PC4 Executive Summary

PC4 SD001

02/12/2016

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1 Background and context

Gas Networks Ireland builds, operates and maintains the natural gas network in Ireland, transporting 27% of Ireland's primary energy requirement

1.1 Introduction to Gas Networks Ireland

Gas Networks Ireland is responsible for the safe, reliable and efficient transportation of natural gas through its network on behalf of all gas customers. Development of the national gas network began in 1976 and the network now consists of:

- 1,724km of high pressure onshore transmission pipelines in Ireland and Scotland;
- 412km of subsea interconnectors between Ireland and Scotland;
- 11,499km of low pressure distribution pipelines;
- three compressor stations;
- connection to three entry points, including the newest entry point, the Corrib gas field;
- 176 Above Ground Installations on the transmission network;
- 933 District Regulator Installations on the distribution network;
- connections to the transmission system for 51 large industrial and commercial installations, including 12 power stations; and
- connections to the distribution system for c.678,000 users across Ireland.

Gas Networks Ireland and Irish Water are part of the Ervia organisation. Ervia is led by the Ervia Group Centre, which sets the strategic direction of the Group. Ervia Group Centre, Gas Networks Ireland and Irish Water are supported by the Shared Services Centre and Major Projects divisions.

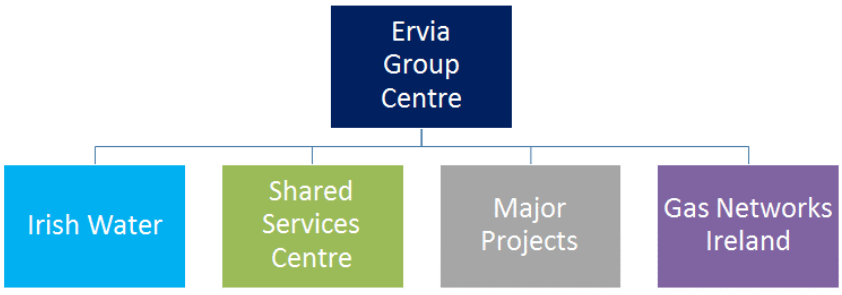

Figure 1: Ervia Organisation Structure[1]

[1] Gas Networks Ireland includes GNI (UK) Limited, which owns part of the Irish gas network located in Scotland, and is a wholly owned subsidiary of Gas Networks Ireland.

1.2 Gas Networks Ireland delivered its PC3 commitments

Over the PC3[2] period, Gas Networks Ireland achieved each of the objectives it committed to at the outset of PC3, while at the same time prioritising and delivering only necessary and cost effective investment. As costs rose over the course of PC3, resulting from additional work volumes, it is clear that Opex allowances were short of those required to run the business.

In doing so Gas Networks Ireland has put in place the foundations necessary for the delivery of its PC4 objectives. The key commitments identified at the time of the PC3 review were:

- promoting competitiveness;
- maintaining a strong focus on customers;
- delivering a safe and secure network;
- promoting innovation and sustainability;
- delivering the European Energy Third Package;
- managing the financial crisis and financing activities efficiently; and
- embedding its new organisational structure.

Promoting competiveness

Gas Networks Ireland recognises the need to maintain the competitiveness of its operating costs[3] and to drive for maximum efficiencies for the benefit of its customers. Over PC3, Gas Networks Ireland implemented a range of measures to achieve efficiencies across the business. These included changes to the outsourcing model, implementing a strategic review of the pay model, procurement efficiencies and the restructuring of support services. These and other measures have delivered savings of €95m. However, despite seeking to meet challenging PC3 Opex allowances, Gas Networks Ireland was not able to fully do so. As costs rose over the course of PC3 (reflecting the work priorities set out in this submission), it is clear that the Opex allowance was materially short of those required to run the business by the last year of PC3.

Maintaining a strong focus on customers

Gas Networks Ireland delivers a best-in-class service to over 678,000 domestic and commercial customers. In the first four years of PC3 Gas Networks Ireland handled:

- c. 435,000 switches of gas supplier;
- c. 295,000 appointments to conduct work on the customers' premises;
- c. 114,000 responses to customers' homes to investigate reported gas escapes and possible loss of gas supplies;
- c. 55,000 temporary and permanent road surface reinstatements; and
- c.1,249,000 customer phone calls.

[2] PC3 was Gas Networks Ireland's third regulated revenue review period; running from October 2012 to October 2017.
[3] Actual costs up to 15/16 are in nominal monies and forecasts for 16/17 onwards are in 15/16 monies

Gas Networks Ireland has excellent levels of performance in respect of its published customer charter service standards and commitments. During PC3, Gas Networks Ireland won four international awards for excellence in customer service.

Delivering a safe and secure network

Safety is a core value for Gas Networks Ireland. During PC3 Gas Networks Ireland's comprehensive Safety Management System was accredited to OHSAS 18001. Gas Networks Ireland provides a best in class emergency response service with an average response time to Public Reported Escapes of 28 minutes. Gas Networks Ireland has, over the course of PC3, delivered successful national media campaigns to promote safety messages including the dangers of meter tampering, use of approved Registered Gas Installers and carbon monoxide awareness.

Gas Networks Ireland delivered significant enhancements to security of supply of the gas network over PC3. In 2015 Gas Networks Ireland facilitated the first flow of gas from the Corrib gas field into Ireland's natural gas network. The certification of the Mayo-Galway linkline made the full capacity of the Corrib gas field available in 2016. Corrib gas will meet up to 55% of Ireland's annual gas needs for several years.[4] Gas Networks Ireland secured €33.7m of European grant funding to complete the twinning of the Scottish onshore system, de-risking the most likely failure mode in the Interconnector system. This infrastructure project has been approved by the CER and will be commissioned in 2017.

Promoting innovation and sustainability

Utilising the innovation fund, Gas Networks Ireland has undertaken projects to expand the role of natural gas in transportation and to develop the renewable gas sector in Ireland. Gas Networks Ireland has carried out several CNG trials with industry and has commenced the installation of three fast fill CNG refuelling stations in 2016. Gas Networks Ireland created greater awareness about renewable gas and is working to facilitate the first facility for injecting renewable gas directly into the network. Gas Networks Ireland, through the innovation fund, has also supported several decarbonisation research projects on gas quality, renewable gas feed stocks and the potential for "power-to-gas" (converting electricity to hydrogen).

Delivering the European Third Energy Package

Working closely with industry stakeholders and regulators in three jurisdictions, Gas Networks Ireland implemented the European Network Codes for the benefit of all Irish shippers and customers. This significant body of work saw:

- harmonisation of commercial gas rules across the EU;
- bundling of transmission capacity for auction;
- streamlining of the nomination process; and
- minimisation of the impact on shippers of physical over / under delivery of gas.

[4] See Gas Networks Ireland Network Development Plan available at http://www.gasnetworks.ie/Global/Gas%20Industry/BGN%20Gas%20Industry%20Website%20Content/Gas%20Industry%20Documents/GNI_NetworkDevPlan_2016.pdf

To achieve compliance with the Third Energy Package, Ervia undertook significant restructuring and created Gas Networks Ireland as a standalone gas network business within the Ervia group. The CER certified Gas Networks Ireland as a fully ownership unbundled transmission system operator in March 2016.

Managing the financial crisis and financing activities efficiently

During the financial crisis experienced over the PC3 period, Gas Networks Ireland, through prudent treasury management, maintained an investment grade credit rating with both Moody's and S&P. This enabled Gas Networks Ireland to access debt markets and fund its capital expenditure. Through an adjustment mechanism, the benefit of improving capital market conditions was passed on to customers through lower tariffs.

Embedding its new organisational structure

Gas Networks Ireland is part of the Ervia group. Ervia has moved from being an integrated energy company to a regulated infrastructure company responsible for national gas and water services in Ireland. The Ervia Group Centre sets the strategic direction for the company, manages risks, supports and challenges the performance of the operating subsidiaries, and provides corporate governance. During the PC3 period two new support divisions were established, the Shared Services Centre and Major Projects.

In PC2, Gas Networks Ireland implemented a High Performance Utility model to enable the company to transform into a best in class network utility service provider. Leveraging this work in PC3, Gas Networks Ireland has developed its Asset Management System (AMS), to embed a strong asset management capability and focus throughout the company. In 2015 Gas Networks Ireland became the first utility in Ireland to achieve certification of its AMS to the ISO55001 standard.

1.3 Key challenges for PC4

Gas Networks Ireland delivered on its key commitments for PC3. Going into PC4, the key challenges for Gas Networks Ireland are:

- ensuring that gas fulfils its critical role in supporting energy policy;
- managing an ageing asset base; and
- ensuring competitive gas transportation tariffs for customers now and into the future.

Ensuring that gas fulfils its critical role in supporting energy policy

The Irish Government published its White Paper on energy policy, "Ireland's Transition to a Low Carbon Energy Future", in 2015. Its stated policy objective is to guide the transition to a low carbon energy system that provides secure supplies of competitive and affordable energy to Irish citizens and businesses.

Although the White Paper acknowledges that there will continue to be a need for gas to meet Ireland's energy needs well into this century, it equally acknowledges that a transformation of Ireland's energy systems is required to meet climate policy objectives and that Ireland will gradually reduce its dependence on fossil fuels. A key challenge for Gas

Networks Ireland over this and subsequent price controls will be to adapt to, and support, the transformation of Ireland's energy systems.

In the White Paper the Government sets out the role of natural gas in assisting the transition to a low carbon future and, in particular, highlights the role of natural gas in the following areas:

- **Shift from more carbon-intensive fuels to lower-carbon fuels like natural gas**: Natural gas is the cleanest fossil fuel with 40% less CO_2 emissions than coal and 24% less than oil. Conversion to gas in power generation (e.g. peat plants) and in heating (e.g. gas conversions in mature housing estates) can significantly reduce CO_2 emissions in Ireland.

- **Roll out of CNG fuelling points**: CNG vehicles offer multiple benefits over conventional diesel vehicles, including significant reductions in CO_2 and particulate emissions. The White Paper references the Alternative Fuels Infrastructure Directive which requires the provision of a sufficient number of publicly accessible CNG refuelling points to be built.

- **Development of indigenous renewable gas**: Renewable gas is a versatile and sustainable energy source that can make a significant contribution to Ireland's renewable energy and carbon reduction targets. Renewable gas technology is mature and widely used in a number of European countries.

Each of these measures will see Gas Networks Ireland continue to adapt its network and leverage its assets and expertise to deliver a low carbon future.

The White Paper notes that Carbon Capture and Storage is recognised as a potential bridging technology to support the transition to a low carbon economy by capturing CO_2 from electricity generating power stations and preventing it from entering the atmosphere. This may facilitate the continued operation of gas fired generation into the future.

In addition to the measures identified by the White Paper, Gas Networks Ireland recognises that, over this and subsequent price control periods, the gas network will continue to be called upon to support and enable an ever increasing penetration of renewables in Ireland's electricity system. Natural gas is an integral part of the national electricity system as it provides fuel to gas-fired power generation plants, which by end of September 2016 had generated over 52% of Ireland's electricity year to date. Moreover, these gas-fired plants are essential to provide flexibility to react to, and mitigate the challenge posed by the intermittency of renewable energy sources. Gas plants respond at scale, faster, and at lower CO_2 output, than either coal fired plants or oil fired peaking plants. This makes them the optimal plant to support increasing levels of renewable penetration. This dependence on gas was most evident during the prolonged cold weather spells in 2010 when record sub-zero temperatures were recorded combined with record gas and electricity demands

A key challenge for Gas Networks Ireland will be to continue to ensure the flexibility and reliability of its system to allow it to underpin the ongoing transformation and decarbonisation of the electricity system.

More generally, natural gas plays a vital role in Ireland's energy mix and economic progress. It currently represents 27% of Ireland's primary energy supply. Gas supplies are of key strategic importance to the Irish economy given not only the prevalence of gas fired generators in the electricity market, but also the number of residential customers who rely on gas heating and businesses who need reliable gas supplies.[5] The critical importance of gas to the Irish economy heightens the need for a secure and reliable gas supply and for a considered and measured transition to a low carbon economy.

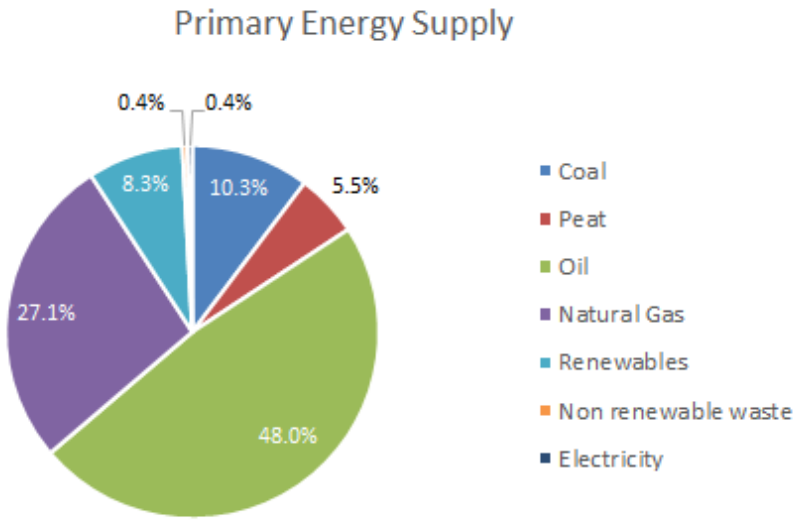

Figure 2: Ireland's Primary Energy Supply for 2015[6]

It is imperative that Gas Networks Ireland is given adequate allowances to ensure that natural gas fulfils the role envisaged in the White Paper. Otherwise, Ireland will miss an opportunity to decarbonise at least cost.

Managing an ageing asset base

Gas Networks Ireland commenced development of the natural gas infrastructure in 1976. Over the following 40 years, Gas Networks Ireland expanded the transmission and distribution networks across Ireland and built interconnection with Great Britain. During this time, network expansion has not been completed at a constant rate, but in a series of investment tranches. The 1990s and 2000s, in particular, saw periods of large scale infrastructure additions to the network.

[5] This was recognised by CER in its CER Strategic Plan 2014-2018: https://www.cer.ie/docs/000049/CER14751%20CER%20Strategy%20Plan%20v11.pdf

[6] SEAI, Ireland's Energy Balance 2015: http://www.seai.ie/Publications/Statistics_Publications/Energy_Balance/2015-Energy-Balance-PDF.pdf

The primary components of the network, buried high pressure steel pipework for transmission and polyethylene pipelines in distribution, have long design lives. However, the ancillary components and subcomponents of the pipelines, Above Ground Installations (AGIs), District Regulator Installations (DRIs) and at meter points have considerably shorter design lives. Many of these components have already reached, or are approaching, their end of design life and require refurbishment or replacement to ensure the continued operation of the network in a safe and secure manner.

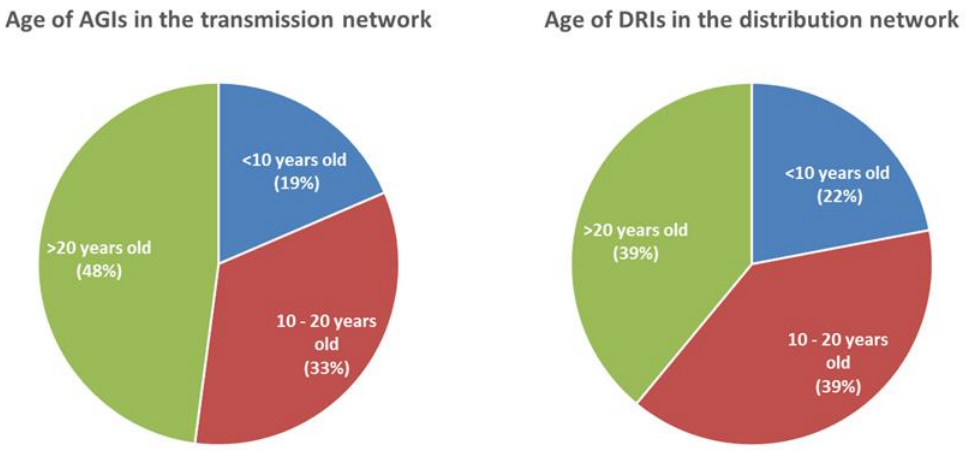

Figure 3: Age of AGIs and DRIs in the transmission and distribution network

In addition, certain components on the network are approaching the end of their operational life, without having reached their expected design life. This is due to harsh environmental conditions and onerous usage profiles (driven by factors including the variability of wind generation) to meet changing demand requirements. Early replacement of such components, particularly on the compressor fleet, has been, and will be, necessary to ensure the continued reliable operation of the network.

Gas Networks Ireland has assessed the long term asset renewal investment requirement of the network. The objective of this work is to determine a long term (25 year) expenditure profile based on the projected lifecycle of the assets. The analysis completed to date, has highlighted that the level of replacement expenditure must increase in PC4 and PC5 prior to levelling off towards the end of the 2020s.

Increased intervention is required in PC4 to manage ageing assets. Any deferral of asset replacement and refurbishment negatively impacts on network safety and reliability and further increases the burden on future periods.

Ensuring competitive tariffs for customers now and into the future

Tariff competitiveness is a critical challenge for Gas Networks Ireland over this and subsequent price controls. While increased economic growth is forecast over the PC4

period, Gas Networks Ireland recognises that customers will continue to face a significant economic burden. Energy poverty affects more than 460,000 households in Ireland.[7]

In relation to industry, energy costs remain a significant factor in restoring international competitiveness, securing inward investment and supporting the economy. Together with security and sustainability, competitive energy pricing is a key facilitator of economic development.

Gas prices in Ireland currently remain competitive when compared with other European countries and with alternative fuels. As shown in the figure below, Irish household and industrial natural gas prices have remained consistently lower than the average natural gas prices in the 28 European Union countries from 2008 to 2015. At 5.00 c/kWh, natural gas compares favourably with 18.06 c/kWh for electricity, 8.33 c/kWh for LPG, 8.13 c/kWh for Wood and 7.56 c/kWh for Oil.[8] The challenge for Gas Networks Ireland is to ensure, insofar as possible through its impacts on tariffs, that this level of competitiveness is maintained throughout this and future price controls.

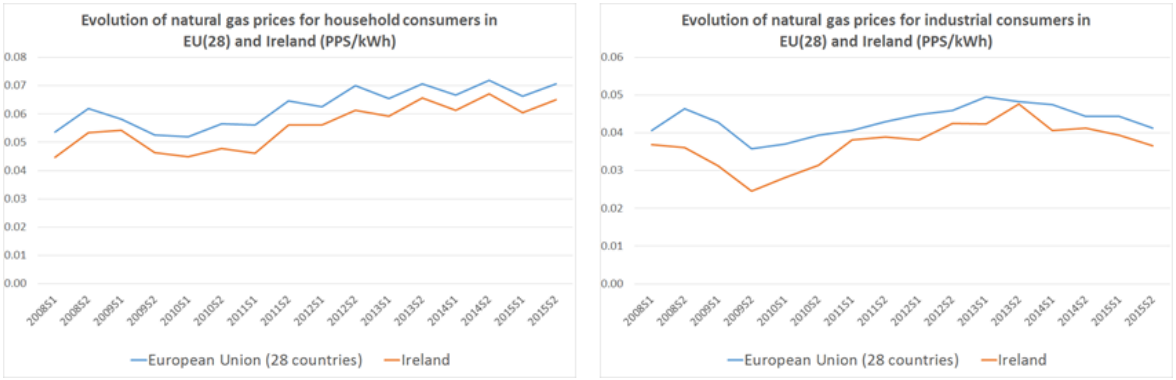

Figure 4: Natural gas prices in EU (28) and Ireland for household and industrial consumers, 2008 – 2015[9]

In particular, Gas Networks Ireland recognises that over the longer term, if action is not taken to maintain demand on the network, customers could face a significant long term risk of increasing tariffs in Ireland. Longer term independent modelling suggests that gas demand could reduce by 40% - 60% or more by 2050 due to climate change policies, EU directives, technological developments in areas such as energy storage, increased renewables, greater electrification and energy efficiency dynamics.[10] Given that tariffs in Ireland impact both the delivered cost of gas and the wholesale price of the commodity, it is critical that such a drop off in demand be mitigated, by increasing demand in other sectors, where there are real economic and environmental benefits to doing so. This will

[7] Source: Source: http://www.dccae.gov.ie/energy/SiteCollectionDocuments/Energy-Efficiency/An%20Objective%20Analysis%20of%20Energy%20Poverty%20in%20Ireland.pdf

[8] SEAI October 2016. Note that prices are for medium sized business users and based on the average seasonal efficiency of each fuel type (http://www.seai.ie/Publications/Statistics_Publications/Fuel_Cost_Comparison/Commercial_Fuel_Cost_Comparison.pdf)

[9] Source: Eurostat Natural Gas Price Statics available from http://ec.europa.eu/eurostat

[10] Implications for Ireland – Moving Towards a Low Carbon Energy Roadmap, ESRI – UCC Energy Research Workshop 2014.

not only preserve the competitiveness of gas for customers but also the broader role of gas in the decarbonisation of Ireland's energy system.

In order to ensure that the cost of gas delivered to customers remains as competitive as possible, over this and future price controls; Gas Networks Ireland must:

- maximise utilisation of the gas network by seeking to grow demand; and
- drive cost efficiencies to achieve best value for customers.

Gas Networks Ireland will also continue to facilitate competition in the wholesale and retail gas markets through the implementation of market rules. Gas Networks Ireland will furthermore continue to empower customers to manage their energy costs, by the facilitation of supplier switching[11] and through the installation of pre-payment metering.[12]

Providing the benefits of competitive natural gas to new customers is a key priority of Gas Networks Ireland in PC4.

Building on the commitments delivered in PC3, and the challenges that have been identified, Gas Networks Ireland has set key PC4 objectives that must be delivered to ensure the continued safe, reliable and secure supply of natural gas at a competitive cost to all customers.

[11] Five natural gas suppliers operate in Ireland and the rate of switching suppliers is high. To date, 50% of customers have switched suppliers for cheaper gas bills.

[12] Gas Networks Ireland has installed more than 97,000 Pay As You Go (PAYG) meters which provide customers with direct control over their energy consumption and costs.

2 PC4 key objectives

Gas Networks Ireland must respond to the challenges posed by the evolving role of gas and an ageing network while ensuring competitiveness.

As outlined in Section 1, Gas Networks Ireland faces serious challenges in PC4. The role of gas is changing to meet national policy demands. The asset base continues to age, requiring increased intervention to manage risk. Competitiveness, now and into the future, remains a key issue. Beyond these challenges, the fundamental principles remain that safety is Gas Networks Ireland's number one priority and that gas security of supply must be protected given its importance in the national energy system. It is in this context that Gas Networks Ireland has identified its key objectives for the PC4 price control period.

In PC4 Gas Networks Ireland must:

- operate to the highest safety standard;
- ensure reliability and security of supply;
- ensure competitive tariffs and support Ireland's least cost transformation to a low carbon economy; and
- respond to changing customer service demands.

2.1 Operate to the highest safety standard

The company is committed to maintaining, and further developing, the systems, processes and resources necessary to ensure a continuous high level of safety performance and a culture of safety improvement. Gas Networks Ireland has a comprehensive Safety Management System in place, which ensures that risks posed from its activities and assets are managed to a level that is "as low as reasonably practicable" (ALARP).

Gas Networks Ireland operates in accordance with its safety cases, which follow the Safety Case Guidelines issued by the CER in Ireland and by the UK Health and Safety Executive (HSEUK) in Scotland. Gas Networks Ireland manages the network in accordance with safety frameworks operated in the two jurisdictions. In many cases maintenance and capital intervention proposals for PC4, which have been developed using the AMS, have also been informed by the inspection and audit regime operated by the two safety regulators. The focus of the safety cases are therefore on the safe management of the network and the response to emergencies, demonstrating the arrangements that are in place for:

- the safe control and operation of the transmission and distribution systems;
- the management of the life cycle of assets including:
    - design, construction, commissioning;
    - maintenance and repair;
    - reinforcement and renewal; and
    - decommissioning and abandonment;
- ensuring that staff meet the required standards of competence and qualification;

- emergency preparedness, emergency response and the activation of the National Gas Emergency Manager if required;
- ensuring that gas transported in the network meets required standards for gas composition and quality;
- hazard assessment and mitigation of the gas safety risks associated with the transportation of gas;
- compliance with relevant standards and codes of practice;
- measuring the performance of its Asset Safety Management System against Safety Performance Indicators (SPIs); and
- cooperation with third parties.

Gas Networks Ireland also operates in accordance with CER and HSEUK published documents on safety matters including the recently released ALARP Policy Document CER/16/106.

In PC4, Gas Networks Ireland will undertake a number of initiatives to ensure that it continues to achieve the highest standards of safety. In addition to the continuation of current safety initiatives, this will include:

- implementation of the 'Work Safe Home Safe' programme;
- enhancement of the technical competency framework; and
- investment in technology to provide improved field staff access to relevant safety information.

Through adherence to its Safety Cases and the above initiatives, Gas Networks Ireland will deliver a safe service to customers and strive to achieve its goal of zero harm.

2.2 Ensure reliability and security of supply

Reliable and secure gas supplies are a key strategic requirement for Ireland given the interdependence with the electricity system and the number of residential and industrial/commercial customers who depend on gas for their energy needs. A 2010 ESRI study[13] estimated that the costs to the economy of losing gas supplies could be as high as €1 billion per day.

More than 40% of the network is now more than 20 years old. The age of the network has a direct impact on the level of intervention required to manage its risk profile. In PC4 Gas Networks Ireland must increase maintenance and capital investment to ensure that a reliable and secure supply of gas is available to all customers.

The Gas Networks Ireland AMS includes documented asset policies and Functional Specifications and Requirements (FSR) for all asset groupings. The policies and specifications are aligned with relevant national and international standards. Full implementation of the FSRs assists the development of maintenance and

[13] https://www.esri.ie/pubs/WP397.pdf

replacement/refurbishment plans which ensure that risks on the network are maintained at levels which are ALARP.

Gas Networks Ireland's AMS is similar to those operated by other leading utility companies worldwide. It prescribes a pre-emptive maintenance programme, a refurbishment regime, and a replacement cycle for assets prior to the occurrence of failure events. In 2015, Gas Networks Ireland was the first Irish utility to have its AMS certified in accordance with ISO55001, the industry standard for asset management systems. This demonstrates that Gas Networks Ireland is delivering a best practice approach in its asset management processes.

The maintenance and capital interventions proposed by Gas Networks Ireland, represent the optimal approach to maintain risks at an ALARP level. Gas Networks Ireland has applied asset management principles to the work programme, assessing the risk reduction against the cost of intervention. Where it is deemed possible to defer an investment, while maintaining the risk on the network at an acceptable level, this option has been chosen.

Delivery of the proposed capital programme together with the planned maintenance activities will ensure a secure and reliable gas network.

2.3 Ensure tariffs are competitive and support Ireland's least cost transformation to a low carbon economy

The most effective way of ensuring competitive gas tariffs for customers is to maximise utilisation of the network and increase demand. Gas can play a major role in the efficient transformation of Ireland to a low carbon economy. There is a compelling case[14] for the long-term utilisation of the gas network to decarbonise much of Ireland's electricity generation, industrial, heating and transport sectors by displacing more carbon intensive fossil fuels. Over PC4, the objectives of competitiveness and decarbonisation will be achieved by increased gas fired electricity generation, additional new connections and expanding into new sectors.

Through the continuation of its growth strategy commenced in PC3, Gas Networks Ireland intends to deliver over 100,000 additional domestic and commercial customers over the period of PC4. Achieving this target will place downward pressure on network tariffs to the benefit of all gas customers as well as having a significant environmental benefit from switching customers from oil or coal to natural gas.

CNG can deliver benefits in terms of cheaper fuel for transportation, lower air and noise pollution and, with more gas flowing through the network, will place downward pressure on tariffs for all natural gas users. Following engagement with stakeholders, Gas Networks Ireland has identified 25 strategic locations for CNG refuelling stations around the country. Construction of these stations is essential to the development of a market for natural gas

[14] For example see KPMG report "2050 Energy Scenarios - The UK Gas Networks role in a 2050 whole energy system."

as a transport fuel and to meeting the requirements of the Alternative Fuels Infrastructure Directive.

Renewable gas has a role to play in retaining and attracting foreign direct investment to Ireland. Many large companies have set targets for the use of renewable energy. Renewable gas provides a solution for reaching those targets with minimal cost of new infrastructure or risk to supply, as renewable gas is transported through the existing gas network. In addition, renewable gas can be part of the solution for national waste management through the conversion of waste to gas. Over PC4 Gas Networks Ireland plans to facilitate the development and connection of six renewable gas production and injection facilities around the country as a necessary stimulus to this market.

The table below sets out the total connection targets for PC4.

Connections	2017/18	2018/19	2019/20	2020/21	2021/22	Total
New Housing	10,078	10,681	10,116	9,943	9,569	50,387
Mature Housing	8,790	9,531	9,190	9,356	9,377	46,244
I&C	1,463	1,500	1,314	1,251	1,250	6,778
CNG stations	6	5	3	5	6	25
Renewable gas facilities	1	1	1	2	1	6

Table 1: Forecast connections in PC4

Increased utilisation of the network provides clear benefits to gas customers in terms of reduced tariffs. Gas Networks Ireland aims to increase gas utilisation and maximise customer density on the network which will also lower carbon emissions in Ireland.

2.4 Respond to changing customer service demands

In PC4, the number of customer interactions will increase substantially given the forecast connections and increased planned works at customer homes and businesses. Even with this increased engagement level, Gas Networks Ireland will continue to meet its customer charter targets.

Customer research undertaken by Gas Networks Ireland is consistent with international research[15] which shows that a more digital and personalised experience is increasingly important to customers. To address this the company will:

- increase the use of technology such as apps, web chat and YouTube videos that will allow ease of contact by and support to the customer;
- extend the use of social media as a channel for dealing with customers' queries, customer connections and knowledge sharing (e.g. twitter, Facebook, Boards.ie, links to website, severe cold weather warning etc.); and

[15] https://www.accenture.com/us-en/insight-new-energy-consumer-thriving-new-retail-ecosystem

- drive ongoing improvements by liaising with customers and staff to identify potential issues to improve the customer experience.

Customer satisfaction is a known and understood measure of how products/services supplied by a company meet or surpass customer expectation. Customer satisfaction ratings focus employees on the importance of fulfilling customer expectations and can warn of problems that need to be addressed. Measuring customer satisfaction will enable Gas Networks Ireland to focus on delivering an excellent customer experience.

Gas Networks Ireland has an extensive customer service measurement programme in place and will continue to develop and enhance its systems throughout PC4. This will ensure Gas Networks Ireland continues to meet and exceed ever increasing customer expectations. KPIs have been put in place to measure customer satisfaction and the key customer metrics that Gas Networks Ireland aims to achieve over the PC4 period. These are outlined in the table below.

Metric	Description	Target
Customer Satisfaction (with Gas Networks Ireland operations)	Customers are asked: 'How satisfied were you with your experience with Gas Networks Ireland?' Customers who choose a score of 7 or above on a scale of 1-10 are considered satisfied. The target refers to the percentage of customers who give a satisfaction score of 7 or above.	80%
Customer Satisfaction (with Gas Networks Ireland Contact Centre)	Customers are asked: 'How satisfied were you with your experience with Gas Networks Ireland contact centre?' Customers who choose a score of 7 or above on a scale of 1-10 are considered satisfied. The target refers to the percentage of customers who give a satisfaction score of 7 or above.	80%
Call Response	Percentage of call answered within 20 seconds of the call connecting.	80%
Abandon Rate	Percentage of calls abandoned by caller after 10 seconds.	7%
Complaints Resolution	Percentage of complaints resolved in less than 10 working days and less than 30 working days.	85%

Table 2: Key customer metrics

Over the PC4 period, Gas Networks Ireland will modernise its customer interface and maintain high levels of customer satisfaction.

There is a serious challenge facing the role, reliability and competitiveness of the national gas network in PC4. Gas Networks Ireland is committed to meeting this challenge and to meeting its customers' and stakeholders' needs, with the continued safe and efficient provision of this critical national service. Failure to provide the necessary investment will impact the reliability of the network, impede the delivery of energy policy and put upward pressure on gas tariffs.

3 Implications for expenditure, investment and revenue

The following section outlines the operating costs, capital investment, return on investment and revenue requirement in PC4 to deliver on the objectives Gas Networks Ireland has set out in Section 2.

3.1 Operating expenditure

Gas Networks Ireland has an operating expenditure requirement for the PC4 period of €898m. The overall requirement and the expected outturn for PC3 is set out in the table below.

Total Operating Costs	PC3 €m	PC4 €m
Distribution		
Controllable costs	**305**	**380**
Pass through	**105**	**93**
Sub-Total	**410**	**473**
Transmission		
Controllable costs	**246**	**332**
Pass through	**81**	**92**
Sub-Total	**327**	**424**
Total Operating costs	**736**	**898**

Table 3: PC3 & PC4 Operating expenditure

The increase in controllable operating expenditure relative to PC3 is driven by the greater scope of works to be delivered in PC4. Further details of the main drivers are outlined below.

Maintenance costs

Timely maintenance of assets is essential to ensuring the reliability of the network and to optimising whole life costs. In PC4, maintenance costs will increase by c. 33% compared to PC3. Gas Networks Ireland must continue the current maintenance programmes on a growing asset base, as well as delivering maintenance programmes for new asset classes. Additional survey and maintenance work is also required to address issues of asset degradation.

Over the course of PC3, the level of compliance and best-practice driven maintenance of the existing asset base has increased. This higher level of maintenance will continue to be required over PC4, and in relation to a larger asset base. The total number of connections is projected to rise by c.14% by the end of PC4. In addition to direct costs, such as meter

reading and customer contacts, associated with a larger customer base, Gas Networks Ireland must expand its response capability in new geographic areas. Increased construction activity from economic growth will also lead to an increase in siteworks (e.g. to alter gas installations) and response activities (e.g. to react to damage caused to gas installations).

Although not a large cost driver, it is noted that the maintenance of new asset types such as CNG fuelling stations and Renewable Gas injection facilities will also drive new types of maintenance programmes.

In respect of ageing or degraded assets, Gas Networks Ireland will carry out a number of survey activities in order to inform risk-based refurbishment and maintenance programmes. A survey of the population of domestic services is scheduled to commence in 2017/18.

Additional planned maintenance activities have also been identified including:

- securing access: Gas Networks Ireland proposes to commence a new programme to address safety concerns at sites where Gas Networks Ireland has not been able to gain access for a number of years;
- Midleton compressor station: Increased levels of planned maintenance and repairs/unplanned works will be required to keep the facility fully operational; and
- meter inspection to identify mechanical integrity and metrology issues.

Resourcing

Due to the ageing asset base and projected increase in customer numbers, the required PC4 work programme is substantially larger than the programme delivered in PC3. Gas Networks Ireland has identified key gaps and resource shortages in critical technical and engineering roles. To address this, Gas Networks Ireland has developed a resource strategy to ensure that it is appropriately resourced to 2022.

Gas Networks Ireland forecasts a net increase in headcount of c.70 people over 2015/16 levels with the majority joining in 2016/17 and 2017/18 to facilitate the required ramp up in the programme of work. These people will be recruited to fill 35 technical roles in Asset Operations, Asset Management and HSQE. The technical roles include design, work scheduling and management, C&I, safety audits and construction/services engineering. Gas Networks Ireland will also continue its apprenticeship and graduate trainee programmes (c. 25 roles spread over the period). The remaining 10 roles are in support services to help the business deliver its plan efficiently.

Insurance

Based on current broker advice, Gas Networks Ireland projects that insurance rates and premiums in the market will increase between 30-35% over the next five years. Due to increases in work programmes, Gas Networks Ireland is already experiencing an increase in public liability claims. It is expected that these will continue, which will increase costs over PC4.

3.2 Capital expenditure

Gas Networks Ireland has a capital expenditure requirement of €799m for the PC4 period. The increase is a direct result of the ageing asset profile and the forecast growth in connections. The forecast capital expenditure for PC4 and the expected outturn for PC3 is set out in the table below.

Capex	PC3 €m	PC4 €m
Transmission		
Refurbishment/Replacement/Upgrades	**112.5**	**183.7**
Growth and network development	**34.4**	**40.4**
Twining[16]	**49.8**	**8.6**
IT Systems and facilities	**25.3**	**37.6**
Sub Total Transmission	**222.0**	**270.4**
Distribution		
Refurbishment/Replacement/Upgrades	**118.2**	**230.5**
Growth and network development	**141.0**	**266.6**
IT Systems and facilities	**22.0**	**31.7**
Sub Total Distribution	**281.1**	**528.7**
Total	**503.1**	**799.1**

Table 4: PC3 and PC4 Capital Expenditure

Refurbishment/Replacement/Upgrade programme

To ensure the safety, security and reliability of its ageing network Gas Networks Ireland must deliver a refurbishment/replacement/upgrade programme of €414m.

Planned refurbishments are based on a pre-emptive programme in accordance with the AMS. Replacement of the assets is scheduled to take place at the end of their design life but prior to them failing. This approach delivers the lowest whole life asset cost.

[16] Net of grant

Over the price control period, a large number of refurbishment programmes is planned across each of the asset groups which address asset ageing, degradation issues and obsolescence. Programmes include individual safety critical measures as well as high volume activities. These include:

- replacing the lube oil coolers and post compression gas coolers at Brighouse Bay, which have been aggressively corroded from exposure to the sea air;
- refurbishment and upgrades of compressor station equipment to accommodate high cycling and low flow rates;
- upgrading internal steel risers in multiple occupancy buildings which are located in inaccessible building shafts;
- removal of 12 isolation joints at high and medium risk locations from transmission pipelines;
- relocating c. 9,000 domestic meters which have been identified to be located in unsafe (and/or non-compliant) positions in customer properties;
- installation of c. 9,000 excess flow valves on 4 bar domestic services to limit the propagation of gas leaks from third party damage or asset failure; and
- replacing c. 4,400 industrial and commercial meters, an increase of 42%;and
- replacing c. 124,000 domestic meters, an increase of 10%.

Gas Networks Ireland operates a risk based safety management system in line with CER's Gas Safety Framework. Recognising that failure of assets can have severe consequences for the safety of persons and property, Gas Networks Ireland considers that the expenditure proposed is the optimal level of intervention required to maintain risk at levels that are ALARP and to comply with relevant standards. Any deferral of asset replacement and refurbishment negatively impacts on network safety and reliability, increases delivery risk and increases the burden on customers in future price control periods.

IT System and facilites

Gas Networks Ireland IT systems are essential to the day to day management of the gas network and to the operation of the wholesale and retail gas markets in Ireland.

Capital expenditure of €49m is necessary to ensure that Gas Networks Ireland maintains, and keeps up to date, the existing IT systems and is compliant with mandatory regulatory driven requirements (e.g. upgrades to the Gas Transportation Management System). If this investment is not undertaken, Gas Networks Ireland critical IT systems will move out of support, resulting in a potential degradation in performance and stability, potential increased security risk and an increased operational risk to the business.

Gas Networks Ireland facilities are suffering from age related degradation and require investment in PC4 to undertake necessary refurbishment and ensure compliance with changing statutory building standards and regulations.

3.3 Weighted Average Cost of Capital (WACC)

Gas Networks Ireland commissioned Frontier Economics to carry out an independent study to estimate the WACC of Gas Networks Ireland's business for PC4. In line with regulatory precedent, the approach is based on the Capital Asset Pricing Model. Frontier has maintained consistency with regulatory best practice and recent regulatory precedent in Ireland and the UK. Frontier has given particular weight to the CER's recent decision in relation to ESBN, given the similarities between Gas Networks Ireland and ESBN and given the limited movement in key WACC parameters since the ESBN decision.

The table below outlines the proposed range and recommended point estimate for the components of the WACC.

Parameter	Low Range	High Range	Point Estimate
Gearing	**55%**	**55%**	**55%**
Risk-free rate	**1.90%**	**2.00%**	**1.90%**
Debt premium	**0.96%**	**1.14%**	**1.00%**
Cost of debt	**2.86%**	**3.14%**	**2.90%**
Equity risk premium	**4.60%**	**4.75%**	**4.75%**
Asset beta	**0.43**	**0.45**	**0.44**
Equity beta	**0.96**	**1.00**	**0.98**
Cost of equity (post-tax)	**6.30%**	**6.75%**	**6.54%**
Corporate tax	**12.5%**	**12.5%**	**12.5%**
Cost of equity (pre-tax)	**7.19%**	**7.71%**	**7.48%**
WACC pre-tax	**4.81%**	**5.20%**	**4.96%**

Source: Frontier Economics' estimates

Table 5: Overview of WACC parameters

It is important to note that market uncertainty is very high as a result of Brexit, which could lead to severe volatility in the financial market conditions in the short and long term. As a result, Gas Networks Ireland believes that it is important that the CER is conservative in its approach to setting WACC.

Gas Networks Ireland recommends a point estimate of 4.96%, as this is supported by market evidence and is in line with recent decisions by CER.

3.4 PC4 Revenue requirement

Transmission revenue requirement

The forecast revenue requirement for the PC4 period for the transmission business is €1.0 billion and equates to an average revenue requirement of €200m for each year. The components of the revenue are outlined in the table below.

2021/22 €m	2017/18 €m	2018/19 €m	2019/20 €m	2020/21 €m	2021/22 €m	Total €m
Return	**68.6**	**70.1**	**69.9**	**69.3**	**68.6**	**346.6**
Depreciation	**57.1**	**60.3**	**63.1**	**66.4**	**68.9**	**315.6**
Opex Allowance	**81.8**	**87.9**	**88.9**	**82.9**	**82.5**	**424.0**
Clawback/K-factor/Profiling	**-7.9**	**-16.4**	**-17.2**	**-2.7**	**-0.6**	**-44.9**
Total	**199.6**	**201.8**	**204.6**	**215.9**	**219.4**	**1,041.3**

Table 6: Forecast transmission revenue

Forecast depreciation for both Transmission and Distribution includes some amendments to the existing PC3 depreciation framework which are subject to agreement with the CER. All other asset depreciation rates are as per the existing PC3 framework but may require further consideration.

Distribution revenue requirement

The forecast revenue requirement for the PC4 period for the distribution business is €1.1billion and equates to an average revenue requirement of €220m for each year. The components of the revenue are outlined in the table below.

Distribution Revenue	2017/18 €m	2018/19 €m	2019/20 €m	2020/21 €m	2021/22 €m	Total €m
Return	**68.6**	**71.1**	**73.5**	**76.1**	**78.5**	**367.8**
Depreciation	**49.8**	**53.3**	**56.6**	**60.8**	**65.0**	**285.5**
Opex	**94.0**	**94.5**	**95.1**	**95.0**	**94.9**	**473.5**
Clawback/K-factor/Profiling	**-7.9**	**-5.7**	**-5.3**	**-6.0**	**-7.4**	**-32.3**
Total	**204.6**	**213.1**	**219.9**	**225.9**	**231.0**	**1,094.5**

Table 7: Forecast Distribution Revenue

Tariff impact

Gas Networks Ireland recognises the critical importance of tariff competitiveness for customers. In PC4, a key focus will be placed on maximising utilisation of the network by increasing demand and thereby keeping tariffs competitive. Demand is forecast to increase

by 9%[17] by 2021/22. Gas Networks Ireland will continue to drive efficiencies in its capital investment and operating activities to achieve best value for customers.

Gas Networks Ireland forecasts broadly flat tariffs with a c0.4 % increase in transmission tariffs[18] and a c. 2.3% increase in distribution tariffs on average when compared to PC3.

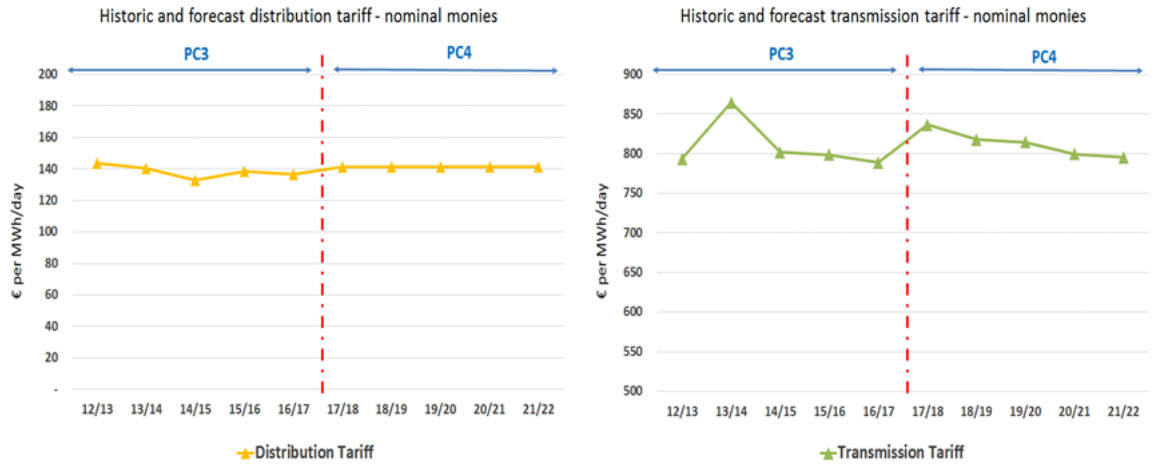

Figure 5: Historic and forecast distribution and transmission tariffs (nominal monies)

[17] This is based on Transmission exit commodity and capacity

[18] For illustrative purposes the transmission tariff shown is the Interconnector Entry Tariff and Transmission Exit tariff combined.

4 Efficiency and value for money

Gas Networks Ireland will deliver measures to maintain the competitiveness of its costs and operate efficiently.

Gas Networks Ireland recognises that efficiency remains critical to its value proposition over PC4. Benchmarking undertaken to assess Gas Networks Ireland's relative efficiency demonstrates that in PC3 Gas Networks Ireland was broadly efficient compared to peers. Gas Networks Ireland will continue to drive efficiency in PC4.

4.1 Relative efficiency compared to peers

A core part of ensuring ongoing efficiency is to benchmark against external peers. Gas Networks Ireland carries out benchmarking to ensure that it is efficient and delivering value for money for customers.

Distribution Operations Benchmarking: Gas Networks Ireland engaged Frontier Economics to benchmark its costs relative to Gas Distribution Networks (GDNs) in Great Britain. Frontier Economics concluded that Gas Networks Ireland was efficient compared to the GDNs. Distribution operating expenditure in 2015 was found to be approximately 6%, or €3.8 million, below the estimated efficient amount.

Transmission Operations Benchmarking: Benchmarking of transmission companies is particularly difficult due to the differences (geographical and size) between companies, and the level of participation in benchmarking studies. Gas Networks Ireland participates in the Gas Transmission Benchmarking Initiative (GTBI) to gain insight into the performance of other TSOs. However it should be recognised that the GTBI is of limited value given the difficulties, some of which are highlighted below, in making meaningful comparisons between participant entities.

While Gas Networks Ireland is above the median costs in the GTBI study, the report points out that this is as a result of Ireland's reliance on the two interconnector pipelines with Great Britain. The associated compression facilities require Gas Networks Ireland to meet far higher security of supply and reliability standards than any of the comparator utilities such that no direct comparator exists. As such, while the study demonstrates that Gas Networks Ireland has performed very strongly in terms of ensuring the reliability of the transmission system and compares favourably to other participant entities, the value of the comparisons generated by this report is somewhat questionable.

Support Services Benchmarking: In November 2015, Ervia commissioned EY to conduct a performance review and benchmarking exercise to compare performance of support functions across the Ervia Group. The benchmark results show that Ervia's support functions are efficient, with performance of most functions in line with or better than industry benchmarks.

4.2 Measures to drive efficiencies in operating expenditure

The two key components of Gas Networks Ireland's controllable operating expenditure are payroll (32%) and costs associated with outsourced delivery of maintenance activities (33%). Gas Networks Ireland has measures in place to ensure these costs are efficient.

Pay structure: Gas Networks Ireland has implemented a new pay model. This pay model will continue to deliver savings to Gas Networks Ireland such as:

- externally benchmarked pay ranges which link pay ranges to the market;
- elimination of automatic increments;
- reduction in overtime, allowances and expenses; and
- an element of "pay at risk", linking remuneration to performance.

An assessment of the pay model was conducted by Aon Hewitt in 2015[19]. This concluded that the pay model at Ervia, including Gas Networks Ireland, is consistent with best practice in the marketplace and that pay levels are lower than typical market levels in most cases.

Outsourced Contractor Model: Historically, Gas Networks Ireland relied on multiple providers to carry out works on the network. Following a review of its contracting model, Gas Networks Ireland determined that the most efficient model was the long term appointment of a single main contractor. Following a competitive tender process the National Services and Works Contract (NSWC) was awarded to Balfour Beatty CLG (BBCLG) in 2012 and will run until 2021. The new partnership contract delivers ongoing efficiencies including:

- rates which were on average 5% lower than previous contracts;
- rates freeze for the first two years of the contract; and
- non-aggressive pursuance of claims by the contractor, saving unnecessary costs.

The strong partnership approach has led to better quality of outputs. Overall the single contract model is delivering annual savings of c. €4.1m per annum which have been incorporated into the projections.

[19] The report is available at www.ervia.ie/media/ervia_pay_model_review_report_final.pdf

Efficient Procurement: Gas Networks Ireland continually seeks to achieve savings with its suppliers. Its procurement process has been designed to achieve efficiencies including:

- use of framework contracts and 'mini tenders' to ensure the best available market rates from a panel of competent resources are achieved;
- consolidation of the supplier base leading to reduced administration; and
- Best and Final Offer (BAFO) process to ensure the supply base offers Gas Networks Ireland the best possible value proposition.

Gas Networks Ireland strives to achieve efficiency in its operations and on top of efficiencies already achieved has embedded a 0.5% annual efficiency factor in its PC4 proposals.

4.3 Measures to drive efficiencies and governance in capital expenditure

The Gas Networks Ireland AMS incorporates risk-based decision making, considering the whole life cost of assets. Looking to the PC4 period, Gas Networks Ireland identified an unconstrained portfolio of c. €556m capital interventions to address all asset obsolescence, compliance and degradation issues. Gas Networks Ireland risk assessed this portfolio in order to prioritise and optimise the most critical investment resulting in a deferral of c. €142m of investment from the PC4 period.

Over PC3, Gas Networks Ireland has significantly strengthened its governance procedures around capital expenditure. Gas Networks Ireland's rigorous governance procedures ensure that, at each stage of the project lifecycle, the expenditure is required, appropriate, efficient and properly recorded. The core processes are:

- **investment governance**. A cross-functional stage review process is in place which includes five review / approval points in the project life cycle to ensure that:
    - effective governance is operated in the identification, development, and selection of appropriate capital investments;
    - a rigorous design process is undertaken to identify the most efficient solutions (including the optimal routes for diversion works);
    - projects / programmes are delivered to time and budget or, where relevant, with appropriate governance of programme variations; and
    - learnings are captured and applied in subsequent projects to secure continuous improvement.
- **contract approval**: A progressive approval of contracts from procurement strategy to contract award and performance review ensures value for money is achieved in the award and performance of all contracts; and

- **programme management** including:
    - efficient phasing and programming of works;
    - planning, procuring and scheduling works from different programmes to take place simultaneously at a single site, thereby reducing tendering, contractor mobilisation and supervision costs;
    - phasing programmes of work at geographically clustered locations to reduce contractor mobilisation, travel and supervision costs; and
    - active management of on-site costs, including contractor variation claims and Local Authority charges.

Collectively these processes ensure that appropriate governance is in place, only necessary and efficient expenditure is incurred and that all expenditure is aligned to the appropriate allowance.

Conclusion

Over PC3, Gas Networks Ireland achieved each of the objectives it committed to at the outset of the period, while at the same time prioritising and delivering only necessary and cost effective investment.

In PC4, Gas Networks Ireland must meet the enduring challenge of providing an efficient, reliable and secure gas network in order to protect the national energy system and wider economy. Moreover it must meet the new challenge posed by the changing role of gas, an ageing asset base and an ever increasing emphasis on competitiveness of gas now and into the future.

Faced with an ageing asset base, it is imperative that Gas Networks Ireland is given adequate allowances to deliver the capital programme and planned maintenance activities needed to ensure the security and reliability of the gas network. Any deferral of asset replacement and refurbishment negatively impacts on network safety and reliability, increases delivery risk and increases the burden on customers in future price control periods.

Providing the benefits of natural gas to a wider customer base and ensuring that costs are as low as possible for existing customers are key priorities of Gas Networks Ireland in PC4. It is of national strategic importance that natural gas fulfils the role envisaged in the White Paper. Failure to maximise utilisation of the gas network will result in Ireland missing an opportunity to decarbonise at least cost and will mean that gas customers face a risk of increasing tariffs as a result of reduced gas demand.

In PC4, Gas Networks Ireland aims to increase gas utilisation, maximise customer density on the network and help to lower carbon emissions in Ireland. Over the PC4 period Gas Networks Ireland will also deliver excellent customer service standards to meet or exceed customer charter targets.

With the delivery of the commitments outlined in this Executive Summary, Gas Networks Ireland forecasts broadly flat tariffs with a c.0.4% increase in transmission tariff and a c. 2.3% increase in distribution tariffs for the PC4 period.

Appendix – Detailed Financial Projections

Distribution Operating costs (2015/16 Monies)	Forecast 2017/18 €'000	Forecast 2018/19 €'000	Forecast 2019/20 €'000	Forecast 2020/21 €'000	Forecast 2021/22 €'000	Total PC4 €'000
Resourcing	25,730	26,038	26,250	26,433	25,566	131,016
Network maintenance	24,539	24,796	25,162	25,354	25,618	125,469
Group and Shared Services	10,129	10,362	10,516	10,636	10,626	52,271
Infrastructure support costs	14,717	14,271	14,400	13,992	13,986	71,366
Total controllable costs	**75,116**	**75,467**	**76,328**	**76,415**	**76,796**	**380,121**
Rates	10,225	10,225	10,225	10,225	10,225	51,127
Regulatory levies	1,246	1,246	1,246	1,246	1,246	6,230
Revenue protection	611	613	616	618	621	3,079
Safety advertising	2,157	2,431	2,392	2,421	2,179	11,579
Shrinkage	4,624	4,490	4,298	4,082	3,849	21,342
Total Pass through	**18,863**	**19,005**	**18,777**	**18,592**	**18,121**	**93,358**
Total operating costs	**93,979**	**94,472**	**95,104**	**95,007**	**94,917**	**473,479**

Table 8: Forecast Distribution Operating costs

Transmission Operating costs (2015/16 Monies)	Forecast 2017/18 €'000	Forecast 2018/19 €'000	Forecast 2019/20 €'000	Forecast 2020/21 €'000	Forecast 2021/22 €'000	Total PC4 €'000
Resourcing	**18,829**	**19,260**	**19,525**	**19,700**	**19,832**	**97,145**
Network maintenance	**19,731**	**25,017**	**25,770**	**19,129**	**19,048**	**108,695**
Group and Shared Services	**9,643**	**9,865**	**10,011**	**10,126**	**10,116**	**49,762**
Infrastructure support costs	**15,199**	**15,247**	**15,125**	**15,374**	**15,022**	**75,967**
Total controllable costs	**63,402**	**69,389**	**70,431**	**64,328**	**64,018**	**331,569**
Rates	**16,980**	**16,980**	**16,980**	**16,980**	**16,980**	**84,898**
Regulatory levies	**1,246**	**1,246**	**1,246**	**1,246**	**1,246**	**6,230**
CO2	**212**	**238**	**280**	**316**	**281**	**1,327**
Total Pass through	**18,437**	**18,464**	**18,506**	**18,542**	**18,507**	**92,455**
Total operating costs	**81,839**	**87,853**	**88,937**	**82,870**	**82,525**	**424,024**

Table 9: Forecast Transmission Operating costs

Capital Expenditure (2015/16 Monies)	2017/18 €'000	2018/19 €'000	2019/20 €'000	2020/21 €'000	2021/22 €'000	Total €'000
On-shore Pipeline	18,399	10,312	8,813	11,959	10,257	59,740
Compressor	10,833	17,406	12,384	10,332	19,431	70,386
AGI	18,900	28,455	25,660	15,442	14,887	103,344
Minor Works	1,875	1,875	1,875	4,075	1,875	11,575
IT & Telecoms	3,592	3,246	3,693	4,193	4,148	18,873
Grid Control	550	550	550	550	550	2,750
Other	2,079	2,053	5,463	5,129	3,994	18,717
Contributions/Grants	(6,722)	(4,460)	(1,917)	(1,320)	(598)	(15,017)
Total	49,506	59,435	56,521	50,361	54,543	270,367

Table 10: Forecast Transmission Capital Expenditure

Capital Expenditure (2015/16 Monies)	2017/18 €'000	2018/19 €'000	2019/20 €'000	2020/21 €'000	2021/22 €'000	Total €'000
Mains	33,517	30,539	28,474	27,709	27,388	147,627
Services	22,504	25,688	26,561	26,537	23,070	124,359
Meter	25,274	25,775	29,381	30,294	30,251	140,975
Meter Governor	4,405	4,801	5,743	5,896	5,896	26,741
Other Pipe Capex	15,763	20,066	22,374	27,280	27,241	112,724
IT	3,432	3,262	3,557	4,281	4,490	19,023
Other	2,398	2,505	2,678	2,753	2,319	12,652
Contributions/Grants	(10,670)	(11,581)	(11,132)	(11,009)	(10,989)	(55,380)
Total	96,624	101,053	107,637	113,741	109,667	528,722

Table 11: Forecast Distribution Capital Expenditure