Shannon LNG

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Re: Common Arrangements for Gas Security of Supply, Consultation Paper, 19thDecember 2008

Dear Robert,

We are writing in response to the above paper report that was issued for public consultation on the 19th of December 2008.

Shannon LNG welcomes the Regulatory Authorities' comprehensive review of this subject and we believe it is timely.

We provide below some comments on the consultation before addressing the detailed questions raised in the paper.

General Comments

Distinction between reliability of supply in contracts and emergency situation
In considering security of gas supply for the island, we believe it is important to distinguish between:

  (i) security (reliability) of gas supply under commercial contracts; and

  (ii) security of supply under the occurrence of an unforeseen low-probability / emergency situation.

For larger consumers of gas on the island, the commercial reliability of the supply should be included in the contract agreed between the parties. Most large consumers are sophisticated enough to understand the trade-offs they may make, such as between lower prices in return for lower reliability of supply (as in the case of an interruptible gas supply contract for example).

For the residential and commercial sectors (NDM) where contracts tend to be of standard form and where the effect of a gas supply interruption may have greater consequences, we agree it is necessary for the Regulatory Authorities to ensure suppliers can provide secure and reliable gas supplies to these end-customers. As long as the market is functioning, suppliers should be able to provide this assurance by

demonstrating they have access to the open market and the wherewithal to buy the gas on that market.

Point (ii) above can be considered as the capability of the country to manage, for a given period of time, external influences which lead to a disruption in gas supplies, which cannot be readily balanced by the market itself. This is the type of event where we think the Government/Regulatory Authorities should be expected to play an important role.

The Regulatory Authorities should insure against low probability but high impact events to which market mechanisms cannot meaningfully respond, by the provision of strategic storage.

While open and competitive markets provide consumers with choice and lower prices, they will not value investment in insurance assets to ensure secure supplies to the end-consumer under low-probability events occurring (extreme weather conditions or a large disruption of supplies).

Remit of the Joint Steering Group Sub-Committee?
Page 5 of the consultation paper states that a Joint Steering Group sub-committee on security of supply will be working in tandem with the Common Arrangements for Gas (CAG) project on security of supply. We think it would be helpful for the Regulatory Authorities to publish the remit of the Joint Steering Group sub-committee on security of supply so that we can understand the policy areas which they are responsible for and the policy areas which the CAG project is responsible for.

Load duration curve would assist the debate
In relation to the CAG project on security of supply, we believe it would be helpful if there was additional quantitative information provided to support the debate. For instance, we think a load duration curve for gas demand on the Island showing the residential, commercial, industrial and power generation sectors would help inform the debate and possibly lead to better decisions.

Flexible gas supplies needed to back-up variable wind generation
We agree with the view expressed on page 12 of the paper that gas fired generation will be required to back up wind generation. This back-up generation will require a highly flexible and fast response gas supply. An LNG terminal is particularly well suited to provide this type of flexible gas supply to the market.

Long lead times - Ireland must start planning security of supply projects now
We believe the Regulatory Authorities are correct to start addressing security of gas supply in Ireland now. According to the National Grid Ten Year Statement 2008, the UK will be importing 72% of its gas requirements by 2017/18. The type of infrastructure projects needed in Ireland to improve security of supply have long lead times associated with their planning and development. As some European countries unfortunately found to their detriment recently, without adequate storage within the country, which can be provided by natural gas stored underground or as LNG, there is very little that can be done in the short term to provide a gas supply once a third party country has interrupted pipeline gas deliveries.

Gas pipelines do not guarantee gas availability
We think it is important that the Regulatory Authorities draw a clear distinction between pipeline system capacity and actual gas availability. The more critical issue in today's world is ensuring the gas molecules are available to the consumers – while building pipeline capacity is a relatively straight forward exercise, establishing the security of

supply and supply contracts behind those pipelines is a far more challenging undertaking.

The geographical proximity of LNG storage or underground natural gas supply is another important consideration for security of supply, i.e. storage facilities in the UK do not guarantee gas availability in Ireland to the same extent as storage located within the Island.

Phase 1 of the Shannon LNG has the potential to provide 50% of the Island's peak day demand
Page 14 of the paper states that the Shannon LNG terminal will only be able to provide 17% of the island's peak day gas demand in 2012/13. There is an obvious misunderstanding here: there is a difference between the export capacity of the Shannon LNG terminal and a sales forecast we provided under the Gas Capacity Statement process. One of the elements that differentiates LNG supply from pipeline supply is the ability to increase sendout rapidly, at relatively little incremental cost, to meet peak demands using the storage capacity of the terminal's tanks.

For example, in phase one of the project, Shannon LNG is initially planning to install 11.3 million cubic metres (mcm) per day of baseload vaporisation process capacity with 17.0 mcm per day peak vaporisation process capacity. The 50% increment of capacity[1] can provide short duration gas delivery services to meet peak demand requirements within the limits imposed by the LNG inventory at or en route to the terminal. If built, the Shannon LNG terminal could have the ability to export 17 mcm per day, which would equate to about 50% of Ireland's peak day demand in 2012/13 (not the 17% referenced in the document). The interconnecting pipeline from the terminal has a planned capacity of 28.3 mcm per day and would not be a limit to peak sendout.

Shannon LNG has planning permission for up to 450 mcm of natural gas storage
The inference in the final paragraph on page 14 is incorrect - Shannon LNG has planning permission for an LNG terminal that can ultimately export up to 28.3 mcm per day from a storage capacity that could be equivalent to 456 mcm[2] of gas and is therefore capable of supplying a significant component of the all-island demand on the peak day.

The Shannon LNG terminal can provide both commercial and strategic storage
While the Shannon LNG project is being developed as a gas supply project to serve the Irish market, it will also be able to offer both commercial and strategic storage services. Shannon LNG has planning permission to build up to four 200,000m[3] LNG storage tanks.

We summarise in the tables below the physical characteristics of the Shannon LNG Terminal.

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[1] The difference between 11.3 mcm and 17.0 mcm is 50%.
[2] 800,000 m^3 of liquid storage with an effective drawdown of 95%, multiplied by an expansion factor of 600

Table 1 - Physical Export Characteristics of <u>Permitted</u> Shannon LNG Terminal	
Phase 1 maximum export capacity (million cubic metres per day)	**Phase 2 maximum export capacity (million cubic metres per day)**
17.0	28.3

Table 2 - Physical Storage Characteristics of <u>Permitted</u> Shannon LNG Terminal					
Number of Tanks (Planning permission granted for 4 tanks)	**LNG Storage Capacity (effective)** (m^3 of LNG)	**Equivalent Natural Gas Storage Capacity (effective)** (million cubic metres of natural gas)	**Number of days storage for Island based on average daily demand** (18.3 million cubic metres per day) [3]	**Number of days storage for Island based on peak daily demand** (25.2 million cubic metres per day) [3]	**Number of days storage for average residential and commercial (NDM) demand on Island** (3.9 million cubic metres per day)[3]
1 storage tank	190,000	114	6.2 days	4.5 days	29.2 days
2 storage tanks	380,000	228	12.5 days	9.0 days	58.5 days
3 storage tanks	570,000	342	18.7 days	13.6 days	87.7 days
4 storage tanks	760,000	456	24.9 days	18.1 days	116.9 days

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[3] Calculated using daily demand data on Gaslink website on all-island basis for 2007/08 Gas Year

Importance of diversity of natural gas supplies
We agree with the European Commission's point cited at the bottom of page 15 of the consultation paper that diversification of gas supply is of significant importance. Diversification includes the origin of the gas supply and different entry points to the pipeline system. The Shannon LNG terminal will provide unmatched diversity of supply as it will provide the potential for natural gas to be imported to Ireland from a range of countries around the world.

Gas quality
With respect to gas quality and security of natural gas supply, we would refer the Regulatory Authorities to the submission Shannon LNG made on this subject as part of the CAG project on the 12th of January 2009, but reduced to its simplest conclusion, the more stringent the gas quality limits imposed by the regulators or the system operator, the less flexibility will be available in LNG supply.

LNG can provide the most competitive form of storage on the Island
We do not understand the basis behind the statement on page 32 of the paper that "Although LNG storage is expensive,.....", Could you please provide the data that was used to arrive at this conclusion?

We believe that LNG storage can be the most competitive form of natural gas storage on the Island and is best suited from all the alternative mooted to provide the storage requirements of the Island.

This is especially true when it comes to meeting extreme peaks in demand over very short durations. Many countries and regions around the world have installed LNG "peak shaving" plants which have very limited storage but very high sendout rates as the most economical and flexible means of meeting peak day requirements. While these facilities might appear to carry high unit prices, they are a much less expensive supply source than a very underutilized pipeline or conventional underground storage field when load factor effects of utilization rates are taken into account.

LNG as a form of storage
There are also misunderstandings as to the physical characteristics of LNG storage. LNG storage relies on a phenomenon known as "auto-refrigeration" which is a condition where the LNG is maintained as a liquid by the heat transfer involved when the liquid evaporates. This evaporating gas is called "boil-off" and is captured at the terminal and injected into the pipeline grid. However, the rate of evaporation is very low, on the order of 0.04% of the storage tank capacity each day. At this rate it would take over six years for the contents of a full LNG storage tank to completely evaporate. In addition, if necessary, facilities could be installed to convert the "boil off" back to LNG.

### **Response to the questions in the consultation paper**

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?

We agree a common design standard should be used across the island – it is not clear to us why a common standard does not already exist across the Island.

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?

We prepared a load duration curve for residential and commercial (NDM) customers in the Republic of Ireland for 2007/08 (Figure 1) based on data available on the Gaslink website. Figure 1 below shows that there is a factor of about 6 between residential and commercial gas demand on a cold winter's day and on a summer's day. We believe the number of days customers should be protected from a low probability supply interruption should be considered in the context of a disruption occurring during a period of extended cold.

Figure 1 – Republic of Ireland Load Duration curve for Residential and Commercial (NDM) Customers, 2007/08 Gas Year
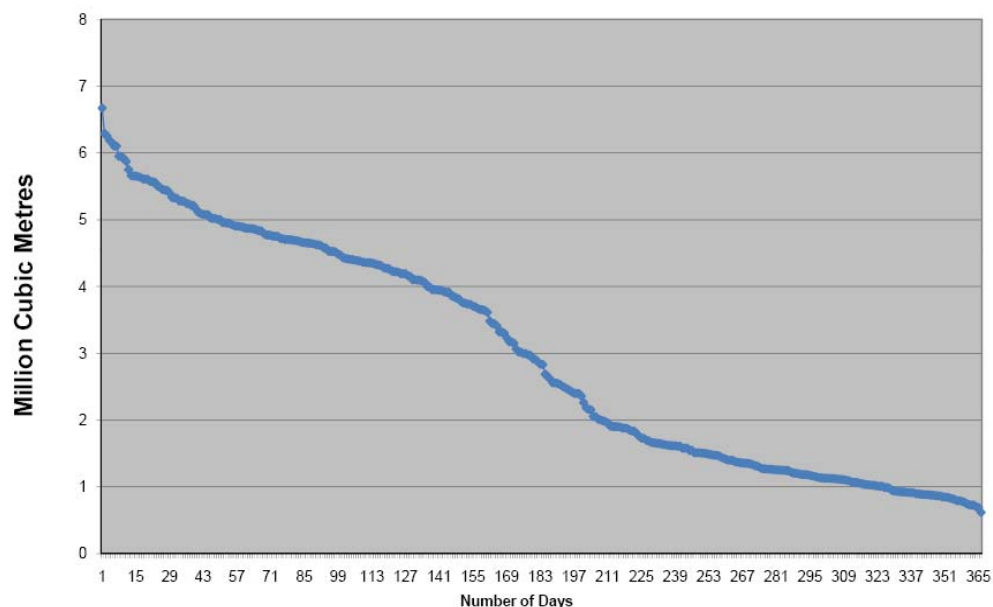
The recent dispute between Russia and Ukraine lasted well over two weeks and domestic consumers in some of the countries affected by the dispute had their supplies interrupted for over two weeks during an extended cold spell.

In an era when the UK had adequate indigenous supplies and was a net exporter of natural gas, five days appeared an adequate period of time to plan for the protection of supplies to domestic customers. In eight years time however, the UK will be importing 72% of its gas[4]. Looking ahead eight years, it appears the market, technical and political risks affecting Ireland's gas supply will be much different than they are today. It would appear sensible for Ireland to put in place strategic storage requirements similar to some central European countries as shown in Graph 1 in the consultation paper (see response to question 11 for further details).

To better address this issue, we think it is important to define "a partial disruption to national supplies" in a more practical way and consider how to best protect not only NDM customers but also DM and LDM customers, where necessary, including demand side response measurements. For this, we think it is also worth the Regulatory

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[4] National Grid Ten Year Statement 2008

Authorities considering the economic effect of such a partial disruption to national supplies.

3.a   Does a peak-period (as specified in 19A (1)(c)(ii) of the 2002 Act) need to be specified?

The period as specified in 19A (1)(c)(ii) of the 2002 Act appears to relate to the supply of natural gas.

3.b   Or does a 1-in-50/1-in-20 peak-day imply a sufficient period for this purpose?

The 1-in-50/1-in-20 peak-day standard appears to apply to the design of transmission pipelines.

We believe it is important that the conclusion the Regulatory Authorities arrive at in this area considers the total gas supply system, i.e. the pipeline delivery system and the available natural gas supplies.

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

Offshore producers and energy undertakings in Ireland already work to recognised standards in operating their businesses.

The state owned energy sector in Ireland works to a guaranteed cost recovery model. Private sector energy companies do not have guaranteed cost recovery. Any minimum standards of delivery for private sector energy companies should be contained in commercial contracts with customers.

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?

No. We think the Regulatory Authorities should consider the financial burden any such obligation will place on suppliers in the market and the consequence this will have on the gas price to consumers. As stated previously, large consumers of gas on the island should address the commercial reliability of their gas supply in their supply contracts.

For the residential and commercial sectors (NDM) where contracts tend to be of standard form and where the effect of a gas supply interruption may have greater consequences, we agree it is necessary for the Regulatory Authorities to ensure suppliers can provide secure and reliable gas supplies to these end-customers. As long as the market for natural gas is functioning, suppliers should be able to provide this assurance by demonstrating they have access to the open market and the wherewithal to buy the gas on that market.

Forcing shippers/suppliers to commit in advance to securing a seasonal gas supply equivalent to 1-in-50 annual demand however may not be commercially viable and could result in extremely expensive gas sales prices when those costs are averaged into the system transportation costs. Capacity reserved for a 1-in-50 peak day will have a daily utilisation rate of less than 1/100 of 1%[5].

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[5] 1-in-50 equate to 2% annual utilisation rate, further divided by 365 to calculate the daily utilisation rate of less than 0.01%.

We think the market should be allowed to respond to meet high demand for gas on very cold days and security of supply should normally be met through market mechanisms.

Only during a market failure should supplies be allowed to be drawn from the proposed national strategic storage reserve.

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?

See answer to question 5.

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

No. It is contrary to good commercial practice and we believe it is anti-competitive. It would also appear impossible to measure – what would constitute a measurement of a "minimum level of diversity"?

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

No. Shippers/suppliers should be allowed to enter into contracts, be they either long term or short term in nature, that best suit their commercial requirements.

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

As this is an implementation type issue, we believe it is premature to address it at this stage.

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

No. The minimum gas volumes held by storage operators should be contained in commercial contracts with their customers.

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

No, but the state should consider a strategic storage reserve of LNG or natural gas, similar to the oil storage model (National Oil Reserves Agency), paid for by the consumers of natural gas in Ireland.

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

No. This measure would not provide the security of supply the country needs.

Holding storage stocks in GB storage facilities will not mitigate against the key risk facing Ireland's gas supplies – interruption of gas intended for delivery to Ireland from and through the UK.

In addition, in the event of an emergency in the UK, we understand National Grid will limit gas supplies to Ireland in accordance with an agreed order (i.e. power station

supplies are curtailed first etc), regardless of whether Irish shippers hold gas in GB storage. Therefore, even if Irish shippers hold gas in UK storage, if an emergency is declared in the UK, Irish shippers may not be able to access that stored gas.

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

There is already a strategic storage reserve of oil in Ireland, which, to our knowledge, does not distort the oil market. Hence, a similar natural gas storage reserve is unlikely to distort the gas market, if properly managed by the State.

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

The market currently provides signals for the provision of commercial storage (for seasonal supply) and we suggest that the Regulatory Authorities should not interfere with this. The market should be let function to allocate resources, capacity and investment most efficiently.

With regard to insurance against low probability events, these may not necessarily be valued by the market and therefore the Regulatory Authorities should introduce a strategic gas storage stock.

Thank you for providing us with the opportunity to provide input to this consultation and we hope you will consider including the above points in the final decision.

Yours sincerely,

Martin Regan
Commercial Manager