

Interconnector Tariffs and Competition in the Irish Gas Market

Report for Shannon LNG.

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Summary

Ireland has come to rely on natural gas for an increasing share of its energy needs since the Kinsale Head field went into production in the late 1970s. Electricity generation is heavily reliant on gas, there is an extensive distribution system reaching most large urban areas for residential customers and there is also significant commercial and industrial demand. However the Kinsale Head field is nearing the end of its life and Irish gas demand is now met almost entirely from imports through twin interconnectors from Scotland in the ownership of the state company BGE. The first interconnector was commissioned in 1993 and the discovery of a substantial new source, the Corrib field in 1996 was expected to supplement the declining Kinsale Head production and obviate the need for further import capacity. However delays to Corrib production, originally planned for 2001, and projections of increasing gas demand persuaded the authorities to approve a second interconnector from Scotland which was commissioned in 2002. Delays to the Corrib project have continued but most works offshore and onshore have finally been completed and production is now expected to commence during the year 2013.

There are also active plans to construct an importation facility for Liquefied Natural Gas in north Kerry. In recent years the supply of LNG from the Arabian Gulf and elsewhere has been expanding. Meanwhile technological developments have permitted sharp increases in North American gas production and this region has already become a less significant importer, and may shortly become an exporter, of LNG. As a result of these developments there has been rising optimism in recent years about the availability and cost of natural gas supplies into the European market.

In an open trading economy which will inevitably import a substantial portion of raw materials, including energy, it is essential to ensure that these input costs are minimized. The current review by the Commission for Energy Regulation of the likely economic consequences of alternative tariff regimes in the gas industry needs to be informed above all by considerations of overall economic competitiveness. The starting point is a level of gas and electricity prices which inhibits the competitive position of the traded sector. Tariff policy alterations which inhibit either entry from competing importers or future exploration effort should be avoided. Irish energy costs can be thought of as world prices plus the costs of importation, transmission, conversion and distribution, and need to be contained in order to avoid further loss of competitiveness.

Cost containment requires vigilance most of all in the approval processes of the regulator regarding expansion in the asset base of the regulated natural monopolies and in the returns which they are allowed on their historical assets-in-place.

Production from the Corrib field or from any other domestic supply sources which might be discovered will enhance physical supply security for the period of depletion. In the case of Corrib this could be as short as ten or twelve years, after which supply reliance would return to the interconnectors. The apparent preference of the CER for the full remuneration of BGE interconnector assets, despite the absence of any formal

underwriting of IC2 by either customers or government, is not consistent with a cost-reducing remit for energy policy. It would amount to a cross-subsidy from domestic producers and alternative importers to the users of the interconnectors, and appears to be in conflict with EU policy.

An LNG terminal makes a durable contribution to supply security since the likely useful life of such a facility is fifty years or even longer. In addition it is possible to arrange for LNG storage capacity in excess of operational requirements. In the case of Corrib, which would materially assist in ensuring supply security for a decade or more, the field's developers are in the final stages of their capital expenditure programme and the project is almost certain to go ahead. The situation with Shannon LNG, which would make a much longer-term contribution to supply security, is different. Only about 10% of the ultimate project costs have been incurred and any regulatory changes which impact adversely on project economics could result in its cancellation.

The prospective reduction in interconnector volumes was foreseeable and foreseen, and there is no evidence that the IC2 project was underwritten in the sense that BGE could have had a reasonable expectation that there was no risk that the asset could be stranded. On the contrary, there was a controversy at the time as to whether a second interconnector was in fact needed and the option of LNG importation capacity was available at the time. Moreover domestic producers and possible LNG importers were not made aware at the time that IC2 would never be stranded, or that even more disadvantageously, that IC2 costs would be surcharged onto the onshore network.

A policy of never stranding assets creates an incentive for the regulated firm to invest without due regard to risk. If the state for whatever reason wishes certain investments to take place and to be protected from stranding, this should be clarified to all concerned parties from the outset. It is possible that the Irish government will privatize some regulated monopolies in the years ahead as many other governments have already done. With private regulated entities, there is no escaping clarity, in advance, on this point.

Should a decision be taken to strand no assets, there would be a clear risk that the policy would be seen as discriminatory against domestic producers and LNG importers, since it would depress their potential revenues and could be construed as requiring them to defray the costs of their competitors, in breach of EU competition rules and inconsistent with the creation of a common European energy market. Article 13 of Regulation (EC) 715 of 2009 on Conditions for Access to the Natural Gas Transmission Networks requires the avoidance of cross-subsidies.

“Tariffs, or the methodologies used to calculate them, shall facilitate efficient gas trade and competition, while at the same time avoiding cross-subsidies between network users and providing incentives for investment and maintaining or creating interoperability for transmission networks. Tariffs for network users shall be non-discriminatory and set separately for every entry point into or exit point out of the transmission system.”

There is a critical issue of principle in regulatory design arising from the current tariff review. Retrospective designation of regulated assets as impervious to stranding is a change in the rules of the game and an introduction of major uncertainty into the decisions of investors. It also creates a moral hazard risk for infrastructure providers, whose incentives to economise on capital investment costs which pass through to end-users are diminished.

The most appropriate strategy is one which would see the regulated value of IC2 written down progressively to zero over a period of years, beginning about 2015 when substantial Corrib volumes are likely. Should there be a reduction in volume below the capacity of IC1, a revenue formula designed to remunerate that asset with a supplemental onshore charge could be devised which would place a known cap on import prices. This approach would be a combination of two of the options as identified by the CER.

Section 1: Background

Ireland has come to rely on natural gas for an increasing share of its energy needs since the Kinsale Head field went into production in the late 1970s. Electricity generation is heavily reliant on gas, there is an extensive distribution system reaching most large urban areas for residential customers and there is also significant commercial and industrial demand. However the Kinsale Head field is nearing the end of its life and Irish gas demand is now met almost entirely from imports through twin interconnectors from Scotland in the ownership of the state company BGE. The first interconnector was commissioned in 1993 and the discovery of a substantial new source, the Corrib field 80 kms off Mayo in 1996 was expected to supplement the declining Kinsale Head production and obviate the need for further import capacity. However delays to Corrib production, originally planned for 2001, and projections of increasing gas demand persuaded the authorities to approve a second interconnector from Scotland which was commissioned in 2002. At that time Corrib was expected to be delayed by just a further couple of years. Delays to the Corrib project have continued but most works offshore and onshore have finally been completed and production is now expected to commence during the year 2013. The elapsed time from discovery to production for Corrib will be about seventeen years.

There are also active plans to construct an importation facility for Liquefied Natural Gas in north Kerry. In recent years the supply of LNG from the Arabian Gulf and elsewhere has been expanding. Meanwhile technological developments have permitted sharp increases in North American gas production and this region has already become a less significant importer, and may shortly become an exporter, of LNG. As a result greater supplies have become available for the European market and several new LNG importation facilities have been constructed, or are planned, in the United Kingdom and elsewhere in Europe. Projects are under consideration which will likely result in the development of LNG export facilities on the East coast of the United States and in Russia's European Arctic, aimed in both cases at exports to Europe. As a result of these developments there has been rising optimism in recent years about the availability and cost of natural gas supplies into the European market.

Thus the supply position for natural gas in Ireland is about to alter. Production from Corrib combined with the Kerry LNG importation terminal create the prospect of greatly enhanced supply security and there would be competing supply sources for electricity generators as well as for industrial, commercial and residential users.

Depending on the capacity and commissioning date of the LNG facility and the depletion profile for Corrib, volumes passing through the interconnectors will begin to diminish, possibly to quite low levels in some scenarios, from 2013 onwards. Even if the LNG facility is delayed or deferred, interconnector volumes will decline substantially due to Corrib production alone. It is believed that the Corrib operators will choose a production profile which would substantively deplete the field over a period of ten or twelve years. If no LNG terminal is built, interconnector volumes would begin to recover after the Corrib

peak is reached, perhaps after about 2018, and the interconnectors would again be relied upon for most of Ireland's requirements. If an LNG facility is built and comes on stream towards the end of the present decade, the decline in interconnector volumes is more likely to be permanent.

The interconnectors are regulated assets and the level of cost permitted to be recovered by BGE is capped by the Commission for Energy Regulation. Under current arrangements, tariffs move inversely with volumes, so that BGE recovers (on average) a fixed amount annually, designed to cover its depreciation, interest and operating costs. This arrangement relies on the virtual monopoly position of the interconnector operator in a situation where domestic supply from Kinsale has been small and dwindling. However the advent of substantial domestic supply from Corrib and new importation capacity through the proposed LNG terminal alter the position significantly and the interconnector assets could be stranded and unable to generate current revenue levels at least for the period of Corrib production.

The Commission for Energy Regulation has proposed modifications to the tariffing regime designed to address the issues which arise, which go beyond the impact on BGE revenue. Some of the measures contemplated could have profound implications for the gas market, increasing end-user costs, including electricity costs. There are several alternative modifications to the tariff regime and they would have differing effects on the network owner BGE, on domestic producers such as Corrib and on those planning to become LNG importers. There are also implications for offshore exploration. The protracted delays in developing the Corrib field have damaged the attractiveness of Ireland to potential explorers, reflected in the disappointing take-up at the recent licensing round. Any changes to the tariff regime seen as adding cost for domestic producers to access the market would exacerbate this perception. Tariff changes could also affect security of supply, most clearly if the changes discriminated against the construction of LNG importation facilities in Ireland through imposing interconnector costs on customers who would not be using interconnector capacity.

Section 2: The Natural Gas Industry in Ireland

The discovery by Marathon in 1974 of the Kinsale Head gas-field in shallow waters off the Cork coast remains the only significant hydrocarbon discovery in Ireland to have gone into production. At the time, there was no readymade market for natural gas in Ireland.

Development of the High-Pressure Grid

The development of an Irish high-pressure gas grid commenced in the late 1970s with the construction of the Inch terminal near Cork city to receive gas from Marathon's Kinsale Head field and a line serving volume users in the Cork area, including the NET fertiliser plant and the first gas-fired power stations. A line to Dublin was built in the early 1980s and the system later extended, via a 'ring main', into a proper grid serving the West and Southwest and connecting back to Cork. Along the way, the old town gas companies were converted and new power stations in Dublin and elsewhere came to be fuelled almost exclusively with natural gas. The onshore system has since been extended with a line to Northern Ireland and virtually all significant potential loads, in Northern Ireland as well as in the Republic, are now connected to the system.

Rising volumes through the 1980s, the imminence of decline in Kinsale offtake and the failure to discover significant new reserves meant that gas would have to be imported. BGE was authorised to construct an interconnector to carry gas imports from the United Kingdom and this facility, IC1, was commissioned in 1993. The discovery shortly afterwards of the Corrib field offshore Mayo offered the prospect of a boost to domestic supplies. However delays to this project allied to rising demand and the absence of an LNG importation facility created the prospect of a supply shortfall and it was decided to go ahead with a second interconnector from Scotland, called IC2, and this was commissioned in 2002.

At the time of commissioning, the combined interconnector pipelines were expected to face declining volumes within a few years as Corrib production ramped up. In the event, the interconnectors have transported substantially higher volumes than were expected when IC2 was built, as a result of the protracted delays to Corrib production.

Irish transmission charging is based around differentiated entry tariffs and uniform exit tariffs. All suppliers to the system (currently those using just the interconnector entry points at Moffat and at Inch in Cork) pay tariffs calculated separately for each. They also pay uniform tariffs for use of the onshore system, obviating the need for identification of actual gas flows through the grid.

Tariff Policy since 2001

Prior to the construction of IC1, there was only one entry point to the Irish grid, at Inch, and BGE had been, since the passage of the 1976 Gas Act, the single buyer of Marathon gas. The construction of import capacity necessitated consideration of the terms of access to the market and a new tariff policy was developed. Since the commissioning of IC2, the network owner BGE has been in receipt of an annual regulated sum, currently about €50 million, in respect of its interconnector assets, collected as an entry charge in proportion to the usage of each shipper. This annual revenue is invariant to the total volume transported, so the unit charge fluctuates.

Fluctuations have been limited in recent years given the dominance of interconnector gas in the Irish market. However when Corrib comes on stream, volumes will diminish rapidly and would decline further, and perhaps to quite low levels, should the Shannon LNG terminal be constructed. As Corrib depletes, there could be a volume recovery in the absence LNG importation and of new gas discoveries.

A continuation of the current formula, where €50 million per annum is recoverable by BGE regardless of declining volume, would result in an escalating per-unit charge and a larger wedge between UK and Irish prices.

The Corrib Project

The Shell company is now the operator and principal shareholder in the Corrib field offshore Mayo which was discovered in 1996 by a consortium led by Enterprise, subsequently bought out by Shell. The field has been assessed as containing about two-thirds the volume of gas already produced from the Kinsale Head field. Final determination of the field's recoverable reserves will not be possible until a record of production has been established. Production is expected in 2013, almost ten years behind the original Enterprise schedule.

The Shannon LNG Project

An importation terminal on a 104 hectare site at Ballylongford, on the Shannon estuary in North Kerry, has been under development by Shannon LNG for a number of years. The facility would include a jetty, storage tanks, a re-gasification unit and a 25 km. pipeline connecting to the existing network near Foynes in county Limerick. This pipeline would be capable of serving a new power station at Tarbert should a gas unit be chosen to replace the existing oil-fired station on that site. Tarbert is adjacent to the proposed LNG terminal site at Ballylongford. Planning permission has been granted by An Bord Pleanála under the strategic infrastructure provisions. Construction costs have been estimated at €400 to €500 million.

Planned throughput at the terminal would be capable of meeting about 40% of projected Irish gas demand and the facility would also add to the national storage capacity. Capacity is scalable and the facility could be extended. Construction would take about three years and the earliest feasible commissioning date for the LNG terminal is about 2016.

While the economics of a privately-financed import facility for any product is ultimately a matter for the investors, with the role of regulators confined to matters such as safety and fair market access, the Shannon project has strategic significance. Direct access to LNG supplies, in addition to interconnector access to pipeline gas from the North Sea and via LNG terminals in the UK, would materially enhance physical supply security in Ireland, a matter considered further below. There is also the consideration that exit tariffs on interconnector supplies from Moffat are likely to rise in the years ahead, since pressure has been reducing as the geographical supply/demand balance in the UK has altered.

Exploration

Security of long-term supply would be enhanced should further gas discoveries be made offshore Ireland. However the exploration experience has been discouraging to date and Ireland is not seen as possessing attractive acreage.

Out of roughly 130 exploration wells drilled offshore Ireland over the last fifty years, just two significant commercial finds have been made. The first was the Kinsale Head gas-field, discovered as long ago as 1974 and now almost depleted. The second was the Corrib gas-field off Mayo, discovered in 1996 and still some years away from production. The small Ballycotton field has produced gas through the adjacent Kinsale system but the Seven Heads field, also in the Celtic Sea, encountered technical problems and production is not commercially feasible. The delay from discovery to production at Corrib has been unusually long by the standards of the industry: this has unfortunately sent a disincentive signal to exploration companies and Shell was not an applicant at the recent licensing round. There have been no discoveries of commercially exploitable oil.

The outcome of the recent licensing round was somewhat disappointing, in that the companies awarded licenses to drill exploration wells are virtually all minor players with limited financial and technical resources. There is a simple explanation.

Over the last half-century, about 1000 wells have been drilled offshore Norway and over 2000 offshore the United Kingdom, with a regular and continuing flow of commercial discoveries from both jurisdictions. There are established oil and gas provinces around the world where exploration is actively discouraged. Proven reserves in Saudi Arabia, for example, are so large that foreign exploration companies are actually banned from oil development. Less fortunate countries must take a different tack, offering realistic terms to entice explorers and facilitating early production for any that manage to find commercial reserves. Ireland's licensing terms have not been enough to attract a large

exploration effort given the poor success rate and better opportunities elsewhere. Over the years numerous companies have been awarded Irish licenses but handed them back without drilling.

The Irish government wishes to attract explorers and so must emphasise the potential of the Irish offshore, much of which remains unexplored. Unfortunately official estimates of possible reserves are believed mainly by domestic political activists anxious to argue for tougher licensing terms appropriate to an established hydrocarbon producer. They have made less impression on exploration companies.

In these circumstances, it is important that Ireland offer

- Realistic licensing terms commensurate with Ireland's status as a marginal exploration province;
- Physical planning procedures which offer successful explorers early access to the gas market; and
- Terms of entry to the gas grid which do not penalise domestic producers.

Section 3: Security of Supply

Energy security is an elusive concept and difficult to encapsulate in a single statistic. There are two critical dimensions: exposure to physical supply interruption and exposure to the risk of adverse price movements. Most advanced economies are reliant on imported energy to a substantial degree and many are further exposed to a small set of supply sources or physical importation technologies (Frondel and Schmidt (2008)).

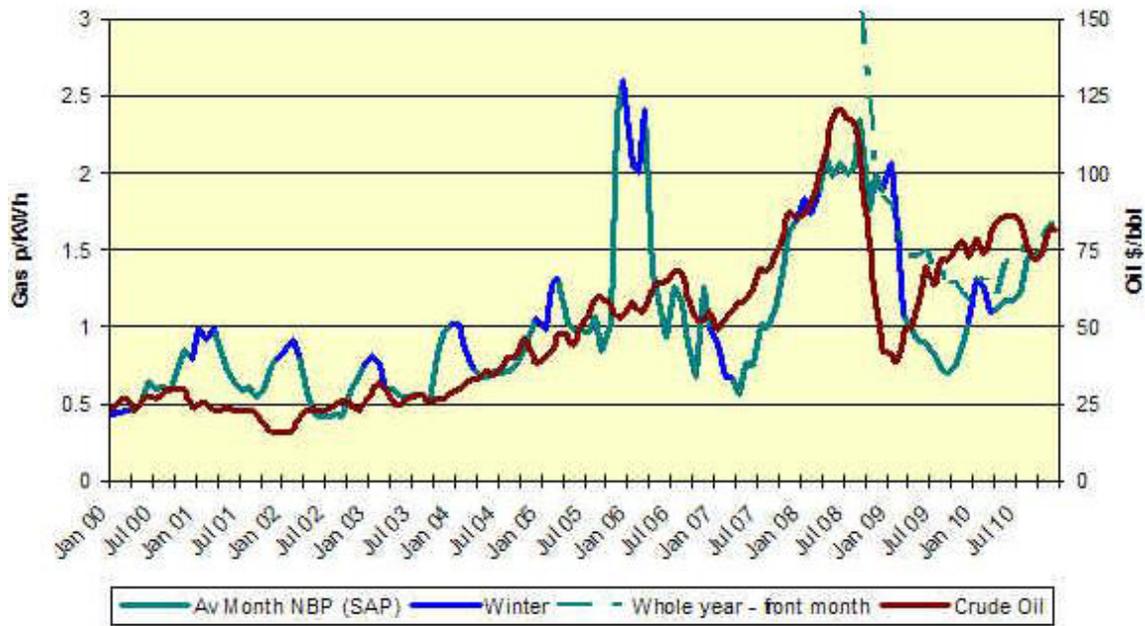
It is essential to distinguish between *physical* supply security and exposure to price volatility or *economic* supply security. A high level of redundancy in the delivery infrastructure for gas, including multiple import routes through pipelines or LNG tankers as well as domestic production and storage will enhance physical security but does little to mitigate exposure to price risks in the case of commodities which will be priced to the world market. A country which relies heavily on energy imports faces an unavoidable exposure to energy prices. The controllable element in cost is principally capital charges. Excess investment in regulated pipelines and interconnectors, as well as in electricity transmission and distribution networks, add to the import cost to the disadvantage of domestic consumers and businesses. In contrast investment in ‘merchant’ assets, including generating stations and LNG importation terminals, is on the hazard and at the risk of investors.

Prior to the construction of the first interconnector, Ireland’s gas supplies were dependent on a single offshore pipeline from the Kinsale Head field to Inch strand in Cork. As that field was depleted dependence shifted to the single interconnector (subsequently twinned) from Scotland, linked to a single onshore line at Moffat. Supplies from Scotland originate in further pipelines linking into the UK system from North Sea producers in both British and Norwegian sectors, from LNG terminals and by interconnectors from continental Europe delivering gas from Russia and elsewhere.

While Ireland’s gas supplies appear not to have enjoyed a high level of physical security there has not been a supply disruption in over thirty years. High-pressure gas pipelines, properly constructed and maintained, are not particularly vulnerable to disruption and the risks of physical loss of supply are low. Repair timelines for gas pipelines are short. There are risks also with the supply chain through LNG importation and from domestic gas-fields but cases of supply disruption have also been rare. The reality is that Ireland has been reliant on single pipelines, either at Inch or subsequently at Moffat, for most of the country’s supplies over the last thirty years, without incident.

There is an economic as well as a physical aspect to supply security, in the sense that an importing country is exposed to fluctuations in the real cost of energy. This exposure can be substantial and is not mitigated by domestic production which trades at world prices. It is however mitigated by diversity in reliance on fuel sources, particularly on sources whose prices are not highly correlated.

UK Wholesale Gas vs Oil Prices 2000-2010



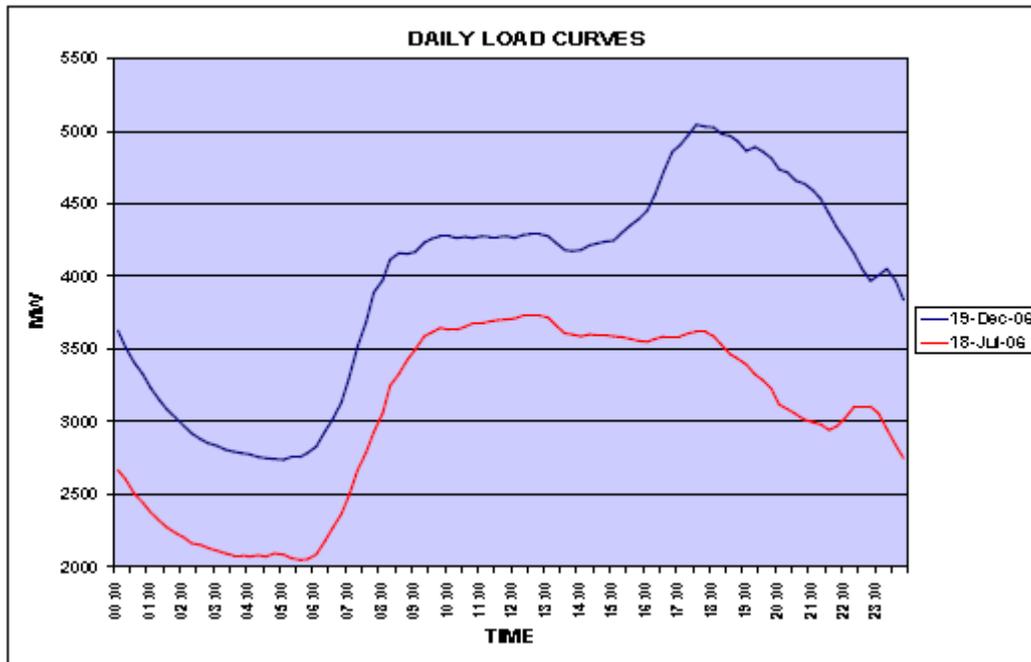
Gas and oil prices have begun to de-couple in Europe in recent years as spot markets have begun to replace longer-term oil-indexed contracts. In Ireland gas demand for power generation has at times fluctuated as relative price movements alter the merit order of power stations (McCarthy, O’Dwyer and Troy (2006)). This pattern was particularly noticeable in the middle years of the last decade when gas prices spiked.

Supply disruptions due to a dispute between Russia and Ukraine over gas prices and a fire at a major UK storage unit caused a major gas price spike in 2006. The daily and seasonal patterns of electricity demand fluctuate so much that there is considerable scope in the optimization of dispatch, to substitute away from fuels as they become relatively costly.

Electricity demand is lower in Summer than in Winter and falls away sharply through the evenings to a low after midnight in all seasons. Eirgrid data show that the Winter peak can be more than double the Summer trough, so there is scope to economise on fuel costs through the scheduling of power stations when fuel cost disparities make this worthwhile. Gas is normally cheaper than oil but there have been occasions when this was not so. When gas is more expensive, the gas stations get relegated down the merit order and are used only in the peak hours. In addition to the shifting of load between mono-fuelled stations there are also some dual-fired units.

If oil and gas prices move in lock step, this flexibility is of little value but there have already been episodes where the merit order shifted. Traditionally long-term gas contracts in Europe were priced against indices of oil prices but market forces have been de-

coupling the two markets and this is expected to continue. Thus Ireland's exposure to gas prices through dependence on gas for power generation is capable of being mitigated to a degree through shifting fuel usage in response to price spikes.



In countries such as France with a large installed nuclear capacity, or in Norway with extensive hydroelectric capacity, there is an additional channel through which price risks are reduced.

Production from the Corrib field or from any other domestic supply sources which might be discovered will enhance physical supply security for the period of depletion. In the case of Corrib this could be as short as ten or twelve years, after which supply reliance would return to the interconnectors. The expectation is that Shell will seek to ramp up Corrib production quickly with a view to early depletion, although there can be no clarity on depletion profiles until the field has established a record of actual production.

An LNG terminal makes a more durable contribution to supply security since the likely useful life of such a facility is fifty years or even longer. In addition it is possible to arrange for LNG storage capacity in excess of operational requirements. It is also feasible, as with Kinsale, that depleted gas-fields can be deployed as storage facilities, creating an additional margin of physical supply security. Neither Corrib nor the Kerry LNG project would alter the exposure to fluctuations in world prices.

Irish interconnector supplies, including those to Northern Ireland, come through a single onshore pipeline in southwest Scotland (belonging to BGE) connecting from the UK grid to the facility at Moffat. The construction of additional redundancy in this onshore system in Scotland has been mooted from time to time and the CER released a consultation document on November 28th last (CER (2011c)). Once Corrib production is commenced the value of incremental supply security from additional works onshore in Scotland is diminished and that value would be further reduced should an Irish LNG terminal be constructed. The costs of additional physical security from such an investment need to be compared carefully with benefits, bearing in mind the low probability of disruption and the prospects of improved physical security deriving from the imminent commencement of Corrib production and prospectively from the advent of LNG importation capacity. In addition a new 500MW electricity interconnector linking Ireland to the UK grid is due to be commissioned late next year, a significant backup to current reliance on gas for power generation. Any further investment onshore in Scotland could be stranded on commissioning.

EU security of supply policy

The European Union has adopted, in EU Regulation 994/2010, a set of measures designed to enhance security of supply through integrating European gas markets and to ensure fair access to those markets. (European Union (2010)). In its statement of June 24 2010 on the agreed text, the EU Council noted that:

‘Sufficient and diversified gas infrastructure within a Member State and across the Union including in particular new infrastructure connecting current isolated systems forming gas islands to their neighbouring Member States is essential for tackling supply interruptions. Common minimum criteria on security of gas supply should ensure a level playing field for security of gas supply while taking into account national or regional specificities and should create significant incentives to build the necessary infrastructure and to improve the level of preparedness in case of crisis. Demand side measures such as fuel switching may have a valuable role to play in ensuring energy security where they can be applied quickly and reduce demand appreciably to react to a supply disruption. The efficient use of energy should be further promoted, in particular where demand side measures are needed.’

It is essential that any measures taken in Ireland to address the problems arising from declining demand for interconnector capacity be consistent with the European objectives of a ‘..level playing field..’ and the creation of ‘..significant incentives to build the necessary infrastructure.’

Section 4: Tariff Policy Options

Four options for addressing the interconnector tariff issue have been identified by the CER.

- a) Maintain the existing arrangements where all of the IC costs are recovered from IC capacity bookings;
- b) Strand all or part of the IC costs. The unit tariff would be capped, and BGE would bear the costs that cannot be recovered from the IC tariffs. Costs that cannot be recovered from the IC tariffs would be ‘stranded’, that is, the owner would not be compensated for these costs;
- c) Set a ceiling for IC tariff revenues, and recover any remaining IC costs from the onshore exit points, in effect a tax on consumers;
- d) Eliminate the IC tariff entirely, and recover all IC costs from non-IC entry points, in effect a tax on domestic production and on importers who do not use the ICs.

These alternatives would have very different effects on the network owners, domestic producers, LNG importers, potential explorers, on security of supply and on charges to end-users of gas in Ireland. Electricity costs would also be affected. Conditions of competition in the gas market would be impacted to such a degree as to affect the attractiveness of participation.

In the case of Corrib, which would materially assist in ensuring supply security for a decade or more, the field’s developers are in the final stages of their capital expenditure programme and the project is almost certain to go ahead. The situation with Shannon LNG, which would make a much longer-term contribution to supply security, is different. Only about 10% of the ultimate project costs have been incurred and any regulatory changes which impact adversely on project economics could result in its cancellation.

Options c) and d) appear attractive from the perspective of the network operator, since they preserve existing revenue. We now consider the features of the four alternatives proposed.

Option a) Maintenance of the Existing Arrangement.

Option a) would see IC charges double if volumes halved and charges trebled if volumes fell to one-third of the current throughput. It is entirely possible that volumes could fall substantially so very large increases in IC tariffs are possible.

It should be borne in mind that the Moffat exit tariff is likely to increase in any event. As a result of declining St. Fergus gas flows and increasing supplies, including LNG imports, from the south of the UK, pressure at Moffat is declining and National Grid has forecast that the capacity charge for the Moffat exit point will increase by a factor of 188 by 2014/15 (National Grid (2011)). Under this option a substantial wedge could be driven between UK and Irish prices. Corrib gas is almost certain to come on stream during 2013/14, barring some unforeseen technical problem since all legal and planning issues appear to have finally been resolved. This will push UK gas back to Scotland and drive up the cost of imported gas, raising the ceiling against which Corrib gas will be priced. Interconnector gas would continue to cap prices but at a level which would rise as Corrib output rose.

The advent of LNG imports in competition with domestic production would ameliorate this situation but the price dynamics would be complex. The incentive for both Corrib and the LNG importer would be to maximise throughput and interconnector volumes could fall to very low levels, with very high tariffs, in certain circumstances. Irish prices would be determined through competition between domestic producers and LNG importers, should there be any, without an assured price cap provided by interconnector supplies. The CER has expressed reluctance to entertain this option and their concerns are understandable.

Option b) Strand all or part of the IC costs.

A tariff policy which always ensures full recovery of capital expenditure from current customers, including provision for capacity expansion, does not mimic the market as an incentive regulation regime is supposed to do.

The Irish network monopolies in both electricity and natural gas have been regulated over the years in a manner which has permitted them to expand their balance sheets substantially without the need for shareholder injections of equity. Any company which can do this, without worsening the debt/equity ratio, is effectively financing investment through retained earnings. Indeed the regulatory regime appears to explicitly permit the recovery of revenues from current customers designed to finance balance sheet expansion.

The April 2011 consultation document (Comission for Energy Regulation (2011)) contains, in Section 2.6, the following statement:

"The RAB should also be such that it is capable of providing sufficient revenue when applying the cost of capital to it in order to ensure that the business is able to fund appropriate new investments."

The calculation of the RAB (regulated asset base) is central to the economic regulation of natural monopolies. These are capital-intensive businesses and tariffs are dominated by charges relating to capital.

Incentive regulation as commonly understood (see Joskow (2006)) permits to operators of natural monopoly assets recovery of costs arising from the *existing capital stock* only, including an adequate rate of return on capital above the risk-free rate. This latter is intended to provide the *incentive* to raise additional capital but not to provide the capital itself, upfront and in advance of the commissioning of new assets. No business operating in a market environment can recover future capital expenditures from current customers, and any regulatory regime which facilitates such recovery does not replicate market disciplines.

This is related to the question of stranding assets. If the cost of capital afforded to regulated firms contains an adequate premium over the risk-free rate, that premium is intended to reflect all risks attendant on running the business, including the risks that some assets will not enjoy the volumes predicted for them. If all risks are to be absorbed in tariffs to customers, the case for allowing a cost of capital exceeding the risk-free rate is undermined. More specifically, the justification for stranding, or partly stranding, regulated assets derives from the use of rates of return which exceed risk-free rates, which has routinely been the practice in Ireland and elsewhere. To put the same point equivalently, if the operators of natural monopoly assets are regulated in a manner which eliminates risk, they cannot additionally be afforded a rate of return which builds in a risk premium. The principal business risk in a capital-intensive business is precisely that volumes may fall short of expectations.

The CER has argued against any stranding of IC assets in its consultation documents. In its Consultation Paper CER/11/112 it is stated at page 27 (Commission for Energy Regulation (2011)):

‘ “Strand IC’s” is another option that has been ruled out, as far as the CER is concerned. This was ruled out in 2008 when as part of CER/08/207 the CER noted that *‘any intervention in the treatment of the ICs will involve a solution where BGN will recover their required revenues from the market and so stranding will not be considered as an option.* The ICs construction and costs were approved by the State and the CER does not consider that it has the power to change this. Thus, any consideration of stranding the ICs would not be a matter for the CER. It would ultimately be a matter for the shareholder. The CER corresponded in 2008 with the Department of Communications, Energy and Natural Resources on the background to the original 2001 Government decision to invest in IC2, which of course, predated the extension of CER’s regulatory remit to the gas sector. Ultimately the Government approved the decision for the then *de facto* TSO to invest in IC2 on the express grounds of national security of supply. Stranding IC2 is therefore only an option the Government as shareholder can consider. As a general regulatory principle it would be considered bad practice for an economic regulator to allow major infrastructural investments that have received prior approval to be subsequently stranded. Apart from the message of fairness, this would send a bad message to potential investors and create uncertainty. The level of the WACC (weighted average cost of capital) for BGN might have to be reopened as stranding part of the RAB could create financeability issues.’

Whether IC2 was constructed on the basis of zero risk of stranding to BGE is ultimately a matter to be determined on the facts. The project was not undertaken on the basis of long-term capacity contracts with customers, since it is known that no such contracts are in place. Nor is it in the public domain that any guarantees as to future full cost recovery were given to BGE by the government or by the CER. On the contrary, potential competitors were at no stage informed that the costs of potentially strandable assets would be imposed on them, or on the broader market, through onshore exit tariffs.

Was the IC2 Asset Underwritten?

In their July 2011 consultation paper, CER/11/112, the CER described the interconnectors as an “underwritten asset” and appear to see themselves as constrained to ensure that current revenues to BGE are maintained in any new tariff formula. The Government press release of the 27th of February 2001 announced that the Government was allowing BGE to proceed with its proposal to build the second interconnector:

“The Minister for Public Enterprise, Mary O'Rourke TD, and Mr. Joe Jacob, TD, Minister of State at the Department today announced that Bord Gais Eireann is to proceed with its proposal for a second natural gas interconnector from Scotland to Dublin. In a significant development the Ministers said the project *would be funded through Bord Gais and private sector investment.*” (italics added). The press release went on to say:

“On the question of gas transmission tariffs, Minister Jacob said that, following consideration of the report prepared by The Brattle Group and the extensive round of public consultations his Department had undertaken, he considered postalisation of on-shore tariffs to be a desirable and necessary policy objective. He intended that on-shore tariffs would be based on this principle with separate entry tariffs, in line with the recommendations of the Brattle Report. "Subject to finalising some legal and technical issues, I will be issuing tariff directives on this basis to Bord Gais shortly".

The Minister then issued tariff directives to BGE in November 2001 which indicated that only users of the interconnectors would pay for the interconnectors; that the tariff directives were made by the Government with full knowledge that Corrib was coming online; and that the tariff directives were made subsequent to BGE proceeding with IC2. There appears to be no trace in the written record of any ‘underwriting’ of the IC2 asset.

The CER appears to believe that it has no role, short of a government directive, in deeming any interconnector assets to be stranded. But the government appears to believe that it has no role either, and that the CER is independent and free to take whatever decision it thinks best, as evidenced in recent correspondence from the Minister responsible to Deputy Deenihan and published in the press.

The CER statement that ‘As a general regulatory principle it would be considered bad practice for an economic regulator to allow major infrastructural investments that have received prior approval to be subsequently stranded’ is particularly troublesome. The prior approval was not, so far as is in the public domain, a guarantee of subsequent revision to the tariff rules permitting full cost recovery, despite a decline in volumes that was foreseeable at the time. Would the CER take the same view if the ‘prior approval’ came from a shareholder other than the state?

Equally striking is the final sentence quoted above: ‘The level of the WACC for BGN might have to be reopened as stranding part of the RAB could create financeability issues.’ The suggestion here is that a regulated infrastructure provider should receive automatic compensation for increases in capital cost, due to declining volumes and revenues, which create financeability issues. Any such arrangement would amount to cost-plus regulation, as distinct from the incentive price-cap regulation which is purportedly the model pursued by CER and other Irish economic regulators.

Given the high likelihood, when IC2 was built, that volume declines were likely in due course, the apparent absence of any underwriting of BGE’s investment and the employment of rates of return allowing a risk premium, the CER has no basis for rejecting any solution involving the stranding of interconnector assets, in particular those relating to IC2.

Option c) Set a ceiling for the IC tariff.

The CER’s third option envisages a cap on per-unit charges, with unrecovered revenue to BGE collected through an onshore exit charge. The impact of this option on market prices and on the economics of the Shannon project would depend on the quantum of interconnector costs deemed to be non-recoverable.

Option d) Eliminate the IC tariff entirely.

Finally the fourth option would see the IC charges scrapped entirely (presumably the Inch entry charge would have to go too) with BGE compensated through an even higher onshore exit charge than would arise under option c). Both options c) and d) involve interconnector revenues to BGE paid by users of the onshore system who do not import their gas over BGE’s importation facilities, and thus represent a break in Irish tariff policy and potential conflict with EU requirements.

The Incidence of Higher Onshore Exit Charges

Domestic producers such as Corrib or alternative importers such as Shannon LNG cannot expect to price above the import price and will have to offer some element of price

advantage to attract existing customers, such as power generators, away from interconnector gas. This is what all domestic producers and all competing importers do, for all products. Domestic production of, for example, horticultural products, is only viable if the producers can match or better the price of importers, inclusive of importation costs. Thus growers in North County Dublin cannot price above the landed price of Cypriot potatoes. If they cannot match or better this price, domestic production is not viable and will cease. This observation explains the absence of a citrus fruit industry in North County Dublin.

Under the CER's options c) and d), domestic producers *and* alternative importers will be disadvantaged, dramatically so under option d), since interconnector importers are having their costs paid through an indirect tax on all consumers, including the consumers of domestic output. This is effectively a policy of import subsidy. Alternative importers, such as Shannon LNG, are similarly disadvantaged, since they must pay their importation costs in full while their competitors have their costs defrayed (under option c)) or entirely eliminated (under option d)), through a tax on all consumers.

Article 13 of Regulation (EC) 715 of 2009 on Conditions for Access to the Natural Gas Transmission Networks requires the avoidance of cross-subsidies.

“Tariffs, or the methodologies used to calculate them, shall facilitate efficient gas trade and competition, while at the same time avoiding cross-subsidies between network users and providing incentives for investment and maintaining or creating interoperability for transmission networks. Tariffs for network users shall be non-discriminatory and set separately for every entry point into or exit point out of the transmission system.”

It is true of course that the interconnectors provide more than just capacity. They also provide supply security and would provide valuable back-up to both Corrib and Shannon LNG when those projects come on stream. But this argument applies to all suppliers of domestic production and storage or of alternative import infrastructure. Thus some coherent system of reserve capacity payments, which would no doubt partially offset one another, could be envisaged, which might compensate for some of BGE's stranded asset costs. But the CER has made no effort to outline such a system, opting instead for an assertion that no BGE assets be stranded.

Section 5: Regulated Assets and Moral Hazard

The regulator's preference for the non-stranding of assets in the current case seems to drive the selection of the recommended tariff regime. Where natural monopoly assets are regulated in a manner which eliminates all, or a substantial part, of the risk of assets being stranded, the monopoly operator is exposed to a form of moral hazard, with powerful incentives to invest excessively. The operator has been provided with insurance against possible loss and any arrangement of this type has the potential to create moral hazard, in this case in the form of an incentive to over-invest or to gold-plate investments. There is an important onus on regulators to devise tariff formulae and rules about what can be included in the regulated asset base which protect against this risk.

In Ireland, the airports regulator has been involved in open conflict, including High Court cases, with the regulated airports operator, Aer Rianta (now the DAA) regarding the scale of terminal investments at Cork and Dublin airports and on the recovery of costs arising from investments on a scale opposed by the regulator. This same issue arises in the case of BGE's interconnectors and in other areas involving regulated grid assets, for example in relation to extensions to the high-voltage electricity grid designed to facilitate intermittent power generation. The regulator's decisions on four matters are critical: the valuation of the regulated asset base, the pre-funding of future investments, the allowable rates of return and the stranding of assets.

Valuation of the RAB

Since regulated businesses are typically capital-intensive, the computation of the asset base on which revenues are to be recouped is critical. The practice in Ireland has been to update historical costs by reference to indices of inflation while deducting an allowance for depreciation. It can happen that the regulated asset base can change little in nominal terms under these arrangements. For example, a 2% inflation rate offsets precisely a 50-year straight-line depreciation schedule.

A critical input is the inflation index used to update historical capital asset values. It has been the practice in Ireland to use indices of consumer prices for this purpose. Where the assets in question consist of concrete and steel, replacement values are not well-measured by consumer price numbers, which reflect the cost of food, clothing, entertainment, drink, tobacco and the other items which form the expenditure pattern of the typical household. Particularly where technical change has been significant, there is a risk that consumer price index numbers will over-index the historic cost of capital in the energy industry.

When asset values are deemed to attract remuneration at a rate of return which equates to, or exceeds, the enterprise cost of capital, there will be an incentive to excess investment, as well as an incentive to classify assets into the regulated business and out of non-regulated businesses wherever possible. The recent report of the Committee on State

Assets and Liabilities (Department of Finance (2010)) recommended a review of economic regulatory agencies in Ireland. Should such a review be undertaken, the computation of regulated asset bases for the various regulated entities would be an important component.

Pre-Funding of Future Investments

Companies which are natural monopolies, or which otherwise enjoy a dominant position necessitating regulation, are typically allowed to earn returns adequate to remunerate their *existing capital*. If this return is adequate, these companies are enabled to recruit additional providers of capital in the markets on a commercial basis.

Some regulators appear to go beyond this and facilitate these companies in accumulating funds to finance future capital investment without recourse to shareholders or even to providers of debt capital. This is a tax on current consumers and does not mimic market outcomes, as incentive regulation should seek to do.

Allowable Rates of Return

It has become conventional for regulators to employ variants of the CAPM model (capital asset pricing model) in computing allowable rates of return on regulated assets, including a pass-through of actual bond market funding costs. Where these costs are incurred on a firm-wide basis and where the firm is engaged in unregulated as well as regulated activities, the cost of bond finance will reflect the perceived riskiness of the unregulated activities. Where the funding cost applicable to the segregated balance sheet of the regulated business is assessed to be lower than the aggregate funding cost, the former is all that should logically be allowed and regulated entities should be required to segregate their balance sheets. Not to do so permits subsidization of the cost of capital to the unregulated business from the customers of the regulated business, and an incentive to expand the overall balance sheet into riskier activities.

In particular the allowable cost-of-capital in regulatory determinations should not be allowed to reflect any increase in funding costs deriving from unsuccessful investments outside the core regulated business. Most Irish state companies are multi-product firms, with only a portion of their business in the regulated monopoly sector. For example ESB owns power stations outside the state, BGE is involved in wind farms, Dublin Airport Authority has overseas operations. The firms tend to borrow at group level and the balance sheets are not segregated. This gives rise to the risk of hidden cross-subsidisation from the regulated to the unregulated businesses through the cost of capital and is not good regulatory practice.

If the regulatory regime includes generous treatment of losses arising from any source, including compensation for stranded assets, this should be reflected in a lower allowable rate of return, in particular a lower bond rate, in the CAPM calculations. If the regulated

business is rendered risk-free, or at least low-risk, through regulatory action, this should have consequences for allowable rates of return.

Stranding of Assets

A policy of never stranding assets creates an incentive for the regulated firm to invest without due regard to risk. If the state for whatever reason wishes certain investments to take place and to be protected from stranding, this should be clarified to all concerned parties from the outset. It is possible that the Irish government will privatize some regulated monopolies in the years ahead as many other governments have already done. With private regulated entities, there is no escaping clarity, in advance, on this point.

Section 6: The Imperative of Controlling Energy Costs

In an open trading economy which will inevitably import a substantial portion of raw materials, including energy, it is essential to ensure that these input costs are minimized. The consequences of placing this consideration at the heart of Irish energy policy were outlined in the recent report of the Committee on State Assets and Liabilities (Department of Finance (2011)) and the energy policy recommendations from the Irish Academy of Engineering (IAE (2009)).

The IAE report notes that Irish energy costs are already uncompetitive and that excessive capital expenditure on network assets will add further to cost disadvantages. A policy of high capital spending on regulated energy infrastructure is no longer justified in the light of changed economic circumstances:

‘Current capital expenditure plans for regulated investment particularly in the electricity sector, are based on economic growth projections which are far too optimistic. It is perfectly possible for example that Irish electricity demand will not recover to 2007 levels until as late as 2014.

Against this background capital expenditure within the control of policymakers and regulators should be frozen immediately pending a full review of all investment projects based on robust techno-economic analysis. Continuing this expenditure and the creation of unnecessary network capacity in the short term, for example, will impact significantly on electricity prices as investors legitimately seek to recover their investment costs. Keynesian stimulus arguments are not applicable to this expenditure as the bulk of it is expended on imports. Most EU utilities are currently engaged in this exercise (freezing capital expenditure for example) as they are keenly aware of the potential commercial losses likely to arise from over investment against a declining demand.’

The Academy notes the substantial network expenditures planned to accommodate additional wind-powered generation and questions whether adequate economic analyses are available to justify these plans. They also argue that there is no longer evidence of any generalized shortage of generation capacity, given the weakness of power demand. There is no evidence, as of end-2011, that electricity demand growth has resumed.

The State Assets report also cautioned against excessive investment in energy assets, noting that many plans still current in Irish state companies date from the National Development Plan finalized in 2005. This plan proceeded on the basis of steady GDP growth into the longer term at rates of 4% to 4.5% per annum. In 2012, recent estimates are that GDP will be at least 25% below the figures assumed in the National Development Plan, due to the sharp declines in activity from 2008 onwards in contrast to the vigorous expansion assumed in the Plan.

The result is a situation in which Irish energy costs, which can be thought of as world prices plus the costs of importation, transmission, conversion and distribution, need to be contained in order to avoid further loss of competitiveness. This requires vigilance most of all in the approval processes of the regulator regarding expansion in the regulated asset base of the regulated natural monopolies and in the returns which they are allowed on their historical assets-in-place.

Section 7: Conclusions and Recommendations

The current review by CER of the likely economic consequences of alternative tariff regimes in the gas industry needs to be informed above all by considerations of overall economic competitiveness. The starting point is a level of gas and electricity prices which inhibits the competitive position of the traded sector.

The advent of Corrib gas will enhance supply diversity for a decade or more. Importation of LNG, particularly given the improved prospects for the LNG market internationally, offers an even more decisive and longer-term contribution. Government should also encourage commercial storage and additional exploration effort. The apparent preference of the CER for the full remuneration of BGE interconnector assets, despite the absence of any formal underwriting of IC2 by either customers or government, is not consistent with a cost-reducing remit for energy policy.

The prospective reduction in interconnector volumes was foreseeable and foreseen, and there is no evidence that the IC2 project was underwritten in the sense that BGE could have had a reasonable expectation that there was no risk that the asset could be stranded. On the contrary, there was a controversy at the time as to whether a second interconnector was in fact needed and the option of LNG importation capacity was available at the time. Moreover domestic producers and possible LNG importers were not made aware at the time that IC2 would never be stranded, or that even more disadvantageously, that IC2 costs would be surcharged onto the onshore network.

There is a critical issue of principle in regulatory design arising from the current tariff review. Retrospective designation of regulated assets as impervious to stranding is a change in the rules of the game and an introduction of major uncertainty into the decisions of investors. It also creates a moral hazard risk for infrastructure providers, whose incentives to economise on capital investment costs which pass through to end-users are diminished.

The most appropriate strategy is one which would see the regulated value of IC2 written down progressively to zero over a period of years, beginning about 2015 when substantial Corrib volumes are likely. Should there be a reduction in volume below the capacity of IC1, a revenue formula designed to remunerate that asset with a supplemental onshore charge could be devised which would place a known cap on import prices. This approach would be a combination of options b) and c) as identified by the CER.

Should a decision be taken to strand no assets, there would be a clear risk that the policy would be seen as discriminatory against domestic producers and LNG importers, since it would depress their potential revenues and could be construed as requiring them to defray the costs of their competitors, in breach of EU competition rules and inconsistent with the creation of a common European energy market.

It would in addition undermine the allowance to BGE of a risk premium in their cost of capital, since the regulatory regime would have removed a principal business risk. Specifically, if option c) were to be elevated into a central regulatory principle, the detailed workings of the CAPM model used to determine allowable rates of return to BGE and other Irish natural monopolies would have to be re-visited and charges reduced. There is in any event a need to ensure that regulated asset bases are computed rigorously and without any taint of cost-plus pricing, and that the regulated balance-sheet is segregated from the free market activities of the companies concerned.

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