Commission for Energy Regulation
An Coimisiún um Rialáil Fuinnimh

Common Arrangements for Gas
Security of Supply

Consultation Paper
19th December, 2008

Utility Regulator
ELECTRICITY GAS WATER

Contents

1 Introduction

In April 2008, the Commission for Energy Regulation ('the Commission') and the Utility Regulator jointly published a Memorandum of Understanding (MoU) on the development of the Common Arrangements for Gas (CAG) project, under the All-island Energy Market Development Framework. The CAG project involves a series of measures designed to allow gas transmission networks in Ireland and Northern Ireland to be operated on a single all-island basis. It will allow stakeholders to effectively buy, sell, transport, operate, plan, and develop the natural gas market north and south of the border. This means that variations in the price and conditions in which gas is bought and sold will be determined by market conditions and economics, not by variations in regulatory arrangements.

As part of CAG, both jurisdictions aim to harmonise their gas markets and security of supply arrangements prior to CAG implementation in 2010. This consultation paper examines the security of supply arrangements currently in place in Ireland and Northern Ireland and provides a framework for how these will be addressed under the CAG project. This paper also serves as a consultation document for those areas related to Security of Supply which are not being addressed under an existing CAG workstream. These are Security Standards, Supplier Obligations and Storage. This consultation seeks comments on the possible future security of supply arrangements under CAG for these specific areas.

The security of supply situation facing Ireland and Northern Ireland in the coming years is dynamic and is subject to the developments not only in Europe but also worldwide, posing challenges for investors and policy makers. A number of events have the potential to directly improve all-island security of supply such as the outcome of Celtic sea exploration and gas storage projects, Atlantic exploration, the delivery of Corrib gas, Shannon LNG, and storage in salt layers at Larne in Northern Ireland.

The ability of Ireland and Northern Ireland to mitigate the effects of gas shortages is dependent on putting in place a robust security of supply framework. This will lower the risk of emergencies occurring and minimise the impact should they arise. This paper has identified key areas of the frameworks and discusses how they are currently incorporated into the respective markets. It is clear that there are inconsistencies between the approaches in Ireland and Northern Ireland. The CAG project provides an opportunity to align the framework and gain from a synergistic approach.

1.1 Framework for Security of Supply Issues

This paper highlights the areas where harmonisation under CAG would be appropriate and describes how they will be addressed in the security of supply or other work-streams of the CAG project.

These areas making up the Security of Supply framework are specifically:

1. **Emergency Procedures**

   The extent to which emergency procedures need to be harmonised will be addressed. An emergency working group will be established to examine the issue. Arrangements may be provided for in a common code of operations**.** It is proposed that this is to be progressed through the CAG operations workstream.

2. **Network Security Standards**

   The standards to which the network should be built are considered in this consultation paper. This includes the harmonisation of definitions of the standards**.**

3. **Obligations on Shippers/Suppliers and Other Market Participants**

   This consultation paper also looks at the issue of supplier and shipper obligations and arrangements that may need to be made for compensating participants for losses for complying with the National Gas Emergency Manager**.**

4. **Gas Storage**

   The security of supply consultation will also address the issues of strategic and commercial storage. The Joint Steering Group sub-committee on security of supply will address strategic storage at the policy level.

5. **Gas Quality**

   An industry working group is currently looking at the issue of gas quality and a final report outlining the findings and recommendations of the Group has been completed. The Regulatory Authorities have published a Decision Paper implementing these findings.

6. **UK NTS Exit Reforms**

   The Regulatory Authorities are currently engaged in joint discussions with Ofgem regarding the UK exit reforms and how the potential threat to security of supply can be mitigated. Industry workshops for all participants downstream of Moffat are being organised to discuss options and formulate a common position.

7. Planning and Development Framework

The CAG work programme calls for annual joint Gas Capacity Statements, the first of which is scheduled for 2009. A harmonised network security standard should emerge from the security of supply consultation and this can be used as a basis for modelling work required to underpin future analysis. The work programme further calls for a joint Planning and Development Framework. The decision paper on the Security of Supply and the Gas Capacity Statement will be a key component of the planning and development framework. The CAG consultation on the planning and development framework is scheduled for November 2009.

The timelines for each of the elements considered within the CAG SoS framework will be presented in the CAG workplan.

As highlighted in this report, responsibilities for security of supply differ in Ireland and Northern Ireland. To address this, a Joint Steering Group sub-committee on security of supply has been established comprising government and regulatory representatives from Ireland and Northern Ireland. The security of supply work-stream of the CAG project will be working in tandem with the sub-committee.

1.2 Structure of the Paper

Section 2

This section provides a background into supply and demand in both jurisdictions and outlines current demand and the demand forecast to 2014/15 for gas in Ireland and Northern Ireland. The current sources of supply are examined, along with potential future sources and the implication these have for security of supply.

Section 3

This section outlines the European, Irish and Northern Irish legislation that underpins security of supply.

Section 4

This section provides background to the work areas that feed into security of supply for Ireland and Northern Ireland as outlined above. Areas where security of supply work is already being done under the CAG are highlighted. Areas where further work is required are identified and these are the subject of the consultation in section 5.

Section 5

This section focussed on the three areas which are not being covered under other CAG workstreams. These are Security Standards, Supplier Obligations and Storage. A number of questions are posed to which consultees are asked to respond.

1.3 Summary of Consultation Questions

1. Should an obligation be placed on network operators to build and maintain the network to a 1-in-20 or a 1-in-50 peak-day?

2. Is a period of five days appropriate for the period for which supplies to domestic customers must be protected in the event of a partial disruption to national supplies?

3. Does a peak-period (as specified in 19A (1)(c)(ii) of the 2002 Act) need to be specified? Or does a 1-in-50/1-in-20 peak-day imply a sufficient period for this purpose?

4. Are there additional minimum standards required for other energy undertakings or offshore producers?

5. Should shippers/suppliers be required to book peak-day/severe winter capacity for a 1-in-50 or a 1-in-20 for peak-day? What costs would be incurred by shippers/suppliers in order to meet such proposed requirements?

6. Should shippers/suppliers be required to secure supplies for a 1-in-50 annual demand or a 1-in-20 for peak-day? What costs would be incurred by shippers/suppliers in order to meet such proposed requirements?

7. Should obligations be placed on shippers/suppliers ensuring minimum levels of diversity in their contracted sources of supply?

8. Should obligations be placed on shippers/suppliers relating to long-term contracts?

9. Are shipper/supplier obligations best provided for through licence conditions or through the Code(s) of Operations?

10. Should storage operators be required to hold minimum levels of storage?

11. Should shippers/suppliers be required to hold minimum levels of storage?

12. Should storage stocks in GB storage facilities be considered an appropriate security of supply measure?

13. Would obligations in relation to storage distort the Irish gas market?

14. Are there sufficient incentives in place for the commercial provision of adequate storage?

1.4 Responses to Consultation

The Commission and the Utility Regulator invite comments on any aspect of this paper and/or provide responses to the specific questions of the consultation. The RAs are also interested in any detailed cost implications respondents may have about the proposed options. Respondents are asked to submit their comments by close of business Friday 30th January 2009 to

Robert O'Rourke
(rorourke@cer.ie)
Gas Division
Commission for Energy Regulation
The Exchange
Belgard Square North
Tallaght
Dublin 24

Richard Hume
(richard.hume@niaur.gov.uk)
Gas Directorate
Utility Regulator
Queen's House
14 Queen Street
Belfast
BT1 6ER

2 Island of Ireland's current gas outlook

This section provides background into current consumption levels and the situation regarding sources of supply for Ireland and Northern Ireland. Consumption is due to increase, although, due to the economic downturn and price increases, is now forecast to do so at a lower rate than before.

At present, both jurisdictions are very similar in terms of their reliance on Great Britain (GB) for gas imports through interconnection and their lack of indigenous gas production. The proposed LNG terminal at Shannon and indigenous production from Corrib will provide significant contributions to the diversification of the island's sources of supply. The proposed gas storage facility at Larne would also bolster security of supply. However, if no further discoveries are made in either Ireland or Northern Ireland, both jurisdictions may in the medium term be very much reliant on interconnection with Europe through GB.

2.1 Historic and forecast energy consumption

Ireland's consumption of natural gas is increasing annually and with little indigenous supplies, is heavily dependent on gas imports to meet demand. Northern Ireland is in a similar position to Ireland regarding increasing demand for gas as a fuel and dependency on import for supply from GB and continental Europe. Ireland has a high dependency on gas fired electricity generation and a relatively low level of gas storage capability, further compounding vulnerability to a disruption in gas supplies. Similarly, Northern Ireland is exposed to a lack of diversity of supply sources, high dependence on gas for power generation and additionally no gas storage facilities.

Ireland's annual consumption of natural gas increased by 80% from 1998 to 2006, despite the closure of a major gas load at Irish Fertiliser Industries near Cork in 2003. The power sector is the largest consumer of natural gas, followed by industrial and commercial (I&C), then residential customers. Table 1 shows Ireland's gas consumption by sector for 2006/2007.

Table 1: Ireland Natural Gas Consumption by Sector 06/07 [1]

Sector	**Natural Gas Consumption 06/07 (mcm)**
Power Generation	3140
Residential	698
Industrial & Commercial	949
Own Use & Losses	70
TOTAL	4857

Demand for gas is forecast to rise between now and 2014, with total consumption expected to increase from 4956mcm in 2008/09 to 5847mcm in 2014/15[2].

The Northern Ireland gas industry is less mature than Ireland, however the demand for gas is increasing as the industry continually develops. The gas fuelled power stations of Coolkeeragh and Ballylumford account for 80% of total gas consumption, highlighting the dependency of electricity generation on gas supply. Table 2 presents the breakdown of gas consumption in Northern Ireland by sector.

[1] Commission for Energy Regulation, *Gas Capacity Statement* 2008, Table 3.1, pg 19.

[2] Commission for Energy Regulation, *Gas Capacity Statement 2008*, Table 3.5, pg 33

Table 2: Northern Ireland Natural Gas Consumption by Sector 06/07

Sector	**Natural Gas Consumption 06/07 (mcm)**
Power Generation[3]	1362
Residential[4]	115
Industrial & Commercial[4]	201
TOTAL	1678

Table 3 shows forecast gas consumption by sector in Ireland for 2014/15 (not including Own Use & Losses)

Table 3: Ireland Forecast Natural Gas Consumption by Sector 2014/15[5]

Sector	**Natural Gas Consumption 2014/15 (mcm)**
Power Generation	3830
Residential	904
Industrial & Commercial	1113
TOTAL	5847

Due to the general economic downturn in Ireland in 2007/08, it should be noted that the peak day demand forecasts for this Gas Capacity Statement are lower than those predicted in previous statements. Peak day demand is

[3] The Utility Regulator CAG Tariff Transmission Forecast Model

[4] The Utility Regulator Phoenix and Firmus Price Control figures

[5] Commission for Energy Regulation, *Gas Capacity Statement 2008*, Tables 3.2-3.5.

forecast to increase from 30mcm/d in 2007/08 to approximately 38mcm/d in 2014/15[6].

Demand for gas in Northern Ireland is forecast to rise significantly between now and 2015, with total consumption expected to increase from 1678 mcm to 2491 mcm. Table 4 shows the forecast natural gas consumption by sector in Northern Ireland for 2014/15 (not including Own Use and Losses).

Table 4: Northern Ireland Forecast Natural Gas Consumption by Sector 2014/2015

Sector	**Natural Gas Consumption 2014/15 (mcm)**
Power Generation[3]	1998
Residential[4]	209
Industrial & Commercial[4]	284
TOTAL	2491

2.2 Level of gas fired generation

The share of gas in electricity generation in Ireland has risen from 48% in 1998 to 64% in 2007. Electricity generation is the main driver of Ireland's increasing gas consumption, and this is set to continue. EirGrid's Generation Adequacy Report 2007-13 states that if two new Combined Cycle Gas Turbines (CCGTs) are commissioned as planned in the south-west, then gas-fired generation will represent 67% of fully dispatchable generation capacity in 2013. Electricity generation accounts for 80% of Northern Ireland's annual gas demand through Coolkeeragh and Ballylumford power stations. Similar to Ireland, this proportion may grow as the remaining old oil-fired power station, Kilroot, considers switching to a new CCGT. The share of gas-fired electricity generation in Ireland and Northern Ireland is very high by European standards. The average gas share of generation in the 27 EU countries is 24% (as of 2004), although this is forecast to increase.

[6] Commission for Energy Regulation, *Gas Capacity Statement 2008,* pgs 49-53.

The development of significant renewable electricity sources on the island of Ireland, particularly wind, should help offset the heavy dependency on fossil fuel generation. However, as most new renewable generation will come from wind which is relatively unreliable, backup from mid-merit and peaking conventional generation will be required. These stations tend to be gas fired CCGT or OCGT (Open Cycle Gas Turbine) plant. The need for gas-fired generation will therefore increase and as the load factor of these units will be low, the cost per unit of energy generated from these units will be high.

The DCMNR's 2007 White Paper envisages a target of no more than 50% of electricity from gas-fired generation by 2020 if the target of 33% wind generation is achieved.

2.3 Sources of Gas Supply

Russia is currently the largest exporter of gas to the EU, supplying approximately 23% of the EU's total supply. Norway and Algeria are the next largest exporters, supplying 18% and 10% of total supply respectively[7]. Russia's share of imports is set to continue to rise and is expected to reach 60% by 2030. The EU's gas imports are forecast to increase to 80% of its total gas supplies by this time[8] so Russia will be supplying 48% of total supply. Ireland and Northern Ireland are at the end of Europe's gas supply infrastructure so their geographic position makes them vulnerable to any disruption in supplies (whether for geopolitical reasons or due to an infrastructure incident); particularly when Norwegian and Danish production reduces significantly. To ensure security of supply the EU must diversify its supply sources through new LNG terminals and the construction of new supply pipelines such as the Nabucco pipeline to the Caspian and Middle East regions.

At present, imported gas through interconnection represents over 90% of the gas used in Ireland. All imports currently come to Ireland from Great Britain (GB) via the two interconnectors (IC1 and IC2) from the national entry point at Moffat and Beattock. Indigenous gas production from the Celtic Sea has decreased significantly – from a peak supply of 52% of total Irish demand in 1998 to less than 10% of total demand in 2007. Current average Celtic Sea production of approximately 1 mcm/d will continue to decline for the next few years. Corrib reserves are estimated to be around 24 billion cubic metres

[7]Euractiv.com, 26th March 2008 *Liberalisation of the EU Gas Sector [accessed 5th August 2008]:* http://www.euractiv.com/en/energy/liberalisation-eu-gas-sector/article-171067

[8] EurActiv.com

(bcm). When the Corrib gas field comes online (expected in time for winter peak 2009/10) total indigenous production should rise to a peak of 13 mcm/d, but only for three years as the Corrib production profile shows maximum production for the first three years followed by a relatively rapid decline[9].

Natural gas supply to Northern Ireland is solely through the Scotland Northern Ireland Pipeline (SNIP) from the national entry point at Moffat. It is estimated, however, that the use of the southern ICs and onward transmission via the South-North (SN) pipeline will be required to meet future increased demand in Northern Ireland.

Commercial storage is important for the operation of a competitive gas market and provides flexibility for shippers and ultimately reduced prices for customers. Ireland's only gas storage at Kinsale is operated on a commercial basis. Generally gas is injected in the summer when prices are lower and are withdrawn in the winter. The facility can accommodate 6mscm of gas and the withdrawal rate is 2mscm/day. The future of Marathon's facility is uncertain at the moment as the site is currently for sale.

There are currently two parties examining the possibility of gas storage at the salt deposits in Larne in Northern Ireland. These could be used for both commercial storage and strategic storage, if this were considered desirable and cost effective. The timeframe for operating such a facility could be as early as 2014/15 and this would help alleviate the current lack of gas storage on the island.

The establishment of LNG facilities is seen as the way forward in Europe for diversifying supply. In 2006, LNG imports represented an 11% share of the total gas market in the EU[10]. The share of LNG in EU gas supplies is forecast to rise from 7% in 2004 to 15-18% in 2020[11]. The island of Ireland currently has no LNG import capability but Shannon LNG has been awarded planning permission for a LNG import facility and terminal on the south bank of the Shannon Estuary between Tarbert and Ballylongford in County Kerry. If the project goes ahead, it is estimated that LNG supply from the facility will be

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[9] Commission for Energy Regulation, *Gas Capacity Statement 2008*, Appendix A, Tables A1-A8.

[10] Eurogas.org, 13th March 2008 *Natural Gas Demand and Supply [accessed 5th August 2008] online:*
:http://www.eurogas.org/uploaded/Eurogas%20long%20term%20outlook%20to%202030%20-%20final.pdf

[11] Eurogas

available for the winter peak of supply year 2012/13. It is anticipated that it will be able to provide over 17% of the island of Ireland's peak day demand, based on this years forecasts[12].

The projected shortfall between annual peak gas demand (38.86 mcm/day for Ireland and Northern Ireland) and indigenous peak gas supply (3.78 mcm/day maximum from storage and production through Inch) is about 35.08 mcm/day[13] for the 2007/08 year. This shortfall is essentially made up by imports from GB via the two southern interconnectors and the SNIP. The estimated peak day shortfall for the island of Ireland will fall to about 25.19 mcm if the Corrib Gas Field comes online in 2009/10[14].

If all sources of gas supply come online by 2012/13 (Larne storage, Corrib, LNG etc) and the demand forecast is similar to that predicted, the ICs (SNIP and two ROI ICs) could supply less than 33% of the all-island demand. All of the island of Ireland's *average* day gas consumption could be met by indigenous production and LNG, although this relative independence from imports through the ICs would be short-lived in the event that no further indigenous resources are found[15]. This infers that Ireland, Northern Ireland and the Isle of Man will be largely dependent on imports from GB to meet gas demand for the foreseeable future, although there is the possibility of new discoveries in the Atlantic margin and there are currently ventures looking for licences to explore off the Irish coast.

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[12] Commission for Energy Regulation, *Gas Capacity Statement 2008*, Appendix A, Tables A1-A8.

[13] Commission for Energy Regulation, *Gas Capacity Statement 2008*, Appendix A, Tables A1-A8

[14] Commission for Energy Regulation, *Gas Capacity Statement 2008*, Appendix A, Tables A1-A8

[15] Commission for Energy Regulation, *Gas Capacity Statement 2008*, pgs 49-53, Figures 5.2-5.5.

3 Security of Supply Legislation

In the following sections the EU legislative and initiatives in relation to security of supply are discussed and the legislative requirements for Ireland and Northern Ireland are outlined. The roles and responsibilities of the regulators in both jurisdictions are highlighted. These responsibilities include ensuring sufficient supply and capacity on the network during peak use times and ensuring security of supply for domestic customers in the event of a supply disruption.

3.1 Directive 2004/67/EC

European Directive 2004/67/EC "Concerning measures for safeguarding the security of natural gas supplies" places obligations on Member States for ensuring gas security of supply. The need to have common arrangements for security of supply for Member States is highlighted, especially as the EU becomes increasingly reliant on imported gas to meet its energy needs. The definition of clear roles and responsibilities for all market players is necessary for ensuring security of supply and a well-functioning internal market. The delegation of responsibility for security of supply has been left to the discretion of each Member State.

General security of supply instruments which a Member State may consider including minimum targets for gas storage, and long-term contracts. The Directive also provides for the establishment of the Gas Coordination Group and solidarity between member states regarding emergencies and supply disruptions. The Directive defines a major supply disruption as a loss of 20% of total European supplies from other or 'third' countries and danger of national measures not adequately managing the situation. It should last a minimum of eight weeks. This has been identified by the gas Coordination Group as inadequate as large parts of Eastern Europe could lose 100% of gas supplies for eight weeks without triggering a Community Response.

The Directive specifies security of supply obligations for Member States relating to the protection of supplies for domestic customers. These specific criteria are the minimum definition of 'security of supply standards'. These minimum standards ensure that supplies to the domestic sector are protected in the event of a loss of supplies or very high demand. They are defined as:

1) partial loss of national supplies for period to be determined by each member state;

2) extremely cold temperatures during a nationally determined peak period;

3) periods of exceptionally high gas demand during the coldest weather periods statistically occurring every 20 years (1-in-20 severe winter criterion).

Member states may extend the standard at their own discretion to include other non-domestic sectors or to apply more rigorous criteria.

The Directive outlines a number of instruments that may be used by member states in achieving these standards, including:

- Gas storage, including bilateral arrangements to use storage in another member state if there is sufficient interconnection
- Targets for industry to contribute to future storage
- Provision of pipeline capacity to enable diversion of supplies to affected areas
- System flexibility
- Development of interruptible demand
- Use of alternative back-up fuels in industrial and power generation plants
- Cooperation between TSOs in neighbouring member states for coordinated dispatching
- Diversification of sources of gas supply
- Domestic production
- Long-term contracts
- Investment in infrastructure for Liquefied Natural Gas (LNG) import via re-gasification terminals and pipelines.

3.2 Second Strategic Energy Review and Communication on Directive 2004/67/EC

The European Commission has recently published its Second Strategic Energy Review. In this review the Commission proposes the Council and Parliament adopt a five point "EU Energy Security and Solidarity Action Plan", the five points are:

- Infrastructure needs and the diversification of energy supplies
- External energy relations
- Oil and gas stocks and crises response mechanisms
- Energy efficiency
- Making the best use of the EU's indigenous resources.

The European Commission sees development of European energy infrastructure and diversification of supply as being of significant importance, particularly in relation to gas. They identify six priorities in this

regard; the development of a Baltic Interconnection Plan; the development of a southern gas corridor securing supplies from the Caspian and Middle East; an LNG Action Plan to provide access to LNG to all Member States; North-South gas and electricity interconnections; and a Blueprint for a North Sea offshore grid.

The implications for gas security of supply are positive as greater diversification of supplies, improved infrastructure, greater use of renewables and interconnection for the electricity sector would hopefully provide greater liquidity in supply while reducing the demand associated with power generation.

These themes in relation to gas security of supply are developed further in the European Commission's Communication[16] in relation to the implementation of Directive 2004/67/EC. This Communication discusses the merits of possible amendments to the existing directive including:

- extending the obligation to provide mandatory protection beyond households to power generators, SMEs and other vulnerable customers;
- more detailed or more harmonised security of supply standards;
- harmonising or basing on common criteria of the duration of a partial disruption and the duration of a winter peak demand period;
- the development of solidarity arrangements
- the introduction of a regional response step before community action be required
- definition of an effective EU Emergency plan
- measures to increase the security of supply margin

In relation to increasing the security of supply margin the European Commission states that this "excess gas" may come from a mix of sources; interruptible contacts, storage, or supply flexibility (production of LNG). In achieving this margin access to gas in other Member States, storage or otherwise, is noted as being important. However, it should be noted that the Communication explicitly rules out placing an obligation regarding strategic storage but does say that the development of commercial storage should be encouraged.

It is the aim of this communication to open a debate on the revision of Directive 2004/67/EC. Therefore it is important that the Regulatory Authorities, along with DCENR and DETI develop a clear understanding of the security of supply needs of the island so as to be better able to contribute to this European debate. Any revision of the Directive could have a significant impact on CAG in particular measures regarding the security of

[16] COM(2008) 769

supply standards, customers to be ensured supply and any requirements for storage or a "security of supply margin".

3.3 National legislation

3.3.1 Ireland

The obligations in the Directive are transposed into Irish law under S.I. 697 of 2007. This enhances the role of the Commission with regards to the security of supply of natural gas and places explicit responsibilities upon it to ensure all obligations of the Directive are implemented.

The security of supply responsibilities of the Commission are, in summary:

- Protecting the security of supply of natural gas
- Establishing policies to ensure adequate levels of security of supply
- Monitoring the security of supply
- Protecting the supply of natural gas to specific categories of customer
- Ensuring that security of supply measures and provisions do not place an unreasonable burden on energy undertakings and are compatible with a competitive internal gas market;
- Approving the Natural Gas Emergency Plan and appointing the National Emergency Manager.

SI 697 of 2007 requires the Commission to establish policies to ensure adequate security of supply and protection for domestic customers and small and medium enterprises in the event of:

- A partial disruption of national gas supplies during such period as may be specified from time to time by the Commission
- Extremely cold temperatures during a peak period (which period may be specified from time to time by the Commission)
- Periods of exceptionally high gas demand during the coldest weather periods statistically occurring every 20 years.

3.3.2 Northern Ireland

The principal objectives and general duties of the Department of Enterprise, Trade and Investment (DETI) and the Utility Regulator are outlined in the Energy (Northern Ireland) Order 2003. Under clause 5c of Article 14, DETI and the Utility Regulator are to secure a diverse, viable and environmentally long-term energy supply.

Also, further legislation is in place to deal with civil emergencies that may lead to a disruption in gas supplies. Under Article 40 of the Gas (Northern Ireland) Order 1996, DETI may direct licence holders to address any civil emergency that is or may be likely to disrupt gas supplies. Such directions are transposed into licence conditions and network codes which set obligations on licence holders for attaining security of supply standards. The licence conditions and network codes are set and monitored by the Utility Regulator. The specifics of the security of supply standards are discussed in Section 5.

Additionally Statutory Rule 1997 No. 195 Gas Safety (Management) Regulations (Northern Ireland) 1997 (GS(M)R), exercised through the Northern Ireland Health and Safety Executive (HSE(NI)) only allows licence holders to convey gas if a safety case has been submitted and accepted by HSE(NI).

A safety case requires demonstration that arrangements are in place to minimise the risk of a supply emergency and to also demonstrate that arrangements are in place should a supply emergency occur.

A further duty required within a safety case is compliance with the Northern Ireland Network Emergency Co-ordinator (NINEC). In accordance with the Regulations it is the NINEC Coordinator that has the sole responsibility for co-ordinating actions in response to a gas supply emergency.

4 Security of Supply: CAG harmonisation issues

If the single market is to operate on a fair and equitable basis for suppliers, shippers and transporters in Ireland and Northern Ireland, material differences between the two jurisdictions' markets should be harmonised where appropriate. In scoping the CAG project, security of supply was identified as one of the primary areas where harmonisation between Ireland and Northern Ireland is necessary and where significant benefits could be attained. There are several areas relevant to security of supply harmonisation under CAG:

i) Emergency procedures.

ii) Network security of supply standards.

iii) Shipper/supplier obligations with regard to security of supply

iv) Gas storage facilities - strategic and commercial.

v) Gas quality

vi) GB NTS Exit Reforms

vii) Planning and Development Framework

In this section, the differences between Ireland's and Northern Ireland's arrangements for security of supply are investigated in more detail and identifies where work is being addressed through other CAG work streams. In summary it is proposed that:

- Emergency procedures will be progressed through the operations work stream and a emergency working group comprising industry representatives will be established to further this work
- Gas quality be progressed through the gas quality work stream
- The regulators will jointly progress the NTS exit reforms
- Network security of supply standards, shipper/supplier obligations and the approach to gas storage will be progressed through the Security of Supply work stream, and as such are the subject of this consultation and are discussed in Section 5.
- The planning and development framework shall also be progressed through the Security of Supply work stream upon completion of the joint Gas Capacity Statement and outcome of this consultation.

4.1 Emergency procedures in the event of a supply disruption

The island of Ireland's heavy dependence upon gas imports from GB leaves it in a vulnerable position with regard to security of gas supply. In the event of partial or complete loss of supplies from GB (as a result of an incident at Moffat, a single IC disruption or disruption of supplies to GB itself), the lack of indigenous production, supply diversity and storage will cause disruption to the gas and electricity markets in both jurisdictions.

The EU Directive specifies that supply to domestic customers must be protected in the event of a 'partial disruption' to national supplies. SI 697 of 2007 extends the scope of the Directive in Ireland to ensure that supply to domestic customers *and* small to medium sized enterprises is protected in the event of a partial disruption to supply. In Northern Ireland licence conditions require that priority is given to maintaining the supply of gas to domestic consumers. Non-domestic priorities are assigned via an established "Priority List". In the event of an emergency in either jurisdiction; domestic customers will be given priority treatment, followed by commercial and industrial premises.

The actual definition of a 'partial disruption' to supply varies from country to country within the EU. Some member states (e.g. Slovenia, Bulgaria, Estonia) define disruptions as a percentage loss of supplies (minimum 20%) or a technical disruption for periods of time up to 8 weeks. The definition of disruption in other countries (France, Finland) is the loss of one supplier for up to six months and many countries have not yet defined what a 'partial disruption' to supplies is. In Ireland, triggers for an emergency include local or national transportation or supply deficits, gas quality emergency, the loss of 10,000 customers or the failure of a major gas participant. An emergency in Northern Ireland would be declared when supply to domestic consumers would be at risk or on a specific situation that the operator, in agreement with the NINEC, deems as an emergency. The security of supply situation in each country is unique as a result of their particular circumstances (size and composition of the market, number of suppliers, sources of supply, levels of interconnection, storage, contracts etc).

The Task Force on Emergency Procedures (TFEP) was established by the Commission in April 2005 to examine and report on the procedures to be followed in Ireland in the event of an emergency on the gas network, and the effect such an emergency would have on the electricity network, especially in light of the increasing interdependency between gas and electricity generation. The Commission is working on consolidating the requirements for generators to hold minimum stocks of alternative fuels. The TFEP has looked in detail at emergency procedures in GB; in the event of a curtailment of gas supply in GB, the GB emergency procedures provide for proportionate load-shedding between GB, Ireland, Northern Ireland, and the Isle of Man with supplies to Moffat being cut-off only when supplies to domestic customers in GB can not be maintained. A list of natural gas loads that will be the last to be shed in the event of a gas supply emergency has been compiled. This list

will be in addition to domestic customers who, for safety and social reasons, should be the last to be cut off. The TFEP has also examined the issue of communications in the event of a major supply disruption to both electricity and gas supplies. In all, 19 recommendations were made by the TFEP report and most of these have now been implemented. The focus of the group is now on the issue high level communication and potential scenarios which could result in the event of a national emergency (such as a flu pandemic).

In Ireland, S.I 697 of 2007 provides for the appointment of a National Gas Emergency Manager (NGEM) and for a Natural Gas Emergency Plan (NGEP) to be developed. The NGEP has been approved by the Commission and Gaslink has been appointed the NGEM. In Ireland, suppliers are obliged to comply with the instructions of the NGEM in the event of an emergency, including instructions to prioritise supply to domestic customers. The 'Emergency Procedures' section of the transporter's Safety Case provide details of the emergency response arrangements that gas undertakings have in place in order to provide an effective and coordinated response to gas local emergency situations such as gas leaks.

In Northern Ireland, emergencies are co-ordinated through the Northern Ireland Network Emergency Co-ordinator (NINEC), currently Phoenix Natural gas. Under their safety cases, NI transporters are obliged to comply with the instructions of the NINEC. The NINEC, together with transporters and shippers, are tasked:

- to avert and/or reduce the probability of or probable scale of an Emergency;
- to overcome or contain an Emergency and/or to avert or reduce the hazard presented by it;
- to restore Natural Gas supply and normal operation of the Transportation System

If an emergency is anticipated or declared, a Flow Order is issued from the Transmission System Operator (TSO) to the Shipper. The delivery of gas is then allocated according to the Priority Order, where power generation consumers are given the lowest priority and domestic consumers are given the highest priority.

The approach to emergency planning is to be examined under the CAG operations work-stream. It is intended that a working group be established shortly to make detailed recommendations in this regard. This work includes scoping and defining what a partial disruption on an all island basis entails. The key objective will be to formulate emergency plans and to ensure consistency with the GB emergency procedures. The group will consider all the issues relating to emergency arrangements on an all-island basis including:

- Emergency triggers
- Management of an emergency
- Co-ordination of the market participants
- Restoration to normal operations

It is considered that the Emergency Response Service (for gas leaks and other localised emergencies) should remain the responsibility of the individual Distribution System operator.

It is important that clear and transparent rules for compensation in an emergency be established to ensure full co-operation of the relevant energy undertakings in the event of an emergency and this also needs to be addressed as part of the CAG. Emergency procedures will need to be incorporated into the all-island Transportation Code(s) when agreed and this will be facilitated in the CAG work programme.

4.2 Gas Quality

Irelands Code of Operations specifies a general WI range for all gas entering the Irish system. This range is relatively wide but in practice most of the gas comes from the UK and there has been little variation in the range of Wobbe Index (WI) of the gases delivered to Ireland over the past 30 years. Northern Ireland's gas quality adheres to the Gas Safety (Management) Regulations (Northern Ireland) (GS(M)R(NI)) 1997 which prescribe a narrower WI range of 47.2 MJ/m^3 to 51.41MJ/m^3. In the event of an emergency in Northern Ireland, a wider WI range would apply (46.5 – 52.85 MJ/m^3).

There is considerable debate in Europe over the past few years regarding the appropriate WI. On the one hand a wider range permits more diverse sources of gas (particularly LNG) but concerns have been expressed over the safety of permitting such a wide range. EASEE-gas (European Association for the Streamlining of Energy Exchange) has recommended WI limits wider than GS(M)R limits but narrower than the Code of Operations limits (47 MJ/m^3 to 54 MJ/m^3).

In the near future gas supply to Ireland will consist of a combination of indigenous gas, imported natural gas and potentially LNG, each with potentially different gas quality specifications.

The Commission and Utility Regulator jointly published a consultation on Gas Quality (CER/08/101). This consultation examined the need for Ireland to narrow the WI specifications in line with the GS(M)R in light of our dependence on GB for imports, future indigenous production and Bord Gáis Network's report (CER/08/102) recommendations that the specifications should be narrowed on safety grounds.

In BGN's draft "Report on Gas Quality Arrangements in the Republic Ireland" it is recommended that:

- Consideration be given to changing the WI limits contained within the Code of Operations so that they are in alignment with the GS(M)R limits

- Non-Compliant Gas should be treated and processed so that it meets the specifications rather than implementing the widespread adjustment or replacement of appliances

- Gas treatment and processing should be carried out by the Delivery Facility Operator (DFO) before gas is delivered into the transmission system

The Commission and Utility Regulator organised an industry information workshop in August 2008. An industry workgroup has been established under the CAG to look at the issues involved and has issued a report in November 2008 on the proposed gas quality standard. A decision is expected in December 2008.

4.3 U.K. National Transmission System (NTS) Exit Reform

Currently, gas entering the Irish system via Moffat is obtained using a 'ticket to ride' system, whereby an Irish shipper nominates a GB registered shipper to transport and exit gas at the Moffat GB exit point, from which point the Irish shipper takes title and enters the gas onto the Irish system at the Moffat entry point. Only GB shippers who have counter-party on the downstream capacity register may acquire NTS exit capacity at the Moffat exit point. This is referred to as a 'certification process' and is designed to prevent a party from hoarding exit capacity at Moffat at the expense of the downstream jurisdictions.

Northern Ireland uses the same 'ticket to ride' system with PTL acting as a shipper for all gas entering the Northern Irish system at Moffat.

Ofgem the GB regulator, is currently considering reforms of the current exit arrangements on the GB transmission system. It is proposing a new "enduring offtake" framework for all exit points on the system. The aim is to create a "user commitment" model with an emphasis on all shippers who offtake at an NTS exit point to secure sufficient capacity to meet their needs 3-7 years in advance. The reforms propose to terminate the "certification process" and therefore the 'ticket-to-ride' system used by downstream parties.

These proposed reforms have the potential to negatively affect the security of gas supplies and the development of the gas and electricity markets in the downstream jurisdictions.

The Commission and Utility Regulator have jointly been in regular contact with both Ofgem and National Grid (NG) NTS, the GB Transmission System Operator, since the announcement of these proposed exit reforms to discuss their potential impact on transactions at Moffat and how the subsequent risks to the downstream jurisdictions can be minimised. Ofgem is scheduled to make a final decision with regards to the reforms later in 2008. The Commission and the Utility Regulator are jointly reviewing the situation and are consulting with industry regarding measures to ensure appropriate measures security of supply and market foreclosure on an all-island basis.

4.4 Planning and Development Framework

The Commission publishes the Gas Capacity Statement each year, this Statement forecasts demand and supply for the next seven years and assesses the adequacy of the network, highlighting any potential reinforcement that may be required. In Northern Ireland the Pressure Report is prepared by BGÉ and PTL and approved by the Utility Regulator.

The Gas Capacity Statement 2008 confirms that the existing transmission system has sufficient capacity to meet demand over the seven-year period.

The December 2007 Northern Ireland Pressure report finds that the pressure service available in Northern Ireland is sufficient to meet demand if Corrib comes online on time. However if the delivery of gas from the Corrib field is delayed, conditions are tight under peak demand. Under such conditions, operational measures can be taken to ensure that pressures are maintained at adequate levels.

A Joint Gas Capacity Statement will be produced for the island in July 2009. This is a separate work stream under CAG.

Following on from this and having regard to the output of the security of supply standards workstream a planning and development framework will be developed as part of the CAG Security of Supply work-stream. A consultation on the framework is planned for November 2008.

5 Consultation on Security of Supply Issues

5.1 Network Security of Supply Standards

The Gas (Interim) (Regulation) Act 2002, as amended by SI 697 of 2007, licence obligations and the Code of Operations provide the basis for the security of supply standards currently in place in Ireland.

In NI, licence conditions require adherence to network codes that set out the detailed requirements for network operation including provisions for capacity shortfalls and emergency planning in the event of restrictions to the supply of gas.

Directive 2004/67/EC outlines a minimum 1 in 20 severe winter criteria and the definition of the peak day period is left to Member States. Gaslink designs the transmission system to meet 1-in-50[17] peak day demand, but there is no specific obligation on the Transmission System Operator (TSO) to design the transmission system to meet severe winter criterion as in GB. In GB, however, there exists a more complex gas network with more diverse sources of supply which must be accommodated by the transmission system infrastructure for various different scenarios. The three transmission operators for Northern Ireland: Premier Transmission (PTL), BGE(NI) and Belfast Gas Transmission Limited (BGTL) are obliged in their respective transportation codes to provide arrangements for capacity shortfalls[18] and emergencies. Severe winter criteria differ between Member States in the EU and are dependent upon the climatic situation in that country, amongst other factors.

The periods for which the networks' peak day and severe winter criteria are designed must also be defined. The island of Ireland's line-pack (combined BGE and PTL line-pack of 15.3mcm[19]) would be exhausted by domestic demand within 2 days of a peak day disruption at Moffat (assuming generation switches to alternative fuel), leaving only Kinsale production and

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[17] 1-in-50 peak day refers to the ability of the transmission network to be able to transport gas supplies which would at least equal the daily firm demand for a peak period which, having regard to historical weather and other data demand from at least the previous 50 years, is likely to be exceeded (whether on one or more days) only in 1 year out of 50 years

[18] A system shortfall occurs when the aggregated nominated quantity exceeds the available capacity

[19] CSA Group *Study on Common Approach to Natural gas Storage and Liquefied Natural Gas on an All-Island Basis* Executive Summary, November 2007, pg 9.

storage for supply[20]. Given such constraints, the peak day period should be at least 2 days, probably more giving consideration to historic peak day data and how long the cold periods tend to last. Through its licensing regime, the Commission has imposed an obligation on gas-fired generation to have the ability to run on an alternative fuel for five days. Bearing this in mind, 5 days may be a suitable peak day period.

Different arrangements exist in Northern Ireland for back-up fuel supplies. In order for DETI to grant a licence to construct, extend or operate a power station, generators must ensure adequate back-up fuel supplies. This is a requirement under Article 39 of the Electricity (Northern Ireland) Order.

Ballylumford power station are required to hold a few weeks stock of backup fuel as they were part of the original privatisation power procurement agreements. Whereas new merchant plants entering the market, such as Coolkeeragh, must hold 5 days continuous supply of back-up fuel.

Generators must also have contracts in place to resupply back-up fuel stocks.

Under section 9 of the Electricity Regulation Act 1999[21] the Commission is required to regulate the activities of natural gas undertakings with respect to safety. In carrying out this function the Commission must establish a Natural Gas Safety Regulatory Framework. The Commission published this Framework in October 2007 (CER/07/172). A key part of the Framework is the requirement upon all gas undertakings to submit a Safety Case to the Commission for its assessment and acceptance. The emphasis of the Safety Case regime is on 'demonstration' by the gas undertaking that acceptable safety arrangements for the management of gas-safety related risks are in place and working effectively on a day-to-day basis.

In NI, under the GS(M)R information to be provided in a safety case must include particulars to demonstrate that the duty holder has established adequate arrangements to minimise the risk of supply emergency and present established arrangements for dealing with supply emergencies should they occur.

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[20] Bord Gáis Networks (2007) *Transmission Development Statement* for 2006/07 to 2012/2013, pg 37.

[21] As amended by the Energy (Miscellaneous Provisions) Act 2006

Questions for Respondents

1. Should an obligation be placed on network operators to build and maintain the network to a 1-in-20 or a 1-in-50 peak-day?

2. Is a period of five days appropriate for the period for which supplies to domestic customers must be protected in the event of a partial disruption to national supplies?

3. Does a peak-period (as specified in 19A (1)(c)(ii) of the 2002 Act) need to be specified? Or does a 1-in-50/1-in20 peak-day imply a sufficient period for this purpose?

4. Are there additional minimum standards required for other energy undertakings or offshore producers?

5.2 Obligations on shippers and suppliers

In Ireland, the current Network Code requires shippers to the Non-Daily Metered (NDM) sector to reserve capacity to meet their 1-in-50 peak day demand (known as secondary capacity). In the likelihood that secondary capacity will not be used it can be sold on for use elsewhere. In the event that it is needed, however, the capacity can be recalled and used to fulfil peak day or severe winter criteria and meet demand to the NDM sector.

In Northern Ireland, distribution licenses contain an obligation to book capacity to meet 1-in-20[22] peak day demand. Supply licenses have an obligation to secure supplies to meet a 1-in-20 peak day demand and 1-in-50[23] severe annual demand.

In Ireland, there are no specific shipper and supplier *licence* obligations to meet domestic supply during peak or severe winter periods. Such obligations could include alignment with the all-island network security of supply standards, requirements to book capacity to meet the standards and

[22] 1-in-20 peak day criteria refers to the availability of a supply of gas for a defined peak period which would at least equal the daily firm demand which, having regard to historical weather and other data demand from at least the previous 50 years, is likely to be exceeded (whether on one or more days) only in 1 year out of 20 years

[23] 1-in-50 severe winter criteria refers to the availability of supplies of gas over a year which would equal the aggregate amount of daily firm demand over a year which, having regard to historical weather and other data demand from at least the previous 50 years, is likely to be exceeded only in 1 year out of 50 years.

contracts to ensure supply for domestic customers in the event of a severe winter or peak period.

In both jurisdictions, there are no obligations on shippers and suppliers to hold a certain level of supplies in storage. For example, in Spain shippers must maintain security stocks equivalent to at least 35 days of sales or final consumption[24]. If something equivalent was adopted for the island of Ireland, it is likely that the requirement to hold gas in the existing Kinsale (SWK) storage facility would be insufficient for this purpose due to its limited daily deliverability and present operation as commercial storage. There are opportunities to purchase storage in GB through bi-lateral agreements. In the event of the loss of the Moffat entry point, however, this would prevent access to this storage.

The Commission has placed broad but non-specific obligations on shippers to take security of supply into account when contracting supplies, i.e. suppliers must consider the future source of supply, diversity of supply and reliability of supply when purchasing gas.

Given Ireland and Northern Ireland's high dependence on interconnection with GB for supply and lack of significant indigenous production or storage, it isn't practical for shippers and suppliers to source their gas from alternative countries or alternative supply points. GBs National Balancing Point (NBP) is well diversified but from an Irish supplier's point of view, there is no way of determining the source of the gas they receive. From an all-island security of supply point of view it makes no difference if they could; in the event of a disruption all gas is received through a single entry point. When Corrib and SLNG come online as well as possible storage developments at Larne and in the Celtic sea, this will provide scope for requiring shippers to diversify their supply portfolios.

It is necessary to ensure consistent obligations on Irish and Northern Irish shippers/suppliers in relation to security of supply. It would make sense to include such obligations in their licences. These issues will be consulted on in the CAG consultation on security standards.

Questions for Respondents

1. Should shippers/suppliers be required to book peak-day/severe winter capacity for a 1-in-50 annual demand or a 1-in-20 for peak-

[24] A. Perez *et al* "A Southern perspective on diversifying natural gas supply. The case of Spain" [online], available: http://www.uaces.org/EE_Vaquer-Perez.pdf [accessed 25/08/08]

day? What costs would be incurred by shippers/suppliers in order to meet such proposed requirements?

2. Should shippers/suppliers be required to secure supplies for a 1-in-50 annual demand or a 1-in-20 for peak-day? What costs would be incurred by shippers/suppliers in order to meet such proposed requirements?

3. Should obligations be placed on shippers/suppliers ensuring minimum levels of diversity in their contracted sources of supply?

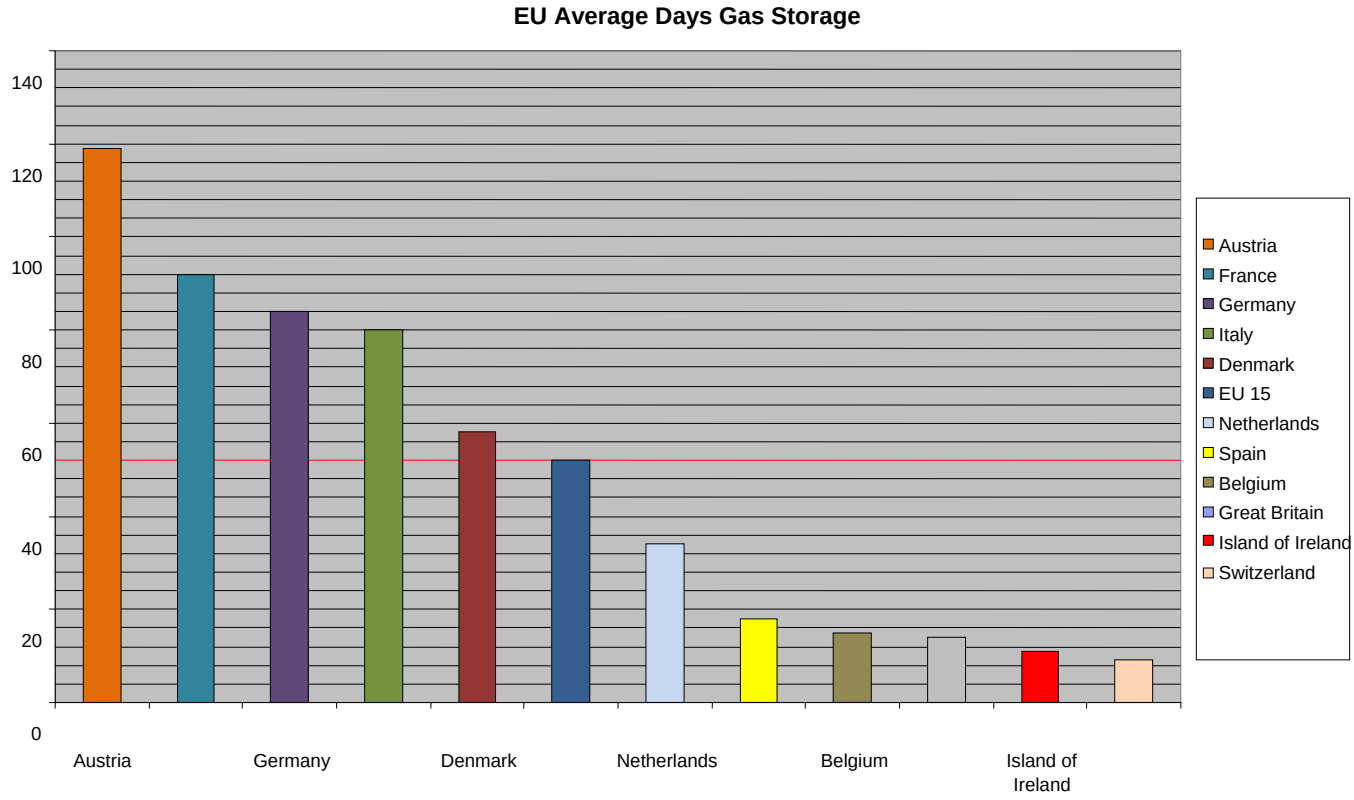
4. Should obligations be placed on shippers/suppliers relating to long-term contracts?

5. Are shipper/supplier obligations best provided for through licence conditions or through the Code(s) of Operations?

5.3 Gas storage

EU member states have an obligation under EU Directive 2006/67/EC to hold oil stocks equivalent to 90 days of average daily consumption of the previous year. However the storage of gas is approximately 10 times more expensive per energy unit than oil, and requires additional substantial investment in transport infrastructure in case of a disruption. The gas storage situation is extremely diverse among EU member states. This is due to the specific situation of each gas market. At one end of the scale Austria has a large amount of storage capacity, to offset its reliance on Russian imports (nearly 120% of total imports as of 2007). At the other end Great Britain has a low amount of storage capacity, due its historical position as a natural gas exporter. However, the UK is investing heavily in storage infrastructure before 2010 and its storage capacity will increase, as it tries to maintain its security of supply. It is moving from being a net exporter of gas to being a net importer as the North Sea fields are depleted. It should be noted that most European countries with little indigenous gas reserves have considerable gas storage facilities. As of end 2005, the average number of days of gas storage on the island of Ireland was 11 days[25], whereas the average EU-15 was 52 days. If we expect to receive equal treatment in GB (with respect to access to storage) in the event of an emergency, peak day or severe winter event, it may be important to maintain relatively equivalent indigenous storage.

[25] CSA Group (2007) *Study on Common Approach to Natural gas Storage and Liquefied Natural Gas on an All-Island Basis* Report, published November 2007.



Graph 1: EU Average Days Gas Storage % [26]

The only gas storage capability currently in Ireland is South West Kinsale (SWK) storage, which is a converted depleted gas field. If supplies were disrupted during normal winter weather at Moffat and all required load shedding, fuel switching and emergency procedures adhered to, after 2-7 days all linepack would be used[27] and only Kinsale production and the South West Kinsale (SWK) storage facility would be available. The SWK storage facility has a working volume of 200mcm but a maximum deliverability of only 2.5mcm/d. Combined with current Kinsale production of approximately 1mcm/d this would give a daily deliverability of 3.5mcm/d. SWK storage can only deliver 2.5mcm/d for a few days before deliverability drops off. 1-in-50 peak day domestic demand (for the whole island of Ireland) is over 7mcm/d

[26] CSA Group *Study on Common Approach to Natural gas Storage and Liquefied Natural Gas on an All-Island Basis*, November 2007.

[27] Bord Gáis Networks (2007) *Transmission Development Statement* for 2006/07 to 2012/2013, pg 37.

so significant interruption would likely be necessary to the domestic sector[28] should supplies be disrupted during a very cold spell.

It should be noted that SWK storage is operated on a commercial basis by Marathon and is not a strategic storage resource. The facility utilises offshore production from the gas field during the summer months and also imported gas from Great Britain. There has been some discussion on potential improvements for the storage facility, including increasing the sites withdrawal rate and expanding the storage facility by 30-40%. Marathon, as the current offshore production and storage operator, is obliged under licence conditions to cooperate with the National Gas Emergency Manager (NGEM) in the event of an emergency. The Commission has put in place interim arrangements to ensure that Marathon will receive compensation for any gas diverted from its production and storage operations during an emergency but these need to be formalised in the Code of Operations. The site is currently for sale and future developments for the site may change.

The proposed storage facility in salt deposits at Larne in Northern Ireland for 2014/15 would help alleviate the current lack of gas storage. Estimated capacity for the proposed storage facility at Larne is 500 mcm. The potential gas storage facility at Larne may allow the opportunity to park indigenous and imported gas for release should any supply disruption occur either from upstream infrastructure failures or restrictions on long distance imports.

It is proposed that storage will be developed at Shannon LNG at Tarbert on the Shannon. This project is expected to be commercially operational by 2012/13 and expected to provide capacity of 17 million standard cubic meters per day with a potential of 28 million standard cubic meters per day.

The addition of an LNG terminal to Ireland's natural gas infrastructure would significantly enhance Ireland's security of supply with respect to gas. Although LNG storage is expensive, its high send out capacity would be ideal in the event of emergency, peak day or severe winter event.

Other potential options include the development of depleted Celtic sea fields (such as Ballycotton) as storage.

The Departments of the Republic of Ireland (DCENR) and of Northern Ireland (DETI) commissioned a report entitled a "*Common Approach to Natural Gas Storage and Liquefied Gas on an All-Island Basis*", the executive summary of

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[28] CSA Group (2007) *Study on Common Approach to Natural gas Storage and Liquefied Natural Gas on an All-Island Basis* Executive Summary, published April 2008.

which was published in April 2008. The analysis for this report considered the potential demand and supply scenarios from the present until 2020. It outlined a number of short, medium and long term storage options, some of which are outlined in Table 5. A working group comprising the two departments and the regulators is taking forward these recommendations. It is intended that some of this work may be supported through the CAG security of supply work-stream. Specifically it is intended to address the issue of commercial and strategic storage through the CAG consultation on security standards.

Table 5: Recommendations from the All Island Natural Gas Storage and LNG Study

Short Term	Ensure CCGTs maintain 5 days distillate storage
	Raise operational pressure on transmission system to increase line-pack
	Increase off-take pressure from GB's National Grid exit point in Scotland
Medium Term	Increase storage and deliverability at SouthWest Kinsale
	Develop recent Irish Sea discoveries as storage facilities
	Construct peak shaving LNG facility on the island of Ireland
	Develop rapid response LNG import facility
	Flatten Corrib production profile
	Consider construction of a by-pass around Ballough AGI
Long Term	Strategic gas storage in salt caverns
	Strategic gas storage in LNG tanks
	Strategic gas storage in depleted gas fields

Questions for Respondents

1. Should storage operators be required to hold minimum levels of storage?

2. Should shippers/suppliers be required to hold minimum levels of storage?

3. Should storage stocks in GB storage facilities be considered an appropriate security of supply measure?

4. Would obligations in relation to storage distort the Irish gas market?

5. Are there sufficient incentives in place for the commercial provision of adequate storage?