas is expected to be less than gas imported from further afield. CEPA's assessment supports this argument, whether by pipeline or liquified natural gas. However, it is not possible to ascertain the volume of gas that would be discovered and estimate its emission impact versus the climate commitments set out in the Climate Act.

7.12 It can also be noted that providing avenues for new fossil fuel production would be inconsistent with the Paris Agreement objectives as the UN Environment 2021 Production Gap Report determines global planned fossil fuel production is already inconsistent with limiting global warming to 1.5 degrees or 2 degrees.

7.13 Furthermore, any discovery is likely to take a significant period of time to bring online and would therefore still be producing gas towards 2050, locking Ireland into a high-gas energy market when it is required to be a net-zero economy. This is inconsistent with the Climate Act objective of achieving a climate neutral economy no later than 2050.

7.14 Having considered these matters, the Department does not recommend changing the current policy position set out in primary legislation on oil and gas exploration.

Mitigation B: Underground Gas Storage

7.15 Storing gas and having it available in case of a supply shortfall is a well-established measure in Europe and globally.

7.16 Ireland has no operating gas storage facilities. The South-West Kinsale reservoir, a satellite of the Kinsale gas field, has previously been used for seasonal storage and is the most likely candidate for offshore gas storage. Its daily delivery rate was relatively low at 29 GWh/day. PSE historically operated the storage at South-West Kinsale with a *working gas: cushion gas* ratio of around 0:2. It is possible that this ratio could be increased, however injected gas above a certain critical volume may risk escape to the main Kinsale Head reservoir. Reservoir and infrastructure modelling work would be required to demonstrate feasibility.

7.17 The neighbouring satellite field named Ballycotton which is larger than the South-West Kinsale reservoir could potentially be also used for storage, although it was only previously used for production. However, the owner previously advised the Department that having studied its potential to operate as a gas storage facility the reservoir was determined to be unsuitable due to observed leakage of gas from it to the Kinsale Head reservoir through the common aquifer.

7.18 The fields would require gas injections (cushion gas) to bring them up to a level of pressure required to store gas. PSE Kinsale states in their consultation response that approximately 1bcm of gas would need to be injected back into the South-West Kinsale reservoir to restore productive capacity.

7.19 The consultation responses have also included reference to other offshore caverns in Ireland's jurisdiction (e.g., Dublin Bay area, which are salt based) as potential candidates for gas storage. However, there is currently little information available on these sites as potential gas storage sites, although research is ongoing into their potential as hydrogen storage sites. The realisation of storage at these sites would be very welcome development from an energy security point of view and would accelerate the phase out of any transitional measure.

7.20 The Kinsale fields have also been identified in some consultation responses as potential enablers for the development of Ireland's hydrogen market.

7.21 The pipelines offshore for the Kinsale gas fields have now been decommissioned which included displacing with seawater, although the onshore pipeline connecting the shore to the gas network has not been decommissioned yet.

7.22 To implement this policy measure, a legal and regulatory framework for gas storage would need to be introduced.

Energy Security

7.23 The storage of gas would enhance Ireland's security of gas supply. The historic storage delivery rate from South-West Kinsale is substantially below present-day gas demand and would need to be at least five times greater than is currently possible. Even with an increased cushion gas /working gas ratio, the gas field could not deliver adequate gas supplies to address the risk of an interconnector failure, meaning it does not satisfy Ireland meeting N-1 infrastructure test. It is noted that the field could not be replenished in case supplies from the UK were not available.

7.24 Deliveries of gas in the Cork area to replace the interconnector capacity would require reinforcement of the gas grid to allow storage gas to reach the network in sufficient quantities to meet daily gas demands.

Affordability

7.25 New investments in natural gas storage are not considered commercially viable at present, and therefore it is expected a significant level of State support would be required to introduce this proposal. While difficult to quantify capital costs, it would include a high cost for cushion gas to restore productive capacity at the outset. This could negatively impact energy prices for the consumer.

7.26 As overall gas demand is anticipated to decrease in the next 10 years, there is a risk of stranded asset for the State, in case the facility was not future-proofed.

Sustainability

7.27 Gas storage would have little direct climate impact and could be considered to be generally in line with the Climate Act. However, if developed it would likely to be available out to 2050, meaning its role as a natural gas store would be questionable as gas demand drops significantly beyond 2030. Whereas a gas storage facility with the capability to support hydrogen could offer long-term energy security benefits and be helpful in terms of supporting the development of a hydrogen industry in Ireland.

7.28 Ireland's National Hydrogen Strategy commits to develop long-term hydrogen storage to support the power sector. However, such storage solutions would not be available in the short-term to address energy security needs.

7.29 Currently it remains uncertain as to what the storage requirements for hydrogen would be, in what configurations, and in what locations. Further analysis is required to first determine the precise storage quantities required as part of a wider study assessing the needs of a net zero integrated energy system. In addition to this study, the National Hydrogen Strategy commits to progress, over the coming years, the necessary legislative changes and development of regulatory regimes to facilitate future prospecting and development of underground hydrogen storage solutions.

7.30 Early projects will be progressed where possible in tandem to the committed wider strategic review, and when available, such storage solutions could accelerate the phase out of any interim gas storage solution.

7.31 Having considered these matters the Department recommends:

a) That research is carried out, led by Geological Survey of Ireland, and involving engagement with industry and interested parties on potential sites for hydrogen storage, including consideration of the Kinsale gas fields future capacity.

b) That the onshore pipeline connecting the gas grid to the shore is preserved for potential future uses (hydrogen or cables for example).

Mitigation C: A Third Gas Interconnector to the UK

7.32 A third gas interconnector to the UK, if situated at a different location for both countries would de-risk the single point of failure risk associated with the two current gas interconnectors.

7.33 Ireland already has two gas interconnectors to the UK. These pipelines are in close proximity at some points and are therefore linked to a degree in terms of risk. A third gas interconnector connecting two different parts of the UK and Ireland's gas grids would reduce this risk. The current rules are in place to facilitate the development of such a pipeline if needed.

Energy Security

7.34 From an energy security perspective, this measure would address the infrastructure risk and the sabotage/attack risk. However, it would make no impact on the risk of a lack of availability of supply as creating a new route for gas from the UK would not diversify supply so would not change the almost complete reliance on UK gas that is likely by 2030.

7.35 It also does not allow Ireland to comply with the N1 infrastructure test since the UK is not a member of the EU.

Affordability

7.36 There is presently no economic case for this pipeline meaning a subvention of some nature would be required and, if it were developed, it could result in a significant stranded asset as gas flows decline.

7.37 CEPA suggest such a pipeline could potentially be repurposed as a zero carbon (hydrogen carrier). The National Hydrogen Strategy notes hydrogen exports are not envisioned to have a significant role as a form of hydrogen demand until at least the mid-2030s. Additionally, while Ireland has significant potential to produce hydrogen for export in the long-term, numerous other countries are also exploring opportunities to export renewable hydrogen. Further assessment on market dynamics and broader policy levers are required to better assess the competitiveness of Irish produced renewable hydrogen compared to international price benchmarks and the benefits that a future hydrogen export market could deliver to the Irish economy.

Sustainability

7.38 The option could facilitate long-term use of natural gas and support a larger gas market in the near term, impinging on Ireland's long-term decarbonisation targets, and potentially be inconsistent with the requirements of the Climate Act.

7.39 However, although future repurposing of a third gas interconnector as a hydrogen carrier would be more in line with Climate Act objectives, while work is underway to assess Ireland's potential export market opportunities, this has yet to be determined.

7.40 Having considered these matters, the Department does not recommend this policy measure.

Mitigation D: Permanent Onshore LNG Facility

7.41 An onshore terminal is usually comprised of berthing facilities i.e., a jetty to allow ships to deliver the LNG, onshore storage tanks for storing the LNG, regasification facilities to turn the LNG back into its gaseous state and gas distribution into the domestic network. LNG is natural gas that has been cooled, changing it from a gas into a liquid that is approximately 1/600th of its original volume. The terminal could also include direct liquefaction facilities, though this is not common. The additional CEPA analysis, following the public consultation, included an option with liquefaction facilities to allow gas to be imported from the interconnectors via Moffat, liquefied and then stored as LNG.

7.42 An onshore LNG terminal can provide a short-term response (depending on level of gas in the storage tanks) in case of supply problems and following the securing of additional LNG cargoes, an alternative flow of gas from a global market.

7.43 The May 2021 Policy Statement on the Importation of Fracked Gas states that "…. pending the outcome of the review of the security of energy supply of Ireland's electricity and natural gas systems, it would not be appropriate for the development of any LNG terminals in Ireland to be permitted or proceeded with". There would need to be a change in policy for any LNG facilities to be developed in Ireland.

Energy Security

7.44 From an energy security perspective this option would address the security of supply risks presented, and ensure Ireland meets the N-1 infrastructure test. Although while dependent on individual projects, the capacity of an onshore LNG terminal is likely to go beyond the security of supply needs Ireland would require. It would likely require imposing a minimum storage obligation either through regulation, licencing or other policy mechanisms to ensure gas is available at short notice, such an obligation could differ through the year.

Affordability

7.45 An onshore terminal offers a permanent and high-capacity solution with relatively low daily operating costs; however, they are relatively expensive to build and offer less flexibility than an FSRU in respect of relocation. Although individual projects vary considerably, it is estimated that onshore terminals can take three to five years to build[20].

7.46 If provided by commercial means associated capital costs can be assumed to be met at industry's expense. Should the State seek to impose minimum storage obligations, there may be costs associated from potential contractual arrangements, which could then impact costs to gas customers.

Sustainability

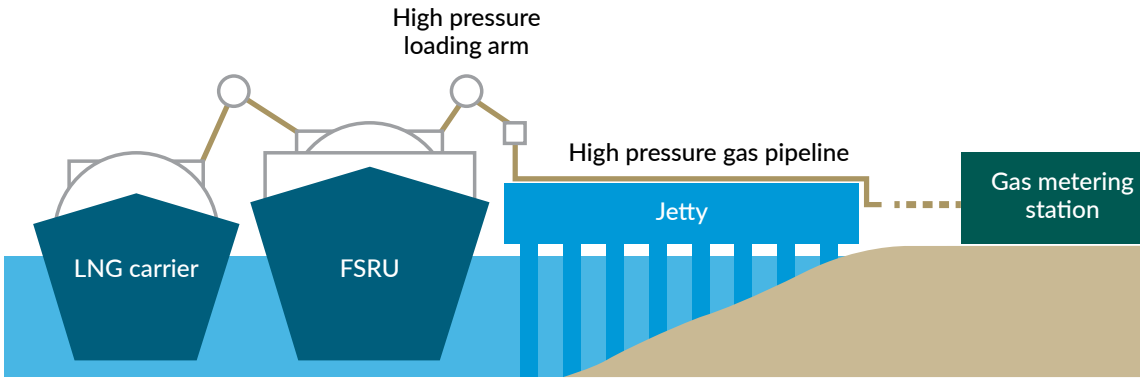
7.47 CEPA note the additional energy requirements associated with LNG relative to natural gas supplies (including liquefaction, transport, and re-gasification) mean that the embedded emissions in LNG can exceed that of natural gas. From a climate perspective the direct emissions that fall within Ireland's carbon budgets are therefore likely to increase, although by a relatively small amount overall. An equivalent reduction in the UK's LNG terminal emissions is likely to be experienced assuming that supply is displaced by LNG imports directly to Ireland. CEPA also advise that the introduction of the terminal is not likely to result in an increase in upstream emissions as any deliveries to Ireland will be offset by reduced deliveries to the UK. However, CEPA signal that a new import facility could encourage further gas demand growth, although this can be mitigated by demand side policy measures.

[20] Hellenic Shipping News, Floating Storage and Regasification Units

7.48 A fixed LNG terminal is permanent in nature, and is a long-term commitment in fossil infrastructure, meaning a significant risk of stranded assets beyond 2030 as gas demand decreases. As an LNG terminal cannot presently be built as hydrogen ready, this measure may challenge domestic and regulatory compliance including the Climate Act.

7.49 Having considered these matters, the Department does not recommend policy measures to support a fixed LNG terminal.

Mitigation E: Offshore Gas Emergency Reserve



7.50 An offshore LNG terminal is the same as an onshore terminal except the storage and regasification facilities are on a ship, known as a Floating Storage and Regasification Unit (FSRU), moored to a jetty. An LNG tanker will arrive and transfer the gas to the FSRU for onward use when required. The FSRU is not a permanent fixture and can be removed. Some variations of this are possible, where for example the regasification facilities are located onshore.

7.51 While any critical energy infrastructure, like an onshore terminal, can be a threat for terrorist attacks, establishing a diversity of supply sources provides insurance against the risks of infrastructure failure or the risk of a sabotage/attack on main gas infrastructure.

7.52 Introduction of this policy measure would require a change in policy which presently does not allow for the development of LNG facilities.

Energy Security

7.53 From an energy security perspective this option would address the security of supply risks presented and meet the N-1 infrastructure standard. Although it would likely require a minimum storage obligation to ensure gas is available at short notice. Such an obligation could differ through the year as gas demand is lower in the summer than the winter.

7.54 While the size and capacity of an FSRU can vary, an FSRU would likely have lower storage volumes than an onshore terminal but is still considered to have sufficient capacity to address and meet Ireland's security needs.

7.55 An FSRU can offer a faster to market solution to an onshore LNG importation terminal. There has been a notable trend in Europe towards floating offshore terminals given their ability for redeployment and speed to market compared to onshore facilities, following heightened geopolitical tensions.

7.56 Converting an existing LNG tanker to an FSRU can take as little as 18 to 24 months[21] while delivering a new build FSRU can take up to three years. The least time-consuming option for securing an FSRU would be to redeploy and charter-in an existing FSRU to a new location, where units are available.

7.57 Given the increased demand and limited global FSRU availability already, competition for any future developments is expected to remain.

Affordability

7.58 Although the cost of purchasing a new FSRU is similar to the cost of converting an existing vessel; purchasing a new vessel gives one the flexibility to tailor specifications such as capacity for the specific project.

7.59 A FSRU is less capital intensive than the fixed option, although operating costs are likely to be higher. Low utilisation could imply a high cost per unit of gas imported.

Sustainability

7.60 The climate assessment for a FSRU is the same as a fixed terminal (including not yet hydrogen ready technology), with one key difference. The terminal can be leased for a number of years then easily removed in the future. This is particularly advantageous when gas demand is expected to drop significantly through the course of the decade from 2030 and production of renewable gases are set to increase as well as the introduction of renewable gas compatible storage. This would enable security of supply benefits to be delivered without committing to a long-term dependence on natural gas while also reducing the risk of stranded assets.

Recommendation

7.61 On the basis of a preliminary review, the Departmemt has identified an offshore Gas Emergency Reserve for use in the event of a disruption (provided through an FSRU) as an appropriate measure to address the identified risks to our gas security of supply, likely more feasible for implementation in the timeframe required, while also being compatible with the Climate Act requirements.

[21] Hellenic Shipping News, Floating Storage and Regasification Units

8. Implementation of an Offshore Gas Emergency Reserve

8.1 This section sets out different issues for consideration in the delivery of a transitional FSRU in Ireland.

Location

8.2 The appropriate location will need to have:

- access to the gas network
- a coastal site suitable for development
- sheltered deep-sea access
- ensure that the receiving environment is capable of accommodating the required infrastructure, having regard to environmental considerations
- proximity to high energy use clusters and future hydrogen production should also be considered and would be a further advantage.

8.3 There is a limited number of locations in Ireland that are likely to meet the required site conditions for berthing a transitional FSRU.

Costs

8.4 An Offshore Gas Emergency Reserve Facility comprises several key components:

- Gas and electricity grid connections
- Metering, pressure and flow control systems
- A jetty
- A floating storage and regasification unit (FSRU) to store gas
- Liquefied Natural Gas is then delivered by LNG tanker and injected into the FSRU for storage.

8.5 FSRU's can vary considerably in size and can be procured through several means:

- constructed as a new build
- conversion of an existing LNG carrier
- redeployment of an existing unit.

It is also possible to have a small Floating Regasification Unit, which would likely require a separate Floating Storage Unit, not necessarily at the same location.

8.6 An FSRU can be procured using different means, typically through direct purchasing of a unit or through a lease type arrangement.

The upfront cost of a FSRU is likely to vary depending on global supply and demand for such assets, in addition to the project specific considerations referred to above as well as the scale of onshore infrastructure required to connect the FSRU to the onshore transmission pipeline. Demand for FSRUs has greatly increased following Russia's invasion of Ukraine in February 2022.

8.7 The above factors mean that it is difficult to estimate the cost of a hypothetical FSRU project with any degree of certainty, and existing projects have varied widely in costs.

Public Acceptance

8.8 Large energy infrastructure projects in Ireland have historically been challenging to deliver, problems arise at the consenting stage due to site selection bias that doesn't adequately consider physical or environmental constraints at the earliest stage of the project development. The selection of an appropriate location through a rigorous process that places adequate weighting on environmental constraints/effects will be a considerable factor to avoid potential delays in the timeframe for development which is required to meet security risk needs assessed.

8.9 Early, open, transparent and meaningful engagement with the local community can also significantly mitigate project delivery risk at both the consenting stage and any subsequent legal challenge to same. Similarly, appropriate engagement with wider, national level groups, can also mitigate similar risks to delivery. Any such engagement would include adequate communication of the site selection process and a demonstration that the process was holistic and adequately considered a wide range of potential perspectives. Stakeholder engagement is, therefore, seen as critical in progressing any project.

8.10 It takes Ireland five years currently to complete large energy infrastructure. Subject to instruction from Government, the Department will examine all opportunities to accelerate implementation on the basis of its strategic importance to the State including legislative supports at EU and national level, planning and consenting considerations as well as acknowledging operational conditions which can support fast-tracking development such as appropriate location, grid access and infrastructure procurement.

Commercial versus Strategic

8.11 A transitional FSRU facility could be operated in a strategic or commercial manner. In both cases the ownership and operation of the plant could be a private entity or a State-owned entity, such as the gas transmission system operator (TSO).

8.12 The Department engaged CEPA to carry out a further assessment to consider the differences in commercial versus strategic operations against the criteria of security of supply, affordability and sustainability. The analysis used a FSRU terminal for the purposes of assessing a commercial option and an onshore terminal for the strategic option. However, the offshore floating terminal could also be used in a strategic manner and the findings of the report allow for this to be assessed.

8.13 Table 8.1 below sets out the Department's assessment of a strategic versus commercial delivery of an FSRU using the CEPA analysis as a key input.

Table 8.1: Department's assessment of a strategic versus commercial delivery of an FSRU

	Commercial	Strategic
	Security of Supply	
Immediate Response	There is no level of assurance of gas in stock with a commercial FSRU. However, there is potential to impose a minimum storage level requirement on shippers/ suppliers in winter (approach taken in Spain on a tiered monthly basis). If the FSRU working capacity is 50% full, then peak gas demand can be met in the event of a disruption to IC2 gas supplies for approximately a week. Depending on the level of storage obligation then the FSRU owner may seek compensation.	The level of gas in stock can be assured by filling pre-winter as strategic stocks which will be used in an emergency only. Due to boil off of stock levels, the requirement to restock the FSRU is dependent on its overall storage capacity, but this may be required before each winter.

continued

	Commercial	Strategic
Securing new deliveries	Gas will be delivered in accordance with market signals. If Ireland is facing shortages due to an infrastructure failure or attack/sabotage then it is likely that gas will be available as this is not a global market event.	CEPA note that the availability of LNG at short notice may be more challenging under the strategic option as the normal market commercial arrangements are not likely to be in use. However, if Ireland is facing shortages due to an infrastructure failure or attack/sabotage then it is likely that gas will be available as this would not be a global market event.
Delivery Risk	Large energy infrastructure projects in Ireland have historically been challenging to deliver. While a site for an FSRU may be at a reasonably advanced stage of development e.g., with a suitable site secured, design complete and permitting progressed, there is still a possible risk of delay to the development of any infrastructure due to opposition.	Large energy infrastructure projects in Ireland have historically been challenging to deliver. Delivery of a strategic option will require consents (with necessary studies) to be secured and appropriate contractual arrangements put in place, which will take a number of years. However, a strategic option may face less opposition as sustainability impact is likely to be less and the project is transitional in nature.
Exit Risk	CEPA highlights that the risk to revenue recovery by the commercial FSRU in Ireland could result in a request for public support and/or generate a risk that a commercial FSRU would exit the Irish gas market. This would not be directly within the State's control.	The risk of an early departure is not present in the case of a unit delivered in a strategic manner.
Affordability		
Direct costs	While CEPA do not expect the development of a commercial FSRU to generate any additional costs for Irish consumers, there may be some costs associated with putting in place minimum storage obligation depending on how the storage gas is paid for.	A unit could be purchased or leased. The cost of a strategically operated terminal would need to be recovered directly, although it's possible that EU funding could be sought. Further information is set out in Section 8.16 to 8.26 below. It is noted that the cost of this insurance policy is a small percentage of the impact of a cessation of gas supplies from the UK.
Stranded Asset	There is a minor stranded asset risk associated with parts of a commercial FSRU project given the expected natural gas demand reduction in Ireland in line with the Government's net zero commitments. While the FSRU itself would be capable of transferring to another location once it is no longer needed in Ireland, part of the onshore infrastructure (e.g., the jetty and onshore connecting pipeline infrastructure) would remain. This risk would lie with the developer.	Risk is considered largely equivalent with commercial option, although the State may face the stranded assets risk.

continued

	Commercial	Strategic
	Sustainability	
Direct Emissions	CEPA identify that the lifecycle emissions intensity of LNG exceeds that of pipeline natural gas due to the energy-intensive steps associated with the liquefaction, tanker transport, and re-gasification. CEPA estimate that the commercial operation of an FSRU in Ireland would likely generate emissions within a range of 70,000 to 80,000 tonnes t CO_2e per annum, equivalent of 2% of the electricity sectoral emission ceilings budget.	The direct emissions from operating the terminal strategically should be less than the commercial option given much lower operational activity.
Indirect Emissions	CEPA note that the direct importation of LNG to Ireland may not necessarily result in additional material environmental impacts on a global basis, especially given the size of the Irish gas market relative to global LNG production.	There is little risk that a strategic terminal would instigate new LNG production.
Gas Demand	CEPA also highlight that a commercial terminal may stimulate higher gas demand in Ireland whether by price impact or through offering increased security of supply. They note that this risk can be addressed through demand side policy measures. The State would not have control over the departure of the unit as Ireland's transitions to a net-zero economy.	No impact on gas demand other than as provided for use as strategic stocks increased security of supply. The State maintains control of the unit's departure when no longer required.

Treatment of Boil-off Gas

8.14 Natural evaporation, known as boil-off, is unavoidable when natural gas is liquified, and the generated boil-off gas (BOG) must be removed to preserve the tanks' pressure. Typical boil-off rate from an FSRU is 0.15% of weight per day. Rather than flare or release the BOG into the atmosphere, normal practice is to utilise the gas by flowing it into the gas network, including the possibility of using gas as part of the balancing needs of the TSO.

- In the case of a strategically operated FSRU this issue means a replenishment of the tanks would be required, most likely before the commencement of each winter. To effectively and sustainably manage BOG, a mechanism will be put in place to allow suppliers or the TSO to purchase the gas. The flow of gas into the network from the strategic gas reserve will provide an opportunity to recover the value of the gas and offset a portion of overall costs associated with the annual operating costs of the facility.

Financial Capability to Deliver Options

8.15 The capital and operational costs to design, construct and operate the terminal are considerable and will require significant funding.

8.16 It would be the responsibility of a private company to secure the necessary funding for a commercial operation. Several of the companies who have an interest in developing a terminal in Ireland have evidence of developing such terminals elsewhere.

8.17 The Department engaged NewERA for advice on GNI's capability to carry out a strategic project and NewERA concluded the following on the basis of a larger, more expensive onshore facility:

"subject to an appropriate regulated remuneration mechanism and, particularly, GNI's assumed level of EU grant funding (the application for which GNI has acknowledged would need to be on an exceptional basis), GNI would likely be able to finance the GNI Proposal if it is deemed the most appropriate option from a policy perspective. Given the estimated cost of the GNI proposal and the likely timescale before it would be operational, DECC may also wish to consider other options to address gas/energy security of supply. To the extent DECC determines that State involvement in new gas infrastructure to address security of supply is appropriate (whether in the form of the GNI proposal or otherwise), GNI's 100% State ownership, financial capacity, and track record mean GNI should be well positioned to assist."

In considering funding and financing options for a strategic led project, the following can be noted -

- The project will have upfront capital costs, annual operating costs and costs associated with procurement of the gas for strategic storage. There will be opportunity to recover some of the cost associated with the gas through the market to effectively manage "boil off".
- There are a range of matters that need to be considered that will ultimately impact final cost, such as division between capex and opex costs, potential to optimise EU grant funding if available. The timeframe for recovery may impact options for recovery of costs and ongoing financing.

Cost Recovery of Strategic Option

8.18 Annual operational costs and gas procurement costs associated with a strategic led project could be funded by range of options including through charges levied on Irish energy consumers through a Public Service Obligation (PSO) levy model or tariff structure. CRU as the regulator has responsibility for determining and calculating such scheme structures.

8.19 Applying a gas tariff structure involves cost recovery via the existing tariff structure applied by GNI to recover its capital investment from customers. It uses a tiered structure whereby charges depend on customer annual quantity and volume used. Using a tariff structure would imply costs recovered from gas customers only.

8.20 The level of costs recovered by tariffs, if any, would be a matter for CRU as independent regulator.

8.21 A PSO levy is a fixed charge applied to gas customers and potentially to electricity customers.

8.22 Currently in Ireland there is a PSO levy charged, or payments made to all electricity final customers to fund schemes designed by Government in support of national renewable energy policy objectives. Over a number of years, the PSO has included several schemes, and currently supports the Renewable Electricity Feed-In Tariff (REFIT) and the Renewable Electricity Support Scheme (RESS), which provides support payments to suppliers to contract with eligible renewable generation projects.

8.23 Applying a PSO levy across gas and electricity connections could be considered appropriate given the importance of gas in electricity generation and, particularly, gas generation's ability to address intermittency in renewable energy. Legislative amendments may be required to provide such an arrangement.

8.24 Total gas volumes are forecast to decline over time as a result of the electrification of the economy, but gas peak demand is expected to provide back up when limited renewable generation is available. Therefore, it can be argued that non-PSO revenue models would disproportionately affect domestic gas consumers relative to electricity consumers who rely on gas fired generation's ability to provide an on-demand backup.

8.25 Any costs recovered through customer bills will be dependent on actual costs, funding, and the final allocation mechanism. However, a broad incremental cost could be in the range of 1.5% to 2.5% on customer bills which is in line with current and historic norms of similar levies (e.g., electricity PSO and NORA levy).

Fracked Gas Policy

8.26 In May 2021, the Government approved the 'Policy Statement on the Importation of Fracked Gas' which states "pending the outcome of the review of the security of energy supply of Ireland's electricity and natural gas systems, it would not be appropriate for the development of any LNG terminals in Ireland to be permitted or proceeded with".

The statement remains in place until the review of Energy Security has been completed following consideration by Government on the optimal approach to deliver a Strategic Gas Emergency Reserve in the first half of 2024.

Compliance with EU Energy and State Aid Framework

8.27 The EU energy framework covers the regulation of gas markets and security of supply. This section summarises the key elements of that framework. A specific project once identified would need to fall within the framework's requirements. It is noted that the significant changes to the framework are currently being prepared through the review and revision of the Gas Directive 2009/73/EC and Gas Regulation (EC) No 715/2009. The revised legislative proposals are currently in trialogue negotiations and may be finalised in Q4 2023.

8.28 Private entities are entitled to own and operate LNG facilities under Directive 2009/73/EC, subject to compliance with the relevant regulatory requirements and the principles of non-discrimination, transparency, and competition. Member States must ensure the implementation of Third-Party Access to LNG facilities based on published tariffs, applicable to all eligible consumers.

8.29 Under Directive 2009/73/EC, the TSO is allowed to operate LNG facilities providing certain conditions are met:

- Third party access to the terminal is provided in a non-discriminatory manner;
- That the TSOs operation of the LNG terminal does not create a conflict of interest or anti-competitive effects that would hinder the development of the internal gas market;
- The operation of the terminal does not hinder the security of supply or the ability of market participants to access the gas market.

8.30 Exemptions from certain provisions of Directive 2009/73/EC, such as Third Party Access rules, may be granted for new infrastructure projects for a period of time subject to satisfying the following conditions as set out in Article 36 of the Directive:

- the investment must enhance competition in gas supply and enhance security of supply;
- the level of risk attached to the investment must be such that the investment would not take place unless an exemption was granted;
- the infrastructure must be owned by a natural or legal person which is separate at least in terms of its legal form from the system operators in whose systems that infrastructure will be built;
- charges must be levied on users of that infrastructure; and
- the exemption must not be detrimental to competition in the relevant markets

> which are likely to be affected by the investment, to the effective functioning of the internal market in natural gas, the efficient functioning of the regulated systems concerned, or to security of supply of natural gas in the Union.

As part of the new Gas Package under negotiation, the exemptions criteria have been updated and there is one new criterion to meet in addition to the above list, such that "the investment must contribute to decarbonisation".

The CRU as regulatory authority has the powers to grant or refuse an application for exemption from third party access requirements. The European Commission also has the power to review and potentially reject a national regulatory authority's decision on such matters.

8.31 The Directive requires that any TSO operates an LNG terminal subject to effective and transparent regulation by a competent regulatory authority. No exemptions are available where the infrastructure is owned by a natural or legal person which is not separate at least in terms of legal form from the system operator.

8.32 Unbundling obligations would not apply to a commercial operator as they are not a TSO and therefore no certification would be required. There is no requirement for a TSO to undergo a separate certification process to operate an LNG facility if the facility's operation fall outside the scope of the TSO's existing certification.

8.33 Section 16 of the Gas (Interim) (Regulation) Act 2002 provides for the CRU to grant or refuse a licence to operate an LNG terminal. Amendments would be required to the Gas Act to expand the functions of the TSO to allow them to operate an LNG facility.

8.34 In general terms, a policy option relying on market-based solutions will not engage the State Aid rules. Where the State's role is limited to putting in place the regulatory framework to facilitate commercial suppliers providing LNG, State Aid issues are unlikely to arise.

8.35 Designating the TSO as the sole owner and operator of an LNG terminal could in principle not engage the State Aid rules, if a legal monopoly is established which meets certain requirements:

a) Be established in accordance with EU law (referred to at a high level above)

b) Not compete in any related market with other services (e.g., other gas providers)

c) Avoid cross subsidisation of other functions.

8.36 Given the significant benefits inherent in the granting of a legal monopoly to an entity and the market implications arising, the Department expects that this would be scrutinised very carefully by the European Commission.

8.37 Regulation (EU) 2017/1938 provides safeguards for uninterrupted supply of gas throughout the EU and requires EU Member States to take a risk-based approach to assessing security of supply and establish preventative and mitigating measures to guarantee continued gas supply under very demanding conditions. A Member State's competent authority (in Ireland's case the CRU is the competent authority) is required to undertake a risk assessment and prepare preventative action plans and emergency plans to safeguard the operation of the gas system and ensure compliance with the EU infrastructure standard and security of supply standard as well compliance with any increased supply standard or additional obligation imposed for reasons of security of

supply as referred to in Article 6(2). Where necessary, non-market-based measures may be applied and should be detailed and justified as part of the Member State's Preventative Action Plan. Measures contained in the plans must be clearly defined, transparent, proportionate, non-discriminatory and verifiable.

Recommendation

8.38 Based on preliminary analysis of the Department, it is anticipated that in terms of delivery options, a Strategic Gas Emergency Reserve provided through a storage and importation facility — an FSRU — as the most appropriate approach. This is a solution preferred by a range of EU Member States. This will be a State-led approach. State-led means commissioned by the state via GNI within a regulatory framework overseen by CRU. This does not preclude a public private partnership nor the involvement of private firms contracted to provide, build or operate the necessary infrastructure.

8.39 A State-led approach is considered the most appropriate solution for a number of reasons:

- It is in line with the advice of the IEA and supported by the analysis provided to the Department by CEPA.
- It will address the identified risks to our gas security of supply, providing sufficient gas if there is a disruption to the largest gas infrastructure on a day of considerable high gas demand, i.e., the EU N-1 infrastructure standard.
- It is feasible for implementation in the timeframe required and provides certainty on the delivery and transitional retainment of such infrastructure during this transitional period. A commercially led approach may be less secure with a risk of a departure depending on market conditions.
- While a strategic approach will have associated cost implications, it is noted that as an insurance policy for gas security of supply, it is a small percentage of the impact of a cessation of gas supplies from the UK.
- It will not stimulate higher gas demand against our climate and energy security objectives.
- It is consistent with the Climate Act and broader Government climate and energy policy avoiding the risk of fossil fuel lock-in or stranded fossil fuel assets. Should Ireland fail to achieve required climate targets, it presents a potential risk of costs to the Exchequer.

8.40 The Minister for the Environment, Climate and Communications will bring a memorandum to Government for decision in Q2 2024 following detailed examination and business case development by the gas transmission system operator, Gas Networks Ireland (GNI).

9. Delivery of Strategic Option – Strategic Gas Emergency Reserve

9.1 To deliver a State-led[22] Strategic Gas Emergency Reserve through an FSRU, DECC will establish a number of workstreams:

- **Project Establishment:** engage with GNI as the independent Gas Transmission System Operator (TSO) to prepare a detailed proposal by Q2, 2024 to introduce a reserve in line with criteria and requirements determined by DECC which will include:
  (i) a proposal which can be implemented quickly
  (ii) a proposal which does not inadvertently increase gas demand by increasing the supply available on the market
  (iii) a cost-effective proposal at the appropriate scale which provides sufficient resilience if a disruption to gas supply occurs
  (iv) a proposal which is compatible with the Climate Act 2021.
- **Primary Legislation:** Introduction of primary legislation to address a range of matters including:
  (i) Amend Gas Act 1976 to update the functions of GNI to specifically refer to the development, construction, operation, and maintenance of a Strategic Gas Emergency Reserve, including arrangements for transactions relating to strategic gas storage
  (ii) Make any appropriate legal amendments to the consenting process necessary having reviewed the supporting legal framework.
- **Funding Arrangements:** Funding arrangements for GNI would need to be identified and agreed. As outlined in Section 8, on the basis of general market borrowing, recovery of such costs could be through a PSO levy model or tariff structure. Depending on the recovery model chosen, legislative changes may be required. This may also include the identification of any relevant EU supports.
- **EU Regulatory approach:** Engagement with the European Commission and the CRU on the approach to EU legislative compliance.

9.2 The Minister for the Environment, Climate and Communications will bring a memorandum to Government for decision in Q2 2024 following detailed examination and business case development by the gas transmission system operator, Gas Networks Ireland (GNI).

[22] State-led means commissioned by the state via GNI within a regulatory framework overseen by CRU. This does not preclude a public private partnership nor the involvement of private firms contracted to provide, build or operate the necessary infrastructure.

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