

Systems Performance Report 2021





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1 Executive Summary

The Gas Networks Ireland Performance Report has been produced annually since 2008. There are two performance reports:

- Customer performance Report; and
- Systems Performance Report.

The Systems Performance Report provides an overview of how both the natural gas transmission and distribution networks have operated during 2021 in relation to all network systems activities.

Natural gas is a clean, secure, flexible, adaptable fuel which can play a key role in the transition of the Irish economy to a low carbon future, while at the same time meet Ireland's future energy needs. 2021 was an unusual year for the gas network as for the rest of economy, with the continuation of the global Covid-19 pandemic. In spite of the challenges presented by the pandemic, Gas Networks Ireland was able to maintain the performance of its system in line with Key Performance Indicators (KPIs).

Gas shippers are required to reserve capacity (space) in the natural gas network to guarantee a secure supply to each of their customers. Exit capacity reflects the amount of capacity booked by shippers on the transmission system. The amount of space reserved by shippers for each customer on the distribution network is referred to as the Supply Point Capacity (SPC). On the 31st December 2021, 255 GWh was the total exit capacity booked for Power, DM¹ I&C, NDM² and Shrinkage for the year.

1 In this instance Daily Metered (DM) customers refers to Daily Metered (DM) and Large Daily Metered (LDM) customers i.e. any customer which consumes over 5.55 GWh annually. CNG also included within this sector.

2 The Non-Daily Metered (NDM) sector refers to those who consume less than 5.55 GWh of gas annually. This covers small Industrial & Commercial (I&C) customers and residential properties.



- **Power** - Since 2017, we have seen strong growth in capacity booking mainly due to increased power demand. 2021 was slightly lower than 2020, mainly due to two prolonged outages at gas plants for a significant part of the year.
- **DM I&C** - bookings have increased since 2017 mainly due to increased load from large energy users, new town anchor load connections and the economic recovery. We saw a slight decrease in 2020 and 2021 primarily due to Covid-19 impacts. CNG bookings are also included in this sector.

- **NDM** - bookings have remained relatively stable since 2017 despite strong economic growth, mainly due to increased energy efficiency. We saw a slight decrease in 2020 and 2021 primarily in the I&C sector due to Covid-19 impacts.

The publication of the 2019 Climate Action Plan, which contained a proposed ban of natural gas boilers in new homes from 2025 onwards, caused significant uncertainty in both the new and mature domestic housing sectors. Following on from this publication, the Climate Action Plan 2021 proposed that “the installation of fossil fuel boilers in new

homes will be effectively banned by 2023” effectively shutting down the traditional new home sector for Gas Networks Ireland by the end of 2022 and causing ongoing confusion in the mature domestic and SME sectors. Since the publications of these plans, new connections have been challenging and have resulted in a slowing down of new

connection meter growth across all sectors (note that 2020 and 2021 Mature Domestic numbers were also negatively impacted by the restrictions associated with the Covid-19 global crisis). Across the three connections categories, the performance in 2019, 2020 and 2021 was as follows:

Category	2019	2020	2021
Mature Housing Connections	4,417	3,408	3,513
New Housing Connections	6,259	4,220	2,311
I&C Connections	622	465	395

Gas Networks Ireland endeavours to operate and maintain an efficient system by investing in replacement and maintenance of the pipeline assets through capital programmes and growing the network to facilitate new connections and towns, so that we can continue to deliver a safe, secure and cost effective energy solution and offset the market demand challenges. Decarbonisation of the energy sector presents future demand challenges that require planning and consideration of how the network will be used in the coming decades. Gas Networks Ireland is involved in innovative projects to develop the energy sector, including projects in the areas of Compressed Natural Gas (CNG), renewable gas and hydrogen.

Gas Networks Ireland measures its performance against several key metrics comparing it to the performance in the previous year but also measuring against KPIs that have been set out and agreed with the Commission for Regulation of Utilities (CRU). In terms of pipeline length and number of customers, the figures for 2021 have remained in line with the figures for 2020. The number of transmission connections for 2021 also remained in line with 2020, showing 28 large daily metered sites (same as 2020) and DM new connections remaining static at 19.

The total volume of gas transported through the system in 2021 decreased by 4% from 2020. The volume of Unaccounted for Gas (UAG) on the system increased from 0.19% in 2020 to 0.35% in 2021.

There are several Key Performance Indicators (KPI) that Gas Networks Ireland is required to achieve in the areas of safety, system availability, meter data services and maintenance days with all target KPIs being achieved in 2021.

In July 2021, the CRU approved Gas Network Ireland's request to spend an otherwise unassigned €2,485,000 of innovation funding on a programme of work focusing on preparing the gas network for the safe and timely transition to hydrogen. Gas Networks Ireland also undertook a technical feasibility study on introducing a 20% blend of hydrogen into a local gas distribution network in the Cork area. This included an assessment of both new and existing infrastructure.

1.1 Key Performance Summary Matrix

Category	Metric	Report Section	2020 Performance	2021 Performance	Comments
Infrastructure	Length of Transmission Pipeline	3.1 - Total length of pipe in transmission system	2,477 km	2,476 km	
Infrastructure	Length of Distribution Pipeline	9.4 - Total length of pipe in distribution system	12,140 km	12,188 km	
Connections	Total Number of connections to the Transmission Network	3.2 - Total number of connections	47	47	28 LDM & 19 DM connections
System Throughput	Total Gas Transported	4.1 - Throughput	58,688 GWh	56,259 GWh	72% - Moffat 28% - Corrib
System Throughput	Total Demand	4.2 - Demand Change	57,886 GWh	56,259 GWh	
System Throughput	Fuel Usage	4.3 - System Efficiency	669 GWh	686 GWh	Increase due to reduced flows at Corrib, requiring additional fuel to drive compressors at Moffat
System Throughput	Unaccounted for Gas (UAG)	4.4 - Transmission Unaccounted for Gas	147 GWh	254 GWh	2021 Tx UAG similar in magnitude to that of 2019
System Throughput	Total Shrinkage Gas (Own use gas and gas to replace UAG)	4.5 - Shrinkage and balancing % of Throughput	1.07%	1.26%	
System Throughput	System Balancing Actions		242	249	

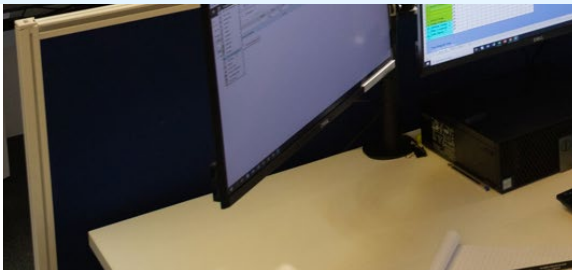
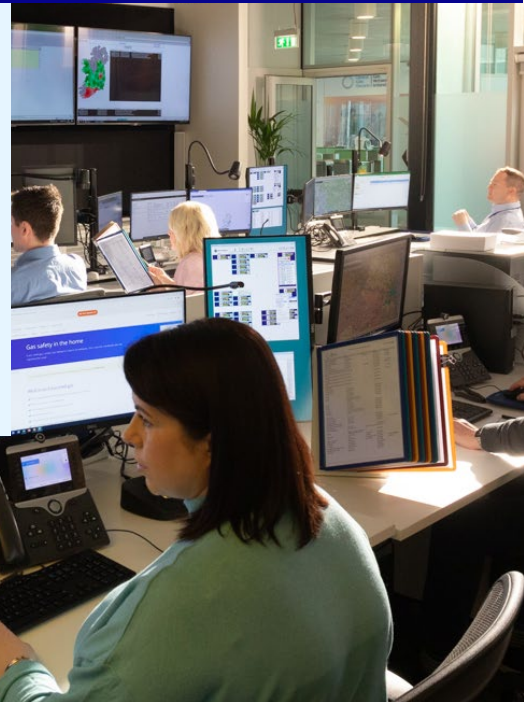


Category	Metric	Report Section	2020 Performance	2021 Performance	Comments
System Throughput	System Balancing Volume		633 GWh	591 GWh	
System Throughput	Compressor Station carbon emissions	4.6 - Carbon usage/ emissions	98,655 TCO2	99,914 TCO2	Increase due to increased use of compressors at Moffat
Capacity Bookings	Exit Capacity Bookings	4.7 - Capacity Bookings	258,916 GWh	254,815 GWh	
Capacity Bookings	Entry Capacity Bookings	4.8 - Entry Capacity Booking Process	192.80 GWh	188.90 GWh	
Gas Point Registration Office	Total number of Gas Points Registered	5.1 - Overview of GPRO	712,507	717,599	
Gas Point Registration Office	New Registrations	5.1 - Overview of GPRO	8,664	6,832	
Transmission Gas Safety	Third Party Damage (instances of unauthorised excavation in the pipeline wayleave)	7.1 - High Level Gas Safety Statistics	2,204	2,082	
Transmission Gas Safety	Third Party Damage Prevention Detected Encroachment Events	7.1 - High Level Gas Safety Statistics	50	37	
Code of Operations Obligations	GTMS System Availability	8.1 - System Availability	100%	100%	
Code of Operations Obligations	Meter Read Access Rates	8.4 - Meter Reading Access rates	80%	83%	
Code of Operations Obligations	Meter Read Rate	8.4 - Meter Reading Access rates	2.84	2.52	New KPI of 2.2

Category	Metric	Report Section	2020 Performance	2021 Performance	Comments
Distribution System	Distribution Gas Flows	9 - Distribution System	16,692 GWh	16,741 GWh	When weather corrections are taken into account, a growth in Dx gas flows is recorded
Distribution System	Distribution Unaccounted for Gas (UAG)	9.2 - Distribution UAG	0.59%	0.27%	Due to increased efforts to reduce UAG. Effects of Pandemic not clear yet.
Distribution System	Total number of connections	9.3 - Total number of connections	710,068	715,093	
Distribution System	New Connections (Total)	9.7 - New connections during year	8,093	6,219	Reduction due to several factors including new dwelling requirements to meet NZEB standards and effects of the pandemic especially in SME sector
Distribution Gas Safety	Third Party Damage	10.3 - High Level distribution safety statistics	483	403	
Distribution Gas Safety	Third Party Damage - Total inward enquiries	10.3 - High Level distribution safety statistics	20,395	23,047	
Distribution Gas Safety	Emergency Reports Total no. of calls received via the 24-hour emergency number	10.3 - High Level distribution safety statistics	26,960	26,956	

2 Introduction

The Gas Networks Ireland Systems Performance Report has been produced to comply with the licence conditions pertaining to “Overall standards and performance” of the four licences held by Gas Networks Ireland, granted by the Commission for Regulation of Utilities (CRU).



Gas Networks Ireland is responsible for developing, maintaining and operating the gas transmission and distribution systems. The Gas Networks Ireland system connects the Republic of Ireland (RoI) to Scotland, Northern Ireland (NI) and the Isle of Man (IoM). Gas Networks Ireland does not purchase, trade or sell gas to customers; it transports the gas on behalf of suppliers and shippers who purchase the gas from the wholesale gas market, and in turn use the transportation services of Gas Networks Ireland to deliver gas to over 711,000 residential and business customers throughout Ireland. The Gas Networks Ireland system includes infrastructure in RoI, regulated by the CRU; NI, regulated

by the Utility Regulator (UR); and South West Scotland, regulated by Ofgem.

The natural gas network is differentiated by prevailing pressures:

- High pressure transmission infrastructure, which operates above 16 barg (the total length of transmission pipeline is 2,476 km³); and
- Distribution infrastructure, which operates below 16 barg (the total length of distribution pipeline is 12,188 km).

The transmission system is detailed in Figure 2.1.

³ Total length of transmission pipeline is the entire network including pipeline in RoI, NI and on-shore Scotland.

Figure 2.1: Gas Networks Ireland transmission pipeline map



Natural gas is transported to over 711,000 residential and business customers through a network of 14,664 km pipelines, 24 hours a day, 365 days a year. Gas Networks Ireland is responsible for connecting all customers to the network, regardless of their supplier. The company manages a 24 hour gas emergency service, which handled 14,646 call-outs in 2020.

Through the Gas Networks Ireland Connections Policy, Gas Networks Ireland continually brings the benefits of natural gas to new towns. This activity was severely restricted in both 2020 and 2021 as a result of the effects of the pandemic and its related shutdowns.

Natural gas is actively promoted by Gas Networks Ireland as a fuel of choice for homes, businesses and industry. The organisation is keen to see greater utilisation of the natural gas network and to explore opportunities to expand the network where viable. There is considerable emphasis on investing in new business areas, such as CNG, hydrogen and renewable gas.

Throughout this report, data is presented in graphical form. The corresponding figures and statistics are located in the appendices, presented in table format, and may be referred to for interpretation of graphs and factual performance.

3 Transmission System

This report is produced to comply with condition 17 of the Transmission System Operator Licence and condition 13 of the Transmission System Owner Licence. Gas Networks Ireland's primary responsibility is to transport gas from entry to exit points on the network on behalf of customers, while ensuring that the network is operated safely and efficiently.

networks in large urban centres. In addition, the Mayo-Galway pipeline connects the ring-main to the Bellanaboy terminal, Co. Mayo, where gas from the Corrib gas field enters the Irish transmission system. The addition of the Corrib entry point at the end of 2015, brings the total number of entry points on the transmission system to three including Moffat and Inch, see Figure 2.1.

The natural gas network consists of 14,664km of pipeline, of which 2,476km is high pressure steel transmission pipelines. The RoI transmission system consists primarily of the high pressure (70 barg) ring-main linking Dublin, Galway, and Limerick. It also consists of several spur lines to Cork, Waterford and lower pressure (40 barg and 19 barg) local area (regional)

The natural gas network is comprised of high-pressure steel transmission pipes and low-pressure polyethylene distribution pipes. The transmission pipes link Ireland's major urban areas and connects Ireland to the UK. Power stations and some large industrial customers are also directly connected to the transmission network.

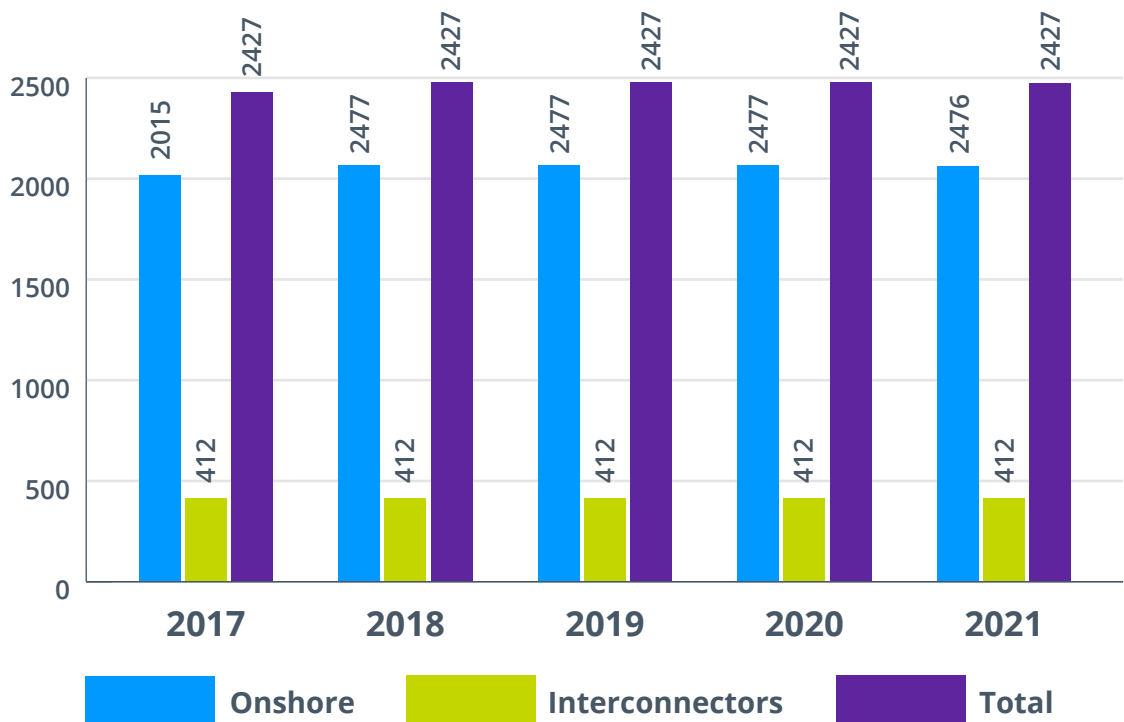


3.1 Total transmission pipeline length

The length of the transmission pipeline network has remained consistent over the last number of years with minor variations, due to adding new transmission customers or decommissioning. At the end of 2021,

the transmission network was 2,476 kilometres in length. The transmission system pipeline network consists of both onshore and offshore pipes.

Figure 3.2: Transmission pipeline length

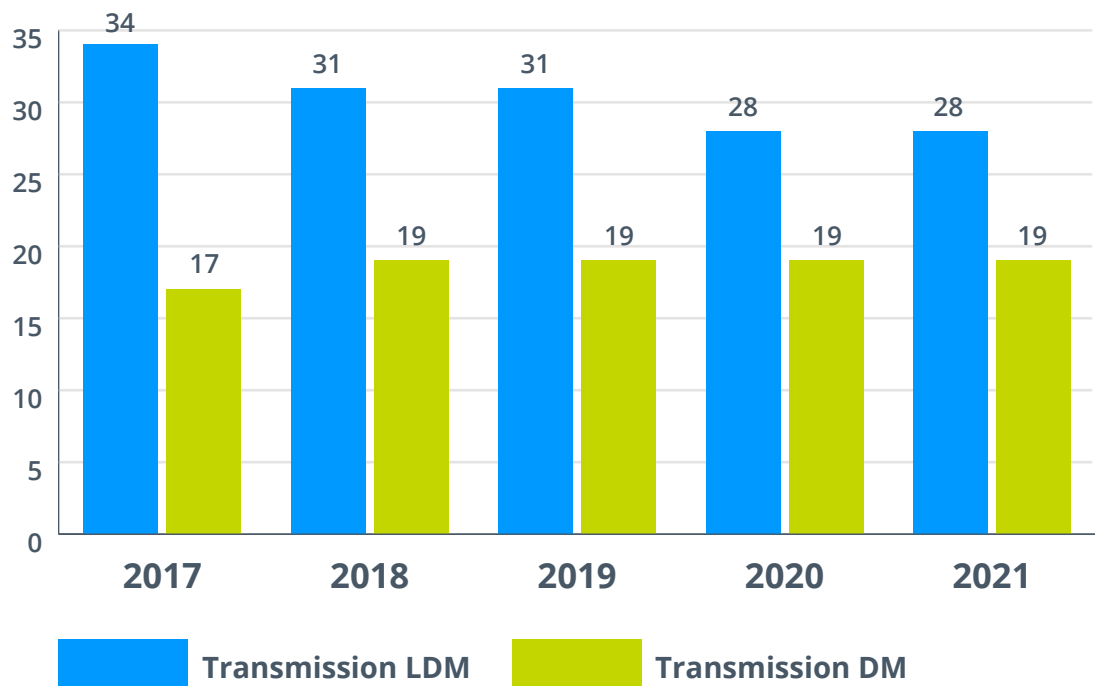


3.2 Total number of Connections

The total number of connections to Gas Networks Ireland's transmission network in 2021 was 47; of these 28 were Large

Daily Metered (LDM) sites and 19 were Daily Metered (DM) sites, see Figure 3.3.

Figure 3.3: Total no. of transmission connections



4 Transmission System Data

Managing the flow of gas from the entry points to the end consumer is a sophisticated 24-hour operation. It involves continuous monitoring of gas flows, temperatures and system pressures through a Supervisory Control and Data Acquisition (SCADA) system for both transmission and distribution networks. SCADA uses process data telemetry from all the operational sites and installations to monitor and operate

the entire gas network. In addition to the SCADA system, Gas Networks Ireland utilises a number of additional systems to assist with the operation of both the transmission and distribution networks. These include the Geographical Information System (GIS), Maximo work management system, Safe Permit for non-routine operations, work permits and online access to Gas Networks Ireland IT infrastructure and systems.



The transmission network is operated by grid control, which is a 24/7 manned control room with a team who rotate different shifts. The grid controllers are responsible for operational and commercial functions. The operational element of the control room is facilitated by SCADA to safely and efficiently operate the network including system flows, temperatures, pressures and alarm management. The commercial

aspect of gas transportation is facilitated by the Gas Transportation Management System (GTMS) through which the grid controllers ensure supply demand balance. This is achieved through management of the daily nomination and allocation process, ensuring that the correct volume of gas is always transported to meet shipper, customer and system requirements.

4.1 Throughput

System throughput is the total physical volume of natural gas transported through the Irish gas network by Gas Networks Ireland. The total gas transported for ROI in the calendar year 2021 was 56,259 GWh, which represents a decrease of 4.1% from 58,688 GWh in 2020. This includes 66

GWh of fuel gas transported for NI, which was burned at the Beattock Compressor Station. Gas transported for ROI power generation in 2021 decreased by 8% in comparison to 2020 figures. A summary of the gas throughput from 2017 to 2021 is illustrated in Table 4.3 and Figure 4.1.

Figure 4.1: System Throughput

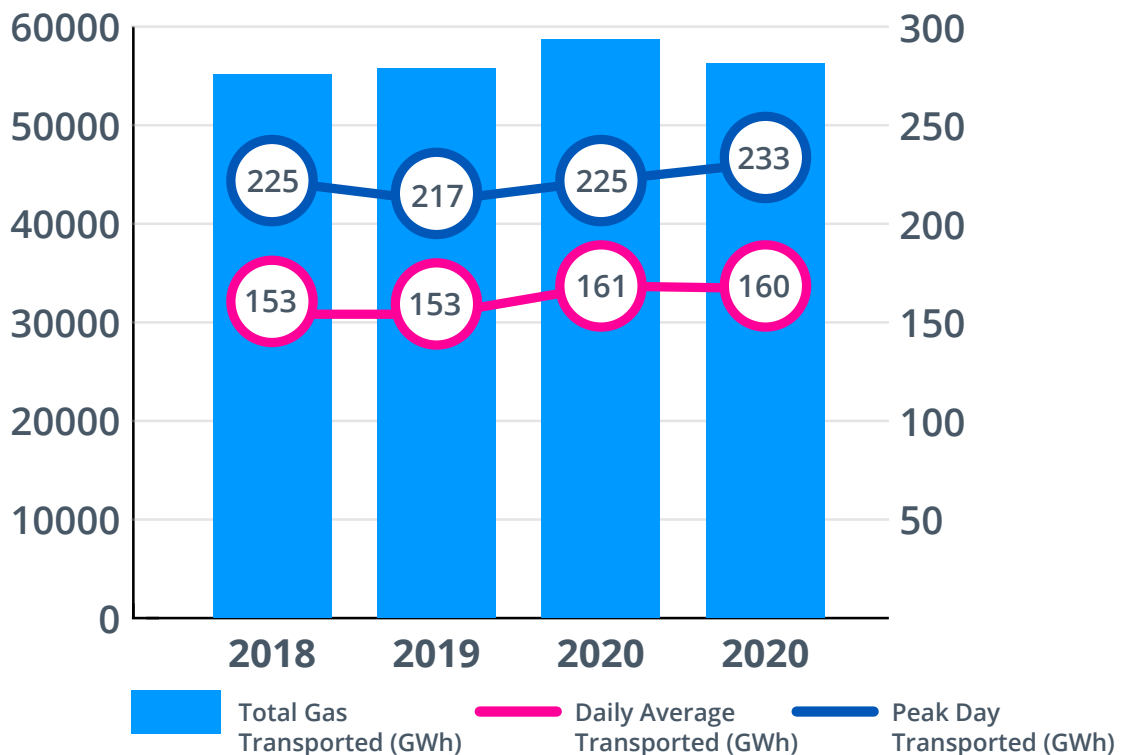
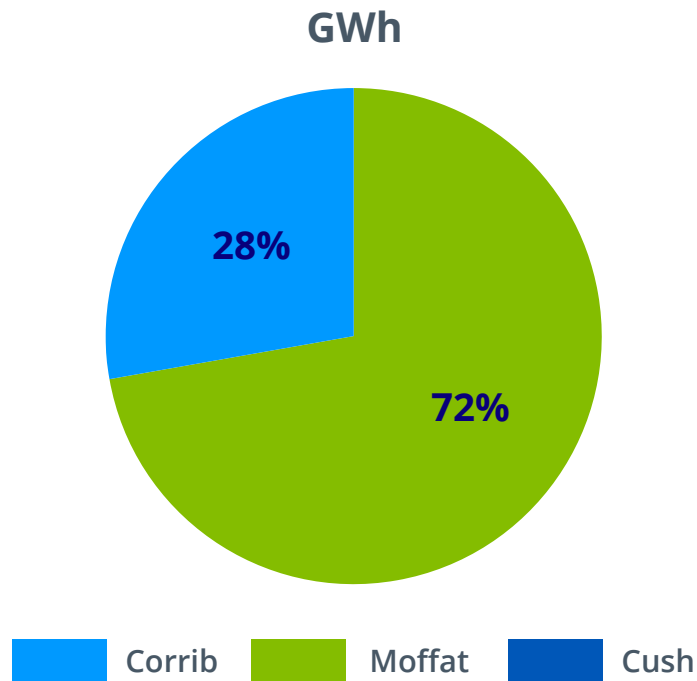


Figure 4.2: System throughput per entry point (Calendar Year 2021)



4.2 Demand change

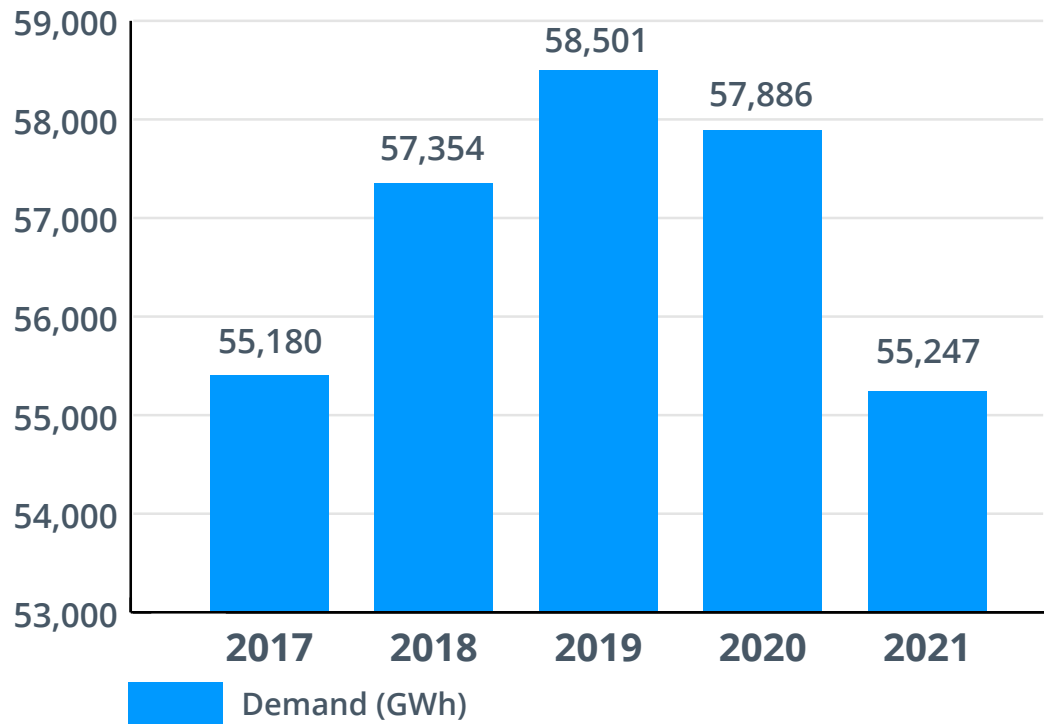
Demand is the total amount of gas physically off-taken from the gas network in Ireland each year (excluding Unaccounted for Gas (UAG) and fuel gas). Figure 4.3 reflects the demand for gas in 2021, which decreased by 5% on the 2020 demand. There was a 7% decrease in demand experienced in power generation and a slight decrease in demand for non-daily metered (NDM). Daily metered (DM) and large daily metered (LDM) recorded slight increases in demand, 2% respectively. The reason for the overall decrease in

gas demand was due to maintenance at a number of gas-fired power plants, public health restrictions and milder weather.

- Power Generation decrease of 7% was recorded;
- LDM & DM The Industrial and Commercial (I & C) sector both had an increased demand of 2% in annual demand;
- NDM The NDM sector experienced a decrease of 0.8%.



Figure 4.3: Demand change



4.3 System efficiency

(a) Delivery

The amendment to the EU Network Code in October 2015 saw the removal of the requirement for shippers to maintain a Zero Imbalance Position (ZIP)⁴. This had resulted in higher variability in entry-exit nominations at the Moffat interconnection point (IP). In order to mitigate against having large upward nomination movements late in the gas day, and to strive towards more

efficient use of the compressor stations in onshore Scotland, Gas Networks Ireland together with National Grid and PTL agreed to allow the use of exit nominations to better predict an accurate end of day entry quantity earlier in the gas day. This was approved by all the relevant regulators and implemented in October 2021.

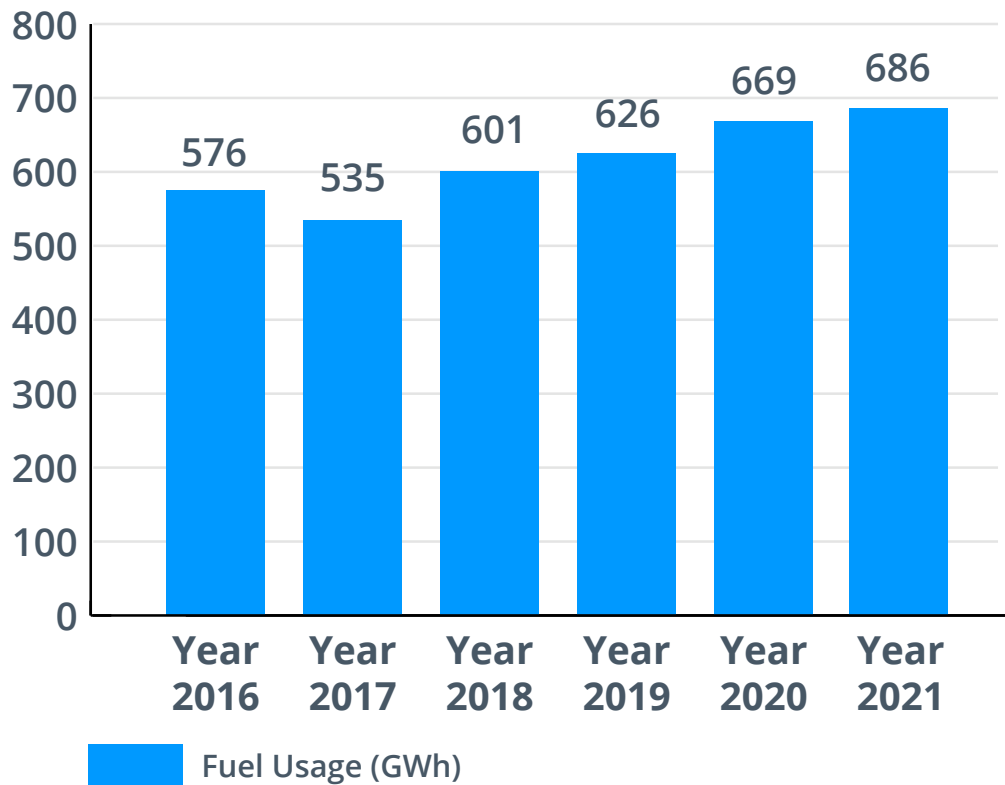
⁴ ZIP required that Total Entry Nominations = Total Exit Nominations at all times during a gas day. The requirement has now moved to an end of day requirement.

(b) Fuel Usage

Fuel usage of 686 GWh for 2021 increased from 669 GWh in 2020 as per Figure 4.4. This increase continues to be predominately driven by reduced Corrib entry gas and increased Moffat entry gas. Delivery of gas through Moffat requires operation of Beattock and Brighthouse Bay compressor

stations; which results in very high-pressure gas being received at the two landfall stations in Ireland, located at Loughshinny and Gormanston. Pressure must then be reduced to enter the ROI network. This requires the use of boilers to heat the gas prior to pressure reduction.

Figure 4.4: Fuel usage



(c) Meter Read Verification

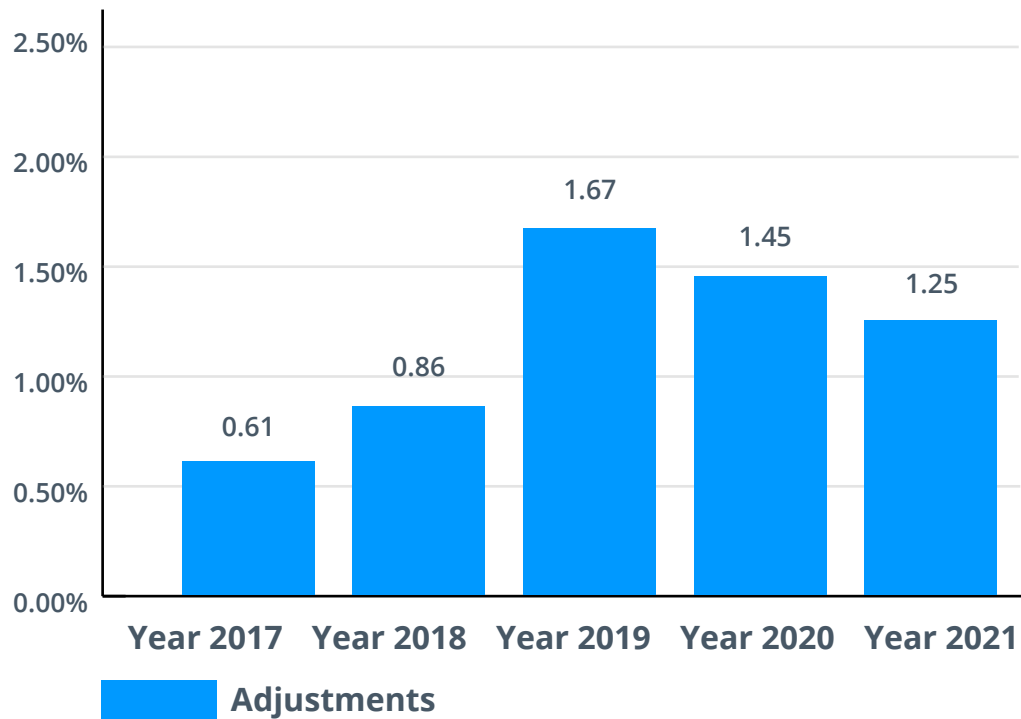
Transmission meter read verifications give an indication of the number of transmission connected gas points that require meter reading adjustments as a result of failed meter reading validation⁵. Figure 4.5 shows that 1.25% of all transmission site-metering validation checks carried out in 2021 resulted in adjustments (i.e. approximately 76 transmission site-metering monthly adjustments performed out of 6,060

metering validation checks in 2021). Adjustments are required to ensure accurate reading when a meter is out of tolerance, configured incorrectly or replaced.

Gas Networks Ireland continues to improve its daily and monthly metering validation checks, ensuring more accurate end user allocations.

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Figure 4.5: Meter read verification



⁵ Adjustments typically arise as a result of (i) a communications failure – e.g. a site telemetry failure resulting in advances in the site meter not properly communicated to GTMS via SCADA. (ii) an issue with the meter correction equipment on site

4.4 Transmission unaccounted for gas

Unaccounted for Gas (UAG)⁶ means natural gas which is lost or otherwise unaccounted for in the transportation system or any localised part thereof. Figure 4.6 relates to transmission UAG⁷ as a percentage of the overall system throughput.

UAG is dependent on a number of factors including the following;

- Gas measurement – The received gas at the three entry points differs in terms of its composition and energy value. This leads to measurement uncertainties in terms of the fixed gas component values on fiscal metering flow computers; and
- Operations and maintenance – venting of gas, purging of pipelines, meters, gas chromatographs and gas leakage.

Gas Networks Ireland has maintenance and calibration policies in place for all meters and instrumentation to ensure measurement accuracy of gas entering and exiting the system. Gas Networks Ireland's general pipeline and above ground installation (AGI) maintenance policies seek to prevent leakage and minimise venting of gas.

UAG increased in 2021, returning to levels seen in 2019. Corrib supply continues to decline, dropping in flow by 21% in 2021 compared to 2020. With Corrib supply declining and the subsequent level of penetration of Corrib gas lessening on the transmission network, Gas Networks Ireland is continuously analysing Calorific Value (CV) Zones to ensure representative CVs are utilised for CV billing zones.

⁶ Volume as a % of total gas

⁷ Transmission UAG is calculated as Entry (Stock Gas + Metered Entry) Minus Exit (Metered Exit + Shrinkage + Own Use Gas)



Figure 4.6: Transmission UAG (% throughput)

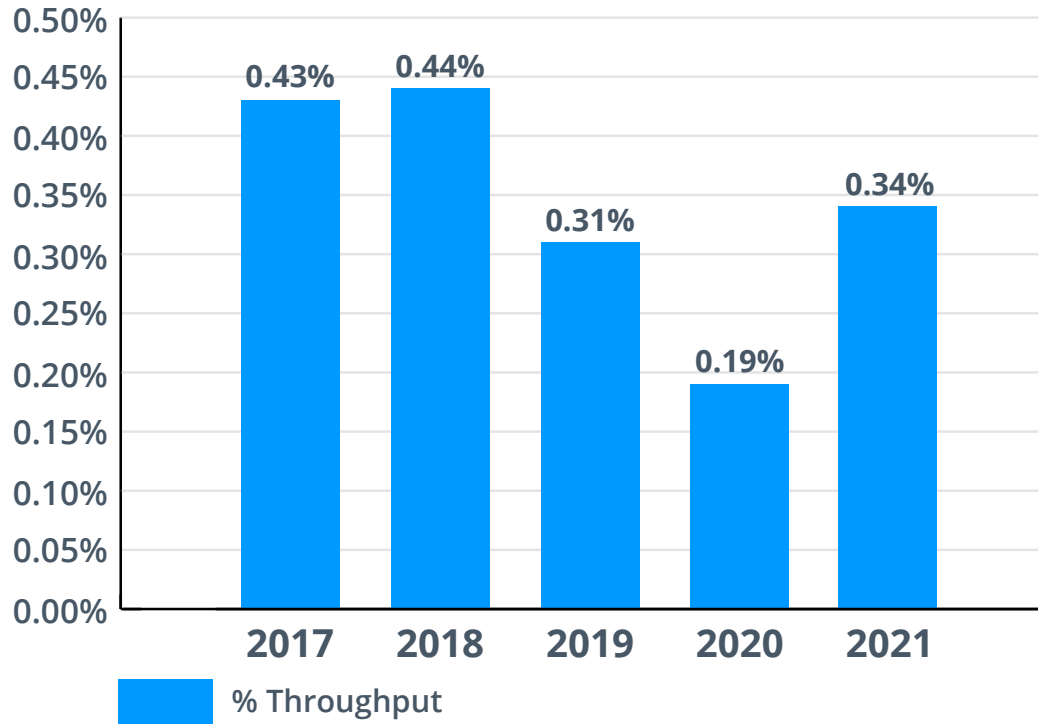
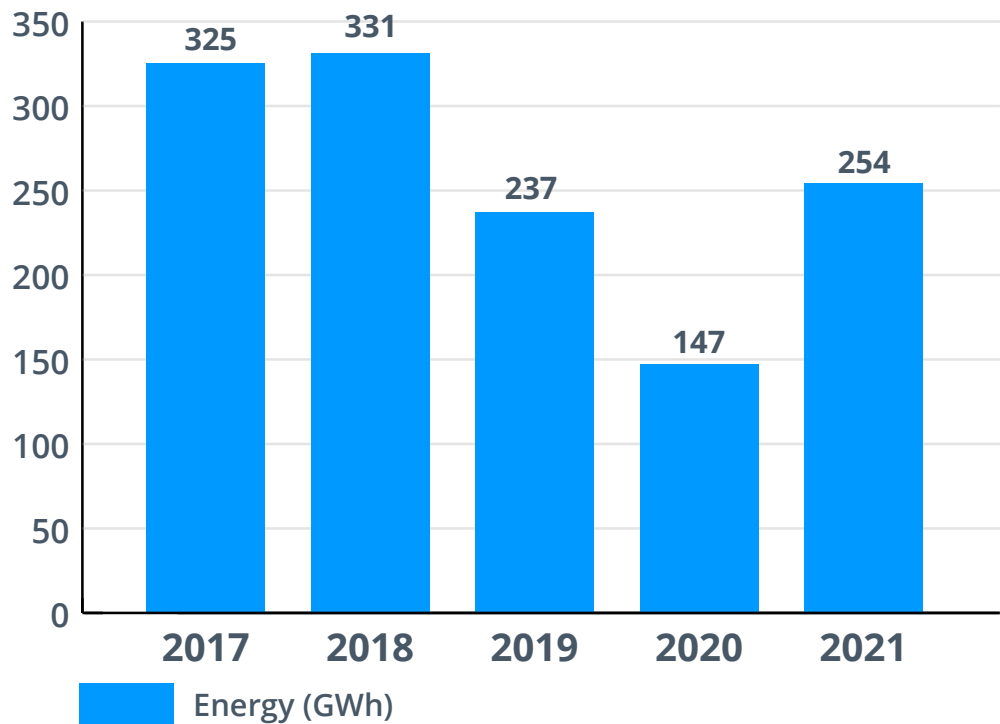


Figure 4.7: Transmission UAG (energy - GWh)

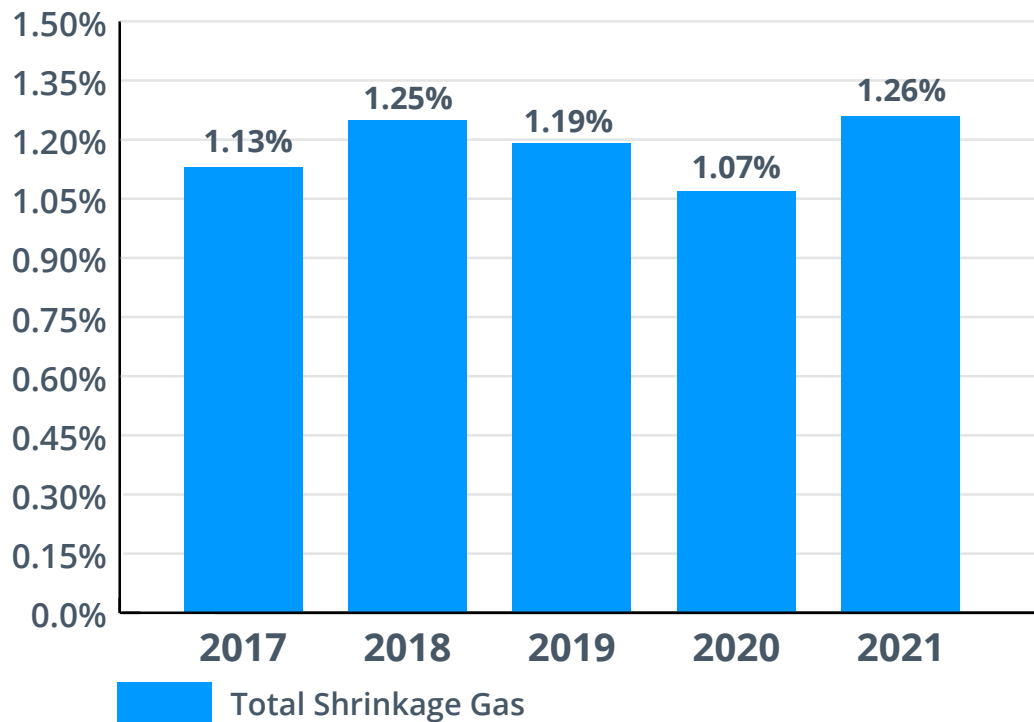


4.5 Shrinkage and balancing

'Shrinkage Gas' means own use gas and/or natural gas required to replace 'Unaccounted for Gas' (UAG) and gas used for fuel within the network.

Figure 4.8 shows shrinkage gas attributed to the RoI system as a percentage of throughput of 1.26% in 2021.

Figure 4.8: Shrinkage as % of throughput



The fuel gas component of shrinkage gas has increased, due to the continued reduction in flow at the Bellanaboy entry point. Fuel gas is used to run the compressor stations and network installations. As previously described, the TX UAG component of shrinkage has also increased in 2021, resulting in the overall increase in shrinkage requirements.

Gas Networks Ireland continues to successfully utilise the trading platform to secure shrinkage gas, in place of tendering for a shrinkage contract.

A balancing action means buying or selling gas as required to match the amount of gas entering and leaving the system. On 100 days in 2021, balancing actions were taken. Now that Gas Networks Ireland is

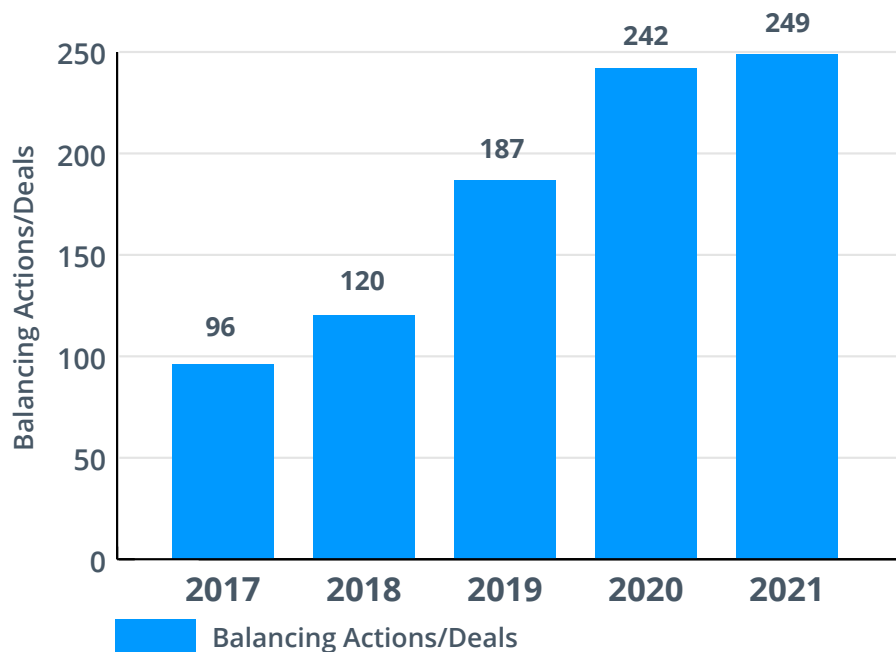
completing all balancing actions on the trading platform, there is opportunity to take smaller, more frequent balancing actions in order to continue to foster liquidity at the Irish Balancing Point (IBP). Over those 100 days in 2021, 249 individual transactions took place.

In addition, slight improvements in shipper behaviour in terms of nomination imbalances has contributed to the reduction in balancing volumes needed to maintain sufficient line-pack⁸ for network service and operational safety. This is illustrated in the table below:

Table 4.1: System balancing actions⁹

Action	2017	2018	2019	2020	2021
System balancing actions (number of)	96	120	187	242	249
System balancing volumes (GWh)	329	429	458	633	591
System balancing as a % of total volume	0.40%	0.60%	0.60%	0.80%	0.79%
ROI Shipper imbalance as % of total ROI flow	0.65%	0.51%	0.38%	1.00%	0.62%

Figure 4.9: System balancing actions



⁸ Natural gas occupying all pressurised sections of the pipeline network.

⁹ Since the 1st of June 2018 Gas Networks Ireland uses the trading platform as its primary source for balancing actions in order to ensure that these necessary balancing actions are cost efficient.

4.6 Carbon usage/emissions

Gas Networks Ireland is committed to managing its impact on the environment. Transmission system activities such as the operation of compressors affect the environment and we recognise our responsibility to manage and minimise this impact. As part of our commitment to sustainable environmental and energy practices, Gas Networks Ireland has documented environmental and energy policies¹⁰. These environmental policies address the key areas of climate change, biodiversity, waste, resource use and procurement. These energy policies specifically addresses issues of energy performance and energy efficiency¹¹, including the implementation of an Energy Management System in accordance with the requirements of ISO 50001. We have also committed to making design decisions which take into account and integrate energy efficiency considerations in the final design which ensures optimal operation throughout the life cycle of the plant, equipment and services of the gas network.

Gas compressors are used by Gas Networks Ireland to move gas through, and around, the transmission system. As a participant in the European Emissions

Trading System (ETS), Gas Networks Ireland has an emissions allowance for CO₂ emissions. Gas Networks Ireland is committed to monitoring and reducing emissions from its compressors. Gas Networks Ireland is also required to comply with environmental legislation in respect of the compressors, such as noise monitoring and mitigation. In order to meet legal obligations, it is essential to develop and maintain a robust strategy for operations, maintenance, upgrading and replacement of the compressors. This is being achieved through the capital programme; further details of which is provided in section 6.

We also recognise that methane emissions have an increased negative impact on climate change than carbon dioxide. We have established a Methane Emissions Work Group to further align our quantification methodologies and identify methane emission reduction opportunities across the business. We have developed a methane emissions management plan. This was presented this to the Gas Networks Ireland Board in December 2021. We include methane emissions as part of the Scope 1 GHG emissions reporting.

¹⁰ [Environment and Energy Policies](#)

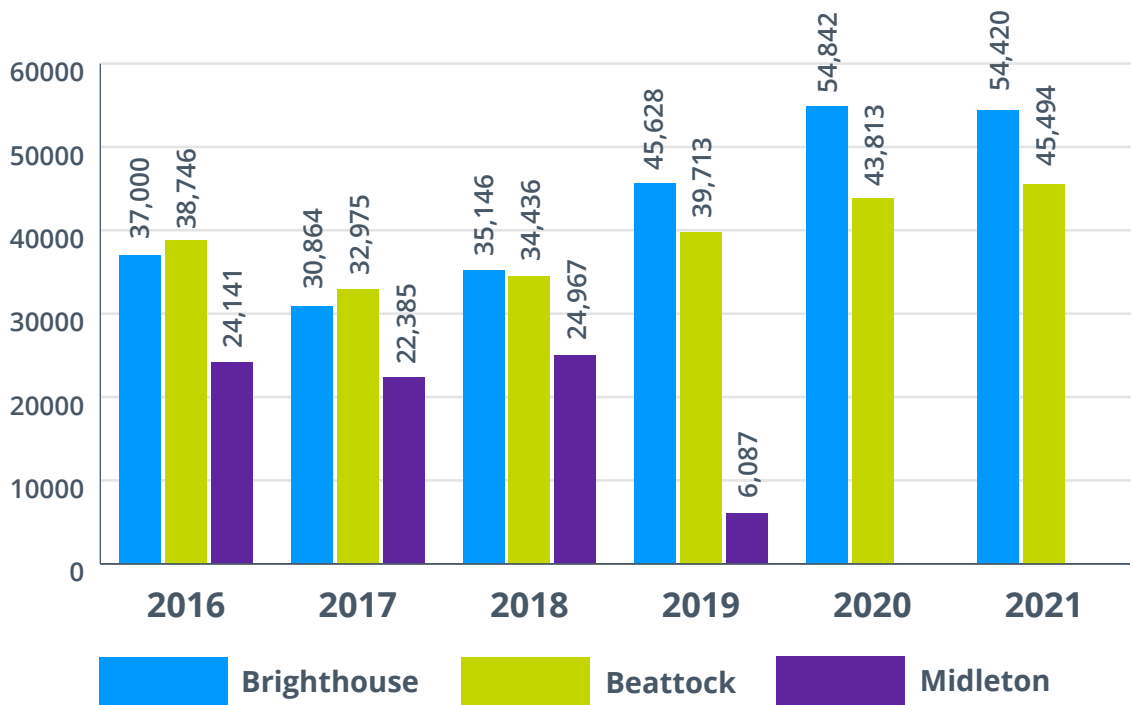
¹¹ [In 2018 Gas Networks Ireland published its first Sustainability Report which highlights progress in implementing sustainable development across all aspects of operations.](#)

We are committed to accurately calculating our methane emissions from our network, and we are an active member of MARCOGAZ, the technical association of the European natural gas industry which has 25 members in 20 different countries across Europe.

Our GHG inventory was independently verified according to ISO 14064-3:2019 Specifications in 2021 with Guidance for the Validation and Verification of Greenhouse Gas Statements.

Carbon usage is a measurement of the tonnes of carbon emissions produced at each of the compressor stations based on fuel gas consumption. Emissions reduce with lower fuel gas consumption but increase when subject to high flow variation (e.g. intra-day peaks). This variation arises where the compressors are forced to operate outside their most efficient operating range.

Figure 4.10: Compressor station carbon emissions



4.7 Capacity bookings

Gas Networks Ireland transports natural gas around the country on behalf of licensed natural gas shippers. These shippers are required to reserve capacity (space) in the natural gas network to guarantee a secure supply to each of their customers. Exit capacity reflects the amount of capacity booked by shippers on the transmission system. The amount of space reserved by shippers for each customer on the distribution network is referred to as the Supply Point Capacity (SPC). On the 31st December 2021, 255 GWh was the total exit capacity booked for Power, DM¹² I&C, NDM¹³ and shrinkage for the year. This is shown in Table 4.12 and illustrated in Figure 4.11.

Power - Since 2017, we have seen strong growth in capacity booking mainly due to increased power demand. 2021 was slightly lower than 2020, mainly due to two prolonged outages at gas plants for a significant part of the year.

DM I&C - bookings have increased since 2017 mainly due to increased load from large energy users, new town anchor load connections and the economic recovery. We saw a slight decrease in 2020 and 2021 primarily due to Covid-19 impacts. CNG bookings are also included in this sector.

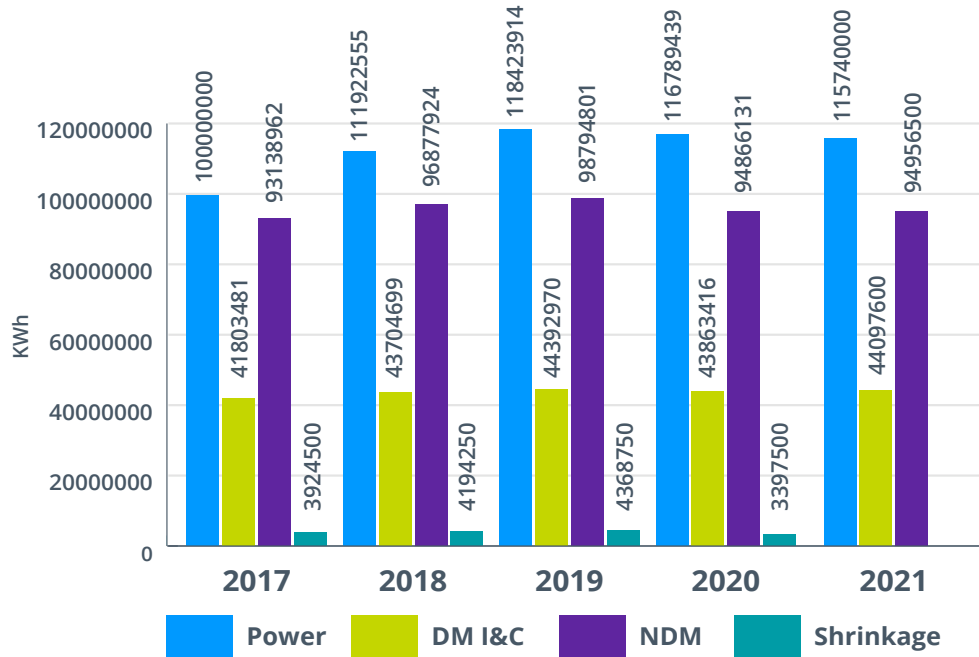
NDM - bookings have remained relatively stable since 2017 despite strong economic growth, mainly due to increased energy efficiency. We saw a slight decrease in 2020 and 2021 primarily in the I&C sector due to Covid-19 impacts.

12 In this instance Daily Metered (DM) customers refers to Daily Metered (DM) and Large Daily Metered (LDM) customers i.e. any customer which consumes over 5.55 GWh annually. CNG also included within this sector.

13 The Non-Daily Metered (NDM) sector refers to those who consume less than 5.55 GWh of gas annually. This covers small Industrial & Commercial (I&C) customers and residential properties.



Figure 4.11 Exit capacity bookings



On 31st December 2021, 119 GWh was the total SPC for DM I&C, NDM I&C and Residential customers as shown in Table 4.12 and illustrated in Figure 4.12.

Figure 4.12: Distribution SPC bookings

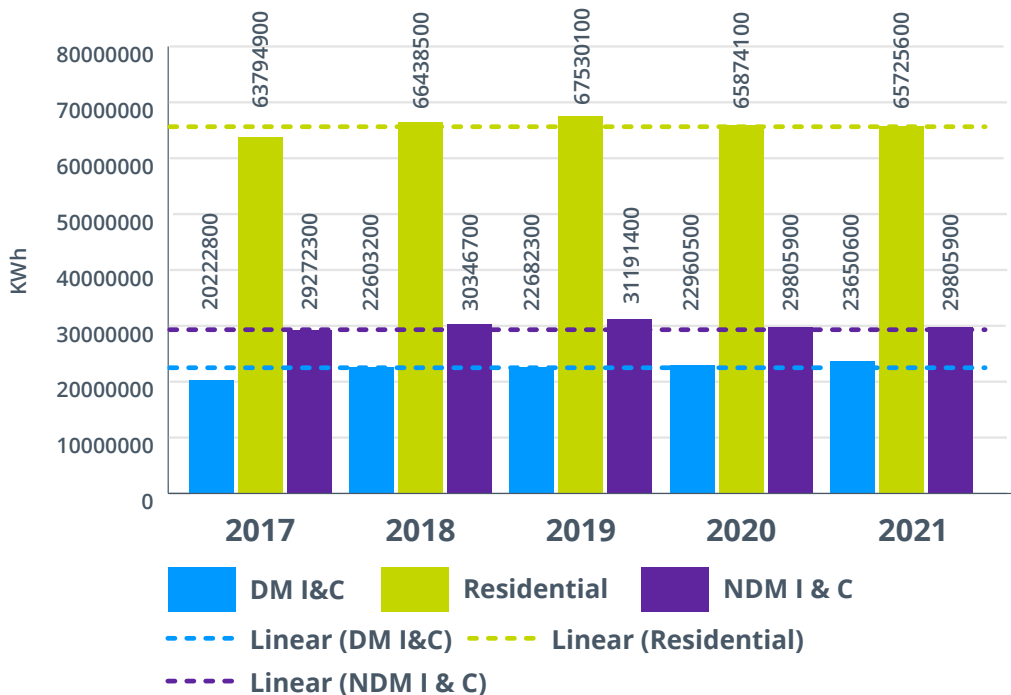


Table 4.12: Exit capacity and Distribution SPC bookings (kWh) (kWh)

	31/12/17	31/12/18	31/12/19	31/12/20	31/12/21
Power	99,575,135	111,922,555	118,423,914	116,789,439	115,739,598
DM I & C	41,803,481	43,704,699	44,392,970	43,863,416	44,097,615
NDM	93,138,962	96,877,924	98,794,801	94,866,131	94,956,520
Shrinkage	3,924,500	4,194,250	4,368,750	3,397,500	0
Total	238,442,078	256,699,428	265,980,434	258,916,486	254,815,762
Distribution SPC (kWh)	31/12/17	31/12/18	31/12/19	31/12/20	31/12/21
DM I & C	20,222,761	22,603,166	22,682,300	22,960,478	23,650,604
Residential	63,794,927	66,438,547	67,530,069	65,874,125	65,725,621
NDM I & C	29,272,311	30,346,708	31,191,411	29,805,925	29,805,925
Total	113,289,999	119,388,420	121,403,780	118,640,529	118,980,290

Note: in recent years the annualised bookings (which includes short-term) are reported on.

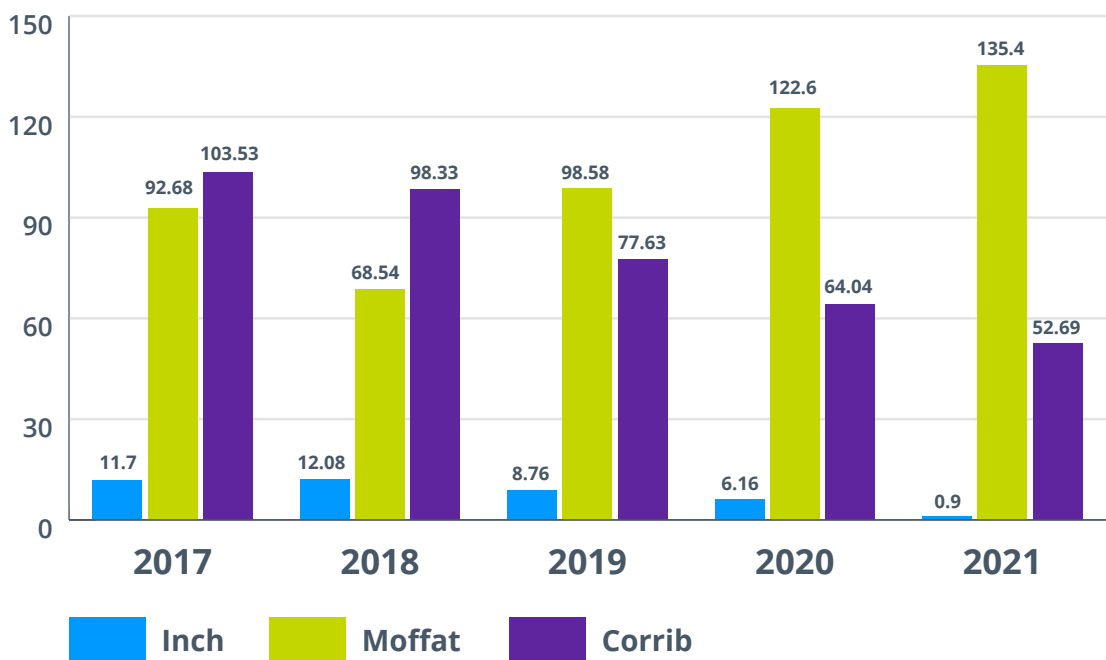
4.8 Entry capacity booking processing

Entry capacity means capacity at an entry point to the transmission system required to take delivery of natural gas to the transportation system. There are various rules concerning the entry booking process outlined in the Code of Operations. The entry capacity booked at Corrib is predominantly annual, with some short-term capacity booked as required. This pattern was also observed at the Moffat and Inch entry points. As

Corrib production continues to decline and Inch approaches its decommissioning, bookings are shifting back towards Moffat as the marginal source of gas.

It should be noted that these are annual capacity bookings at each of the entry points. In addition, there are short term products available which have not been included.

Figure 4.13: Annual entry capacity bookings (GWh)



4.9 Performance standards

There was no safety incident reported under guidelines in 2021.

Table 4.2: Transmission service standards 2021

Customer Commitments	KPI	2013	2014	2015	2016	2017	2018	2019	2020	2021
Safety & Quality	0	0	0	1	1	1	0	0	0	0
Reportable Safety Incidents										



5 Gas Point Registration Office

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5.1 Overview of GPRO

The function of the Gas Point Registration Office (GPRO) is to maintain a register for each Gas Point through which a natural gas customer is supplied; this includes registrations and de-registrations.

The change of shipper (CoS) process within Gas Networks Ireland is managed by the GPRO. This process is essential in order to facilitate an open market and enable competition between suppliers, by allowing customers to easily change from one shipper to another. The GPRO is responsible for all supply point ownership transfers within the Gas Point Register.

The GPRO provides information and reports to the CRU and industry on historic activity; it processes corrections and amendments, and it maintains the I&C listing, the vulnerable customer and priority customer lists¹⁴. The total number of gas points registered on the 31st of December 2021 was 717,599. This was a 0.7% increase on the number registered on the same date in 2020. The total number of new Gas Points registered during the year 2021 was 6,832. There were 785 gas points deregistered during the year¹⁵.

Suppliers have been focused on getting existing gas customers to switch suppliers. Ireland has one of the most active markets for customer switching in Europe. The retail energy providers invest heavily in advertising and marketing incentives, such as cheaper rates and bundle offers. There was a 7.6% increase in switching activity in 2021 when compared to 2020. Many factors can influence switching behaviour; such as consumer sentiment and inertia, points of differentiation between the suppliers, attractive offers, recruitment and retention campaigns.

There was a decrease of 38.4% in the number of historical consumption requests during 2021, such as requests for bulk data releases from the Central Statistics Office (CSO), Sustainable Energy Authority of Ireland (SEAI) and the Office of Government Procurement (OGP). The data requests were to fulfil reporting requirements on energy consumption at various sites and for the population as a whole.

¹⁴ Vulnerable customers.

¹⁵ The criteria for deregistration of GPRNs is that they have been locked, no end-user assigned and no consumption has been recorded at the premises for 18 months.



Category	LDM	DM	NDM I/C	NDM Domestic	2021 Total	2020 Total	% Change from 2020
Gas Points Registered @ 31 Dec 2021	43	269	27,302	689,985	717,599	712,507	0.7%
Total Gas Points Registered during 2021	0	4	437	6,391	6,832	8,664	-21.0%
Gas Points Deregistered during 2021	N/A	N/A	120	665	785	1,221	-35.7%
Tariff Exempt NDM Supply Points @ 31 Dec 2021	N/A	N/A	181	1,308	1,489	1,359	9.6%
Total Tariff Exempt NDM Supply Points during 2021	N/A	N/A	182	1,712	1,894	3,914	-51.6%
Change of Shippers Jan - Dec 2021	1	173	2,138	120,270	122,582	113,952	7.6%
Historical Consumption Requests Jan -Dec 2021	6	119	7,767	N/A	7,892	12,812	-38.4%



Category	31st December 2020	31st December 2021	% change
Transmission LDM	28	28	0%
Transmission DM	19	19	0%

Figure 5.1: Total gas points and market activity

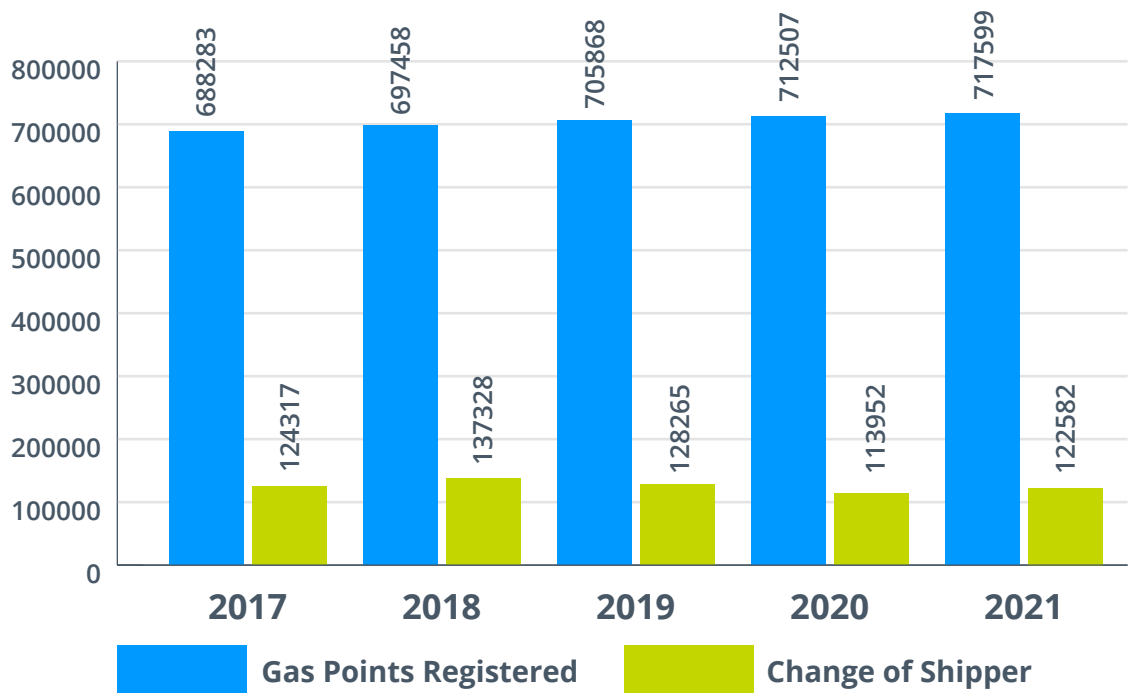
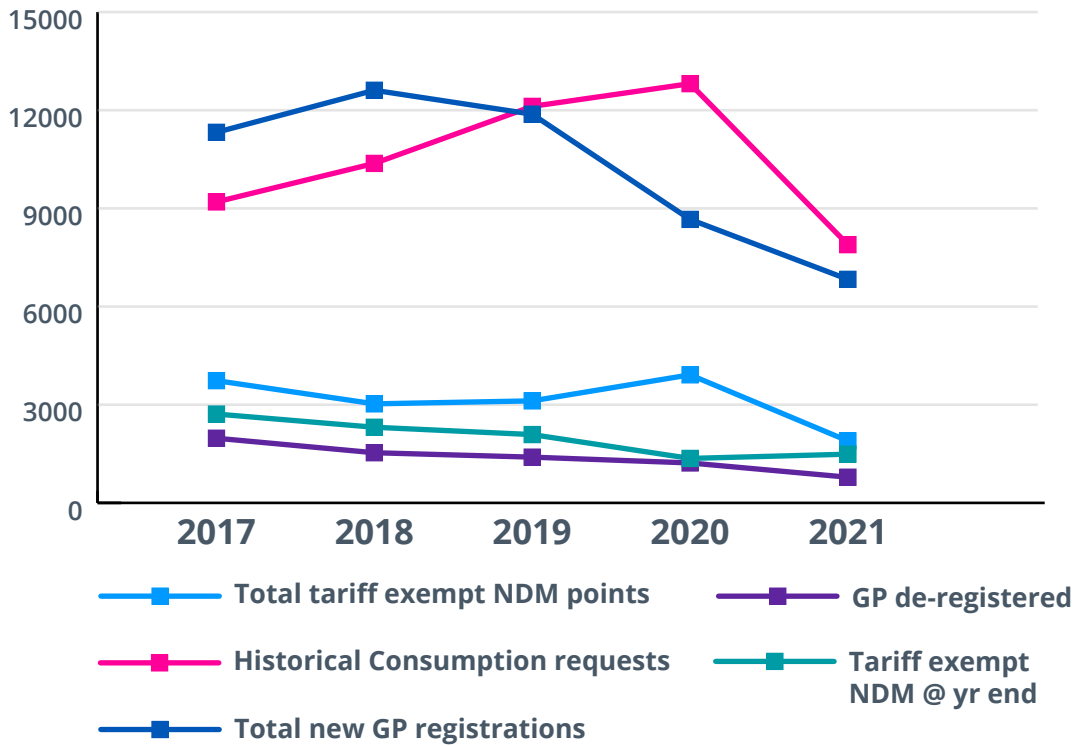




Figure 5.2: Gas point activity by year¹⁶



16 For a meter to be considered Tariff Exempt, it has to be locked more than two months and no customer registered for more than one month. If there is no consumption two months after the lock, the GPRN becomes tariff exempt (G701N message to supplier).

6 Achievement of Capital Programme

As part of the Price Control (allowed revenues) process, the CRU and Gas Networks Ireland agree a 5-year programme of capital works for the transmission network. Gas Networks Ireland is currently in its fourth regulatory price control period (PC4), which runs from October 2017 to September 2022. The programme includes works relating to reinforcement, refurbishment and new supply.

Additional works outside of the programme can be undertaken in the period if proposed by Gas Networks Ireland and agreed by the CRU. Gas Networks Ireland continues to work with stakeholders to extend the natural gas network to new towns. Gas Networks Ireland welcomes new sources of gas supply and remains willing to discuss prospective projects with project promoters.



6.1 Reinforcement

Reinforcement programmes are carried out to increase the capacity of the network in response to increased demand. Examples of reinforcement projects include upgrades to increase the capacity of an above

ground installation (AGI), adding new AGIs to the network or major pipeline projects. During 2021, construction commenced on a capacity upgrade of Collinstown AGI.

6.2 Refurbishment

Refurbishment programmes involve the upgrading or replacing of certain network assets due to the age or condition of the existing asset. Examples of refurbishment projects include:

- replacement of inefficient and ageing boilers at AGI locations with reliable and more efficient units;
- upgrade works to bring pressure reduction sites into compliance with the ATEX¹⁷ directive; and
- installation of attenuation measures to limit noise emissions in the vicinity of pressure reduction sites.

Some highlights from the refurbishment programme during 2021 included:

- boiler replacement projects were completed at 4 AGIs.
- ATEX refurbishment projects were completed at 7 AGIs.
- Remediation of pipe supports was completed at 17 AGIs.
- security upgrades were completed at 26 AGIs.

17 The ATEX directive consists of two EU directives describing what equipment and work environment is allowed in an environment with an explosive atmosphere.

Table 7.1 Safety statistics

Reference Items	Compliance Monitor	2017	2018	2019	2020	2021	
1A	Public Reported Escapes (PREs) (Reported Leaks)	Total Reported Escapes	10	4	4	N/A	N/A
6B	Third Party Damage	Development enquiries requiring action	998	1070	1322	2204	2082
1D	Third Party Damage	Category A - Pipeline Damage or Leak	0	0	0	1	0
		Category B - Serious Potential for Damage	12	5	14	13	18
	Prevention Detected	Category C - Limited Potential for Damage	23	42	22	36	19
	Encroachment Events	Total detected encroachment	35	47	36	50	37
1E	Transmission Pipelines	Line breaks (major leakage)	0	0	0	0	0
		Line damaged (sustainable level of leakage)	0	0	0	0	0
		Line damaged (no leakage)	0	1	1	1	0
2A	Pressure Control	Occasions where pressure drops below minimum design pressure	0	0	0	0	0
2C	Gas Outages	Occasions where pressure is greater than 1.1 x Maximum Operating Pressure	0	0	0	0	0
		Number of Unplanned Outages	0	0	0	0	0

6.3 Interconnectors

This programme involves the refurbishment and upgrading of assets on the onshore Scotland network, which is connected to the onshore Ireland gas network via two sub-sea interconnectors. These projects primarily involve works on the two compressor station sites at Beattock and Brighthouse Bay in Scotland.

During 2021 a number of refurbishments projects were carried out including:

- Construction is substantially complete on a major upgrade of Beattock Compressor Station to increase its operational flexibility, reliability and performance in order to meet current and future shipper/market demands and environmental and regulatory requirements. The last remaining element of the project, relating to integration of the AGI and station control systems on-site, will take place in 2022.
- The ongoing replacement of 19 high priority valves at Brighthouse Bay Compressor Station continued with 18 valves now replaced.

In addition, a number of significant projects are planned for construction in 2022. These include:

- Security upgrades at four sites on the onshore Scotland network, namely, Beattock and Brighthouse Bay Compressor Stations, Twynholm AGI and Cluden Block Valve. The procurement competition for the design and build contract for the project was completed in December 2021 with construction due to commence in Quarter three 2022.

Electrical system upgrade at Beattock and Brighthouse Bay Compressor Stations. Construction on this project is expected to commence in the second half of 2022.

7 Transmission Gas Safety

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7.1 High Level Gas Safety Statistics

This section of the report is an extract from quarterly reports submitted to the CRU under the natural gas safety regulatory framework (the 'framework'). All information has been provided to the best ability of Gas Networks Ireland at the time of submission to the CRU. The report includes key performance indicator (KPI) measures and statistics that have been under continuous

monitoring during 2021. The purpose of the KPIs is to identify opportunities for improvement and to ensure the network continues to be managed in a safe manner.

The reference numbers 1 – 5 denotes metrics grouping under the key safety regulatory objectives.



Reference Items		Compliance Monitor	2017	2018	2019	2020	2021
3A	Gas Quality	Number of non-compliant events (constituent parts outside criteria)	1	0	2	0	0
3B	Gas Quality	% Availability of the gas measurement equipment	100%	100%	100%	100%	100%
4A	Gas Supply Emergencies	Local Gas Supply Emergencies 5,000 - 9,999 customers affected	0	0	0	0	0
		NGEM Emergencies > 10,000 customers affected	1	0	0	0	0
4B	Gas Emergency Exercises	Emergency Exercises planned per annum (minimum)	2	2	2	2	2
		Emergency Exercises undertaken	4	3	3	2	3
5A	Incidents	Gas Related Incidents	0	0	0	0	0

7.2 Third party damage

Third party development enquiries which potentially impacted on the transmission network and required response from Gas Networks Ireland stood at 2,082 in 2021, down slightly from 2,204 in 2020, but still increased from 1,322 in 2019. The increase is attributed to the launch in Q4 of 2019 GNI's online 'Dial Before You Dig' service which resulted in a notable increase in enquiries. The outcomes of some of these engagements may ultimately involve a range of control measures including supervision of works in close proximity to Gas Networks Ireland pipelines, but this is dependent upon whether or not the development work ultimately takes place, the nature of the work, and the proximity of it to the pipeline.

There were 37 total encroachments (instances of unauthorised excavation in the pipeline wayleave) detected in 2021, a decrease from the 50 detected in 2020. Since 2011, Gas Networks Ireland has classified transmission pipeline encroachments in line with the United Kingdom Onshore Pipeline Operators Association (UKOPA) model, these include:

Category A: Pipeline leak or damage;

Category B: Potential for damage; and

Category C: Limited or minimal potential for damage.

Category A is the most severe and includes actual damage to a transmission pipeline, wrap or sleeve. There were no Category A encroachments in 2021. Categories B and C relate to a level of potential damage and are differentiated by the actual activity and method carried out in the vicinity of the pipeline. Category B encroachments are deemed to have serious potential for damage while Category C have limited potential for damage. Gas Networks Ireland reviews each encroachment and monitors trends closely.

Gas Networks Ireland is committed to reducing encroachments and third-party damage on the gas network and has taken several steps to improve the 'Dial Before You Dig' service, culminating in the launch of an online service in Q4 2019. See Section 10.6 for further details.

7.3 Update on the Safety Case

Gas Networks Ireland operates its activities in accordance with the Gas Safety Regulatory Framework. The Gas Networks Ireland Transmission System Safety Case demonstrates the safety management arrangements in place for the network.

Within the Safety Case Framework a quarterly KPI report is submitted to the CRU for review. The Gas Networks Ireland Transmission System Safety Case was revised in December 2020 and is the current accepted safety case as of 31st December 2021. The Safety Case demonstrates the arrangements that are in place for:

- The safe control and operation of the transmission system;
- The management of the life cycle of the assets including design, construction, commissioning, maintenance and repair, reinforcement and renewal, and decommissioning and abandonment;

- Ensuring that staff meet the required standards of qualification and competence;
- Emergency preparedness;
- Ensuring that gas transported in the network meets required standards for gas composition and quality;
- Hazard assessment and mitigation of the risks to a level that is as low as is reasonably practicable associated with the transportation of gas;
- Compliance with relevant standards and codes of practice; and
- Cooperation with third parties.

Under the Framework, Gas Networks Ireland is required to conduct a full independent audit of its safety case every five years to ensure that the safety case remains a 'living document' within the organisation and fully reflects the current safety operating measures and practices.

7.4 Update on National Gas Emergency Manager Activities

Gas Networks Ireland was appointed as the National Gas Emergency Manager (NGEM) by the CRU in 2008, in accordance with the Gas (Interim) (Regulations) Act 2002, as amended. The Natural Gas Emergency Plan (NGEP) is the industry procedure for managing a network gas emergency and provides details on the role of the NGEM. The NGEP (Version 4) is available to download from Gas Networks Ireland's website.

The Natural Gas Emergency Plan (NGEP) is subject to annual testing through an emergency exercise against a credible scenario arranged by the NGEM. The 2021 emergency exercise, titled 'Exercise Celsius' was carried out on the 5th October 2021. The interaction between the gas and electricity system operators

in an emergency is of critical importance and was also tested as part of Exercise Celsius. Feedback on the exercise was sought from industry participants and an exercise report has been compiled by the NGEM which includes some actions and recommendations for future exercises.

Gas Networks Ireland also participated in the UK's Network Emergency Co-ordinator (NEC) annual emergency exercise which took place on the 29th and 30th September 2021. The aim of the exercise was to demonstrate that the gas industry is prepared and able to meet its obligations in the event of a Network Gas Supply Emergency (NGSE) in the UK.

8 Code of Operations Obligations

The Code of Operations governs the relationship between the transporter and the shippers on the transportation (transmission and distribution) network. By signing framework agreements, shippers accept the terms of the Code of Operations. In February 2005, the CRU approved the implementation of a new Code of Operations (the Code) which governs the rules for both the transmission and the distribution networks. These rules became effective on 1st April 2005.

The latest version of the Code (Version 5.02) was published in April 2018 and comprises sections outlining the general principles of regulatory compliance; the capacity arrangements (both entry and exit); the nomination and allocation arrangements; balancing; shipper registration; gas specification and quality; as well as various sections on congestion management, legal and general.



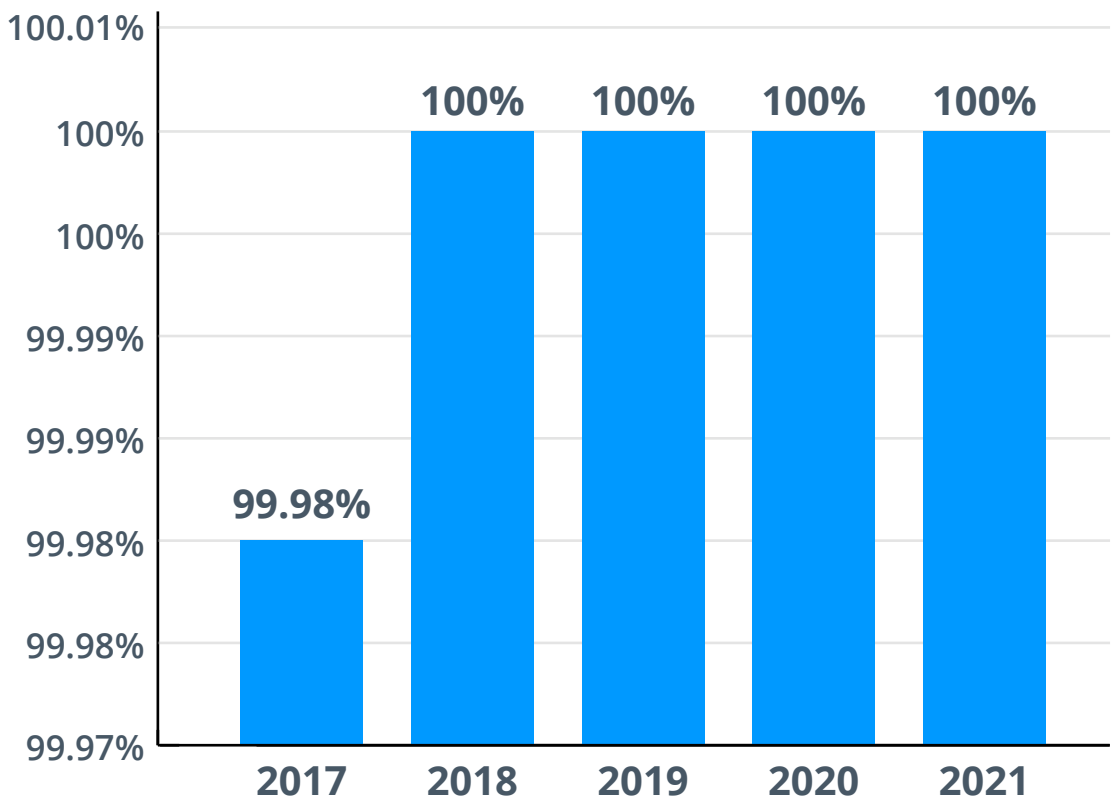


8.1 System availability

Grid Control is responsible for monitoring the GTMS and managing the daily nomination and allocation process, ensuring that the correct volume of gas is transported at all times to meet

shippers' and customers' requirements. The KPI for GTMS system availability is 99.8%, this target has been consistently achieved over the years and in 2021 the system was available 100% of the time.

Figure 8.1: System availability



8.2 NDM Change of Shipper (CoS) processing

The CoS process governs the recording of a change of registration of NDM supply points between shippers on the Gas Point Register. A number of performance targets have been set in terms of processing

requests for change of shipper and entry and exit capacity booking requests. These are outlined in table 8.3 in the appendix. The performance targets have been consistently achieved over the past five years.

8.3 Invoice circulation

The trading and settlements team in Gas Networks Ireland generates and issues transportation invoices

for all shippers on a monthly basis. The invoices are for transmission and distribution capacity and commodity.

Table 8.5 - Trading and Settlements

Customer Commitment	KPI	2017	2018	2019	2020	2021
Invoice circulation	By 12th day of month	100%	100%	100%	100%	100%

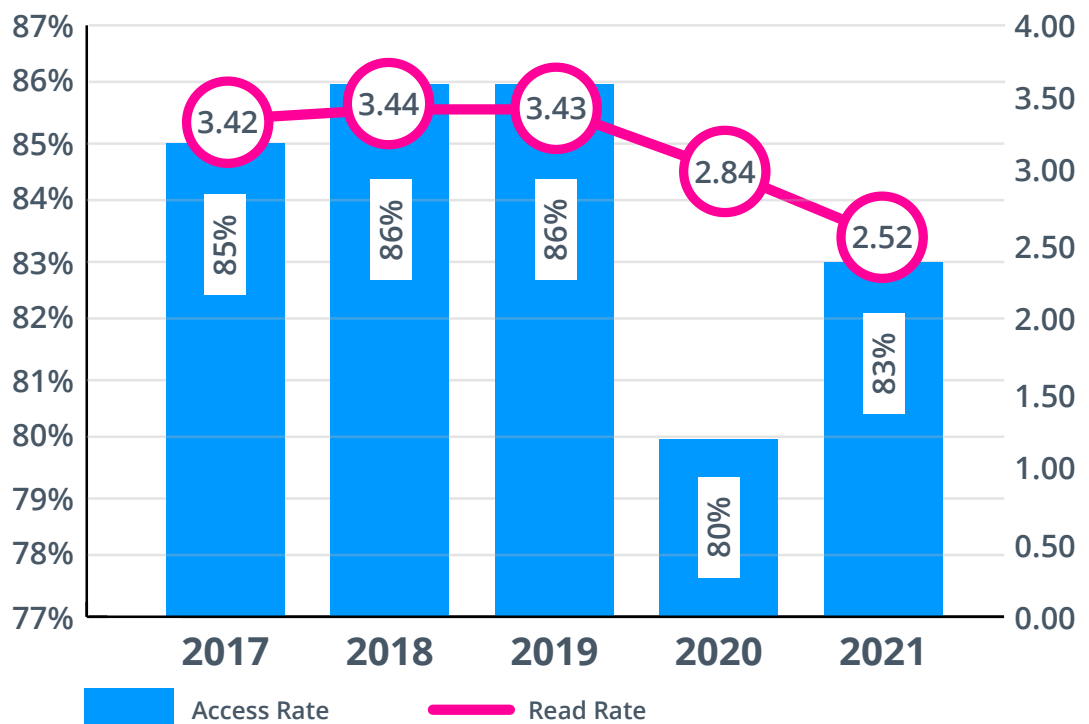


8.4 Meter reading access rates

This process governs the receipt and validation of all meter read information for generic and volume corrected NDM gas points. The access rate in 2021 for credit was 83%, this is above the KPI of 80% which has been consistently achieved by Gas Networks Ireland over the past five years. This KPI is the expected average annual access rate for all NDM sites in total. The target is to maintain total access levels at 80% or above per annum. Increased number of callbacks to sites and variation of start times in different areas has helped to achieve this consistency in access levels. The read rate per site in 2021 was 2.52 times.

The KPI for how often a meter is read per calendar year is 2.2 times. This covers the expected average read rate per individual site. The target is an average of 2.2 per annum. The target takes into account that if three calls are made to a site to take a reading there may still be times when access is not available. If this target average read rate was set at 3 per annum it would mean that to achieve it, access would have to be gained at each site every time a call was made.

Figure 8.2: Meter read access rates



8.5 Meter data services

In conjunction with the Code of Operations, procedures are in place that govern forecasting of demand at gas points and determining allocations by the transporter for the reconciliation process. The KPI for accuracy of forecasting, allocation and reconciliation (FAR) is that 80% of reconciliation adjustments are less than or equal to 1,250 kWh for domestic

customers and are less than or equal to 4,500 kWh for I&C customers. 2020 and 2021 saw a drop in the percentage of domestic (credit meters) and I&C reconciliations less than 1,250 kWh and 4,500 kWh respectively. This was due mainly to the effects of the COVID-19 pandemic restrictions and their subsequent removal.

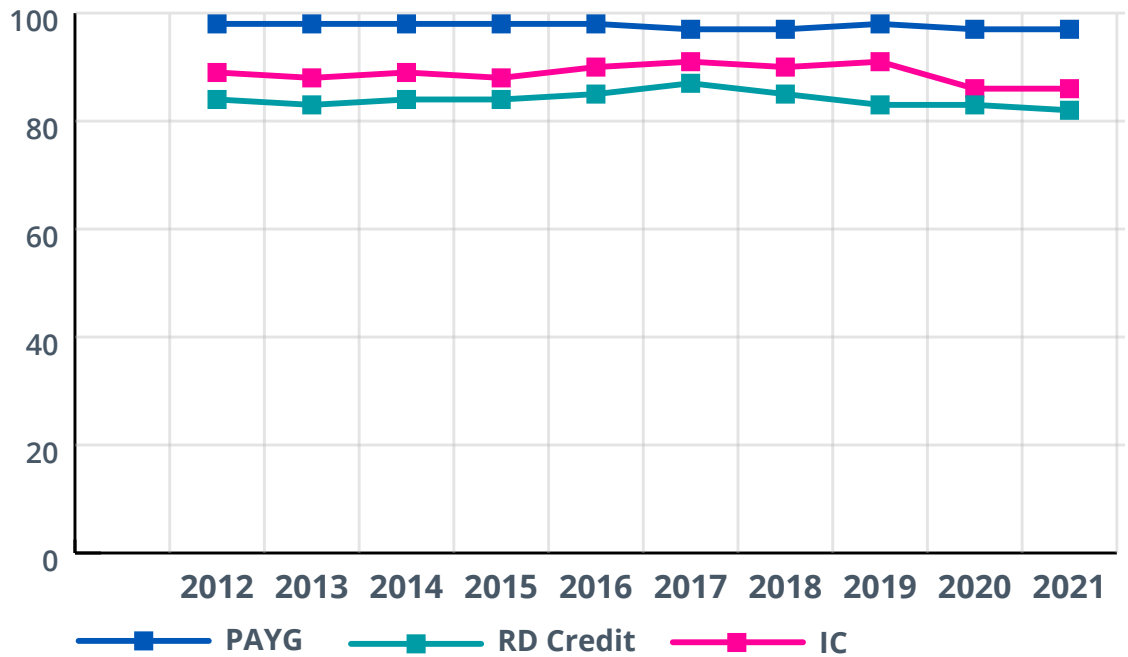
Table 8.1: Meter data services^{18 19}

	KPI	2017	2018	2019	2020	2021
Forecasting, Allocation and Reconciliation (FAR) – Domestic Reconciliation (PPM Meters - 12 month Rolling)	80% within 1,250 kWh	99.33%	99.32%	99.38%	98.72%	99.10%
Forecasting, Allocation and Reconciliation (FAR) – Domestic Reconciliation (Credit Meters - 12 month Rolling)	80% within 1,250 kWh	91.94%	92.37%	88.98%	89.85%	87.91%
Forecasting, Allocation and Reconciliation (FAR) – IC Reconciliation (12 month Rolling)	80% within 4,500 kWh	77.27%	75.49%	74.82%	69.62%	67.48%

¹⁸ Gas Meter Services | Gas Networks Ireland

¹⁹ The I&C annual quantity band ranges between 73,000 kWh and 5,550,000 kWh. The magnitude of reconciliation can vary significantly at I&C sites given the wide range of annual gas consumption.

The following chart plots the percentage of reconciliations within 10% of annual quantity over the past 10 years up to and including 2021. Performance over this period has been stable apart from the drop in 2020 and 2021 outlined above.



8.6 Provision of shrinkage gas quantity/costs estimates

'Shrinkage gas' is used to operate the system (own use gas) and to replace gas which is lost or unaccounted for. Gas Networks Ireland buys shrinkage gas to ensure the safe and efficient operation of the system and enters into one or more contracts for shrinkage gas.

Prior to October 2020, the transporter recovered the cost of shrinkage gas for the transmission system from shippers (by reference to throughput). From October 2020, shrinkage is included in tariff calculations.

For distribution shippers that are not subject to an additional network code charge for shrinkage, there is a distribution shrinkage factor included in the tariff. Shrinkage charges are paid by shippers, on a pro-rata basis, based on throughput (their entry and exit allocations).

Imbalance charges are paid to or by shippers depending on whether they have positive or negative imbalances. Overrun charges are charges payable by shippers where their allocations exceed their relevant active capacity on a day.

8.7 Maintenance days interruptions

Gas Networks Ireland operates, maintains and repairs the transportation system in accordance with the provisions of the Code²⁰. Maintenance days are days nominated by Gas Networks Ireland where part of the transportation system may be subject to maintenance. During maintenance days, natural gas available for offtake from that part of the transportation system may be reduced. The maintenance programme for the 2020/21 gas year was selected and presented to shippers for consultation in June 2020 and accepted for the 2020/21 gas year. From time to time additional unscheduled

maintenance may need to be conducted due to unforeseen circumstances as considered necessary in order to ensure the operational integrity and security of the transportation system. Notice will be given to each affected shipper as soon as is reasonably practicable, recognising that such maintenance is unscheduled.

For the 2020/2021 gas year Gas Networks Ireland informed the shippers of two planned maintenance days affecting the Corrib entry point only prior to the gas year commencing. These dates were as follows:

Date	Duration	Entry Point
19th May 2021	1 day	Corrib
8th September 2021	1 day	Corrib

Through enhanced preparatory work and coordination with the connected system operators Gas Networks Ireland did not need to curtail gas flows over any of these days.

Bellanaboy Entry Point on seven occasions for a total of approximately 109 hours. There were no instances during 2020/21 gas year where Gas Networks Ireland constrained gas flow at the Bellanaboy Entry Point.

In 2020/21 gas year the Bellanaboy Bridge Gas Terminal operator curtailed flow into the Gas Networks Ireland system from the

The were no interruptions to the Moffat entry point in the year.

²⁰ Part G, section 5, Code of Operations

9 Distribution System

Gas demand in the DM I&C sector was 4% higher in 2021 when compared to 2020. This increase in DM I&C demand reflects the growth in the number of DM I&C connections of 7.8%.

NDM sector gas demand is highly sensitive to weather. Based on a Degree Day (DD) comparison, the winter of October '20 to March '21 was slightly warmer than the previous year, with a decrease of 0.4% in the number of DDs. Similarly, overall, 2021 was 0.3% warmer than 2020 based on a DD comparison. Gas demand in the NDM sector was approximately 1% lower in 2021 in comparison to 2020. When weather correction is taken into account, an increase of 0.5% in NDM sector gas demand is observed. This slight increase in NDM sector demand is related to the increase of 1% in the number of NDM connections in 2021 vs. 2020.

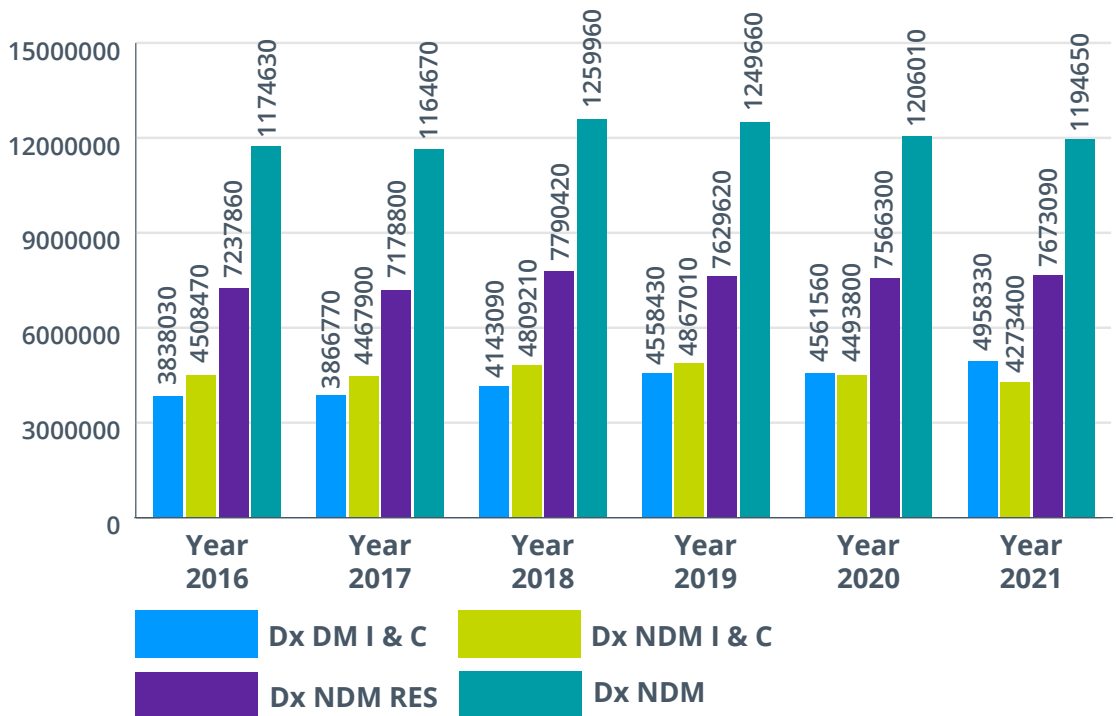
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In the NDM I&C sub-sector, demand was down by 7.3% in 2021 compared to 2020. When weather correction is considered, this decrease in NDM I&C demand reduces to 5.2%. In the residential

NDM sub-sector, there was an increase of 3.2% in gas demand. Allowing for weather correction, demand in this sector increases by 4% in 2021 vs. 2020.

Figure 9.1: Distribution system data

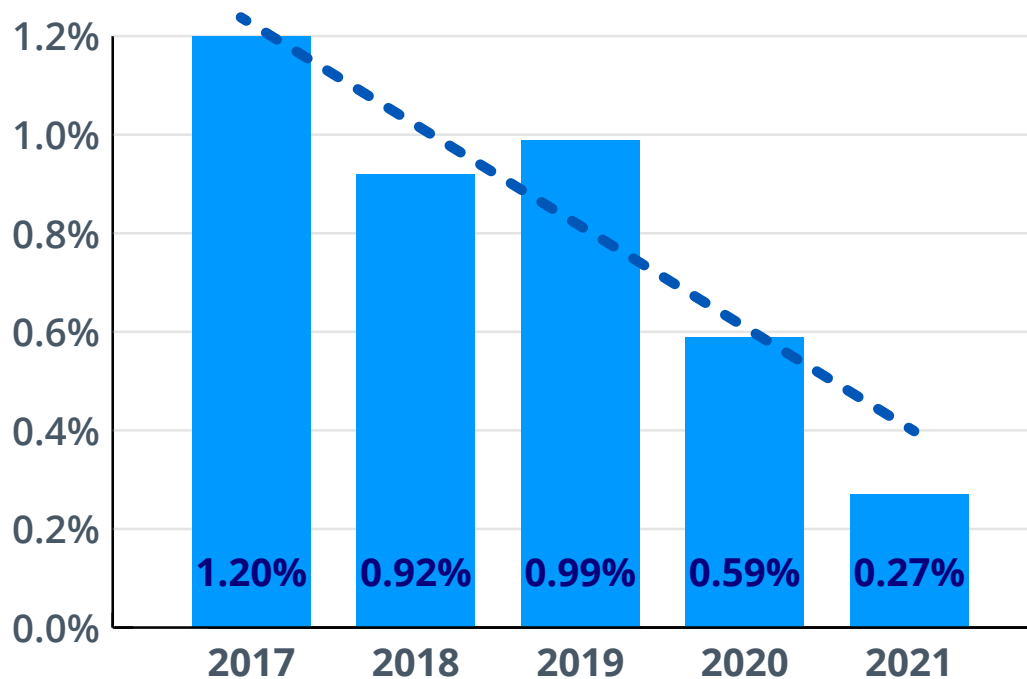


9.1 Distribution UAG

Unaccounted for Gas (UAG) on the distribution network represents total unallocated distribution gas. Distribution UAG causes include network leakage, gas escapes, theft of gas, gas quality variation, long-term no access and unregistered consumption. Distribution UAG is calculated, as agreed with the CRU, using a metering by difference formula²¹ on a rolling 12-month basis. Distribution UAG as percentage of total distribution throughput in 2021 was

0.27%²². The Distribution UAG percentage for 2021 was significantly lower than previous years. This is primarily as a result of the continuing efforts of the Distribution UAG project team and the various initiatives they have undertaken to reduce DX UAG, including updating of the National Meter Correction Factor. However, it is as yet unknown how Covid-19 and the associated restrictions that impeded on meter reads may also have impacted distribution UAG.

Figure 9.2: Distribution UAG (%)



²¹ Distribution UAG formula: $UAG = \frac{\text{distribution throughput} - \text{LDM \& DM consumption} - \text{read NDM consumption} - \text{un-reconciled NDM allocations}}{\text{total distribution throughput}}$; 12 month Rolling Average as of end of December 2021.

9.2 Total number of connections (by category)

The total number of distribution connections in 2021 stands at 715,093. This is up by 0.7% on 2020. The largest increase

was in the DM I&C sector experiencing a rise of 7.8% from 2020 as previously mentioned; see Table 9.2 below.

Table 9.2: Distribution connections by category

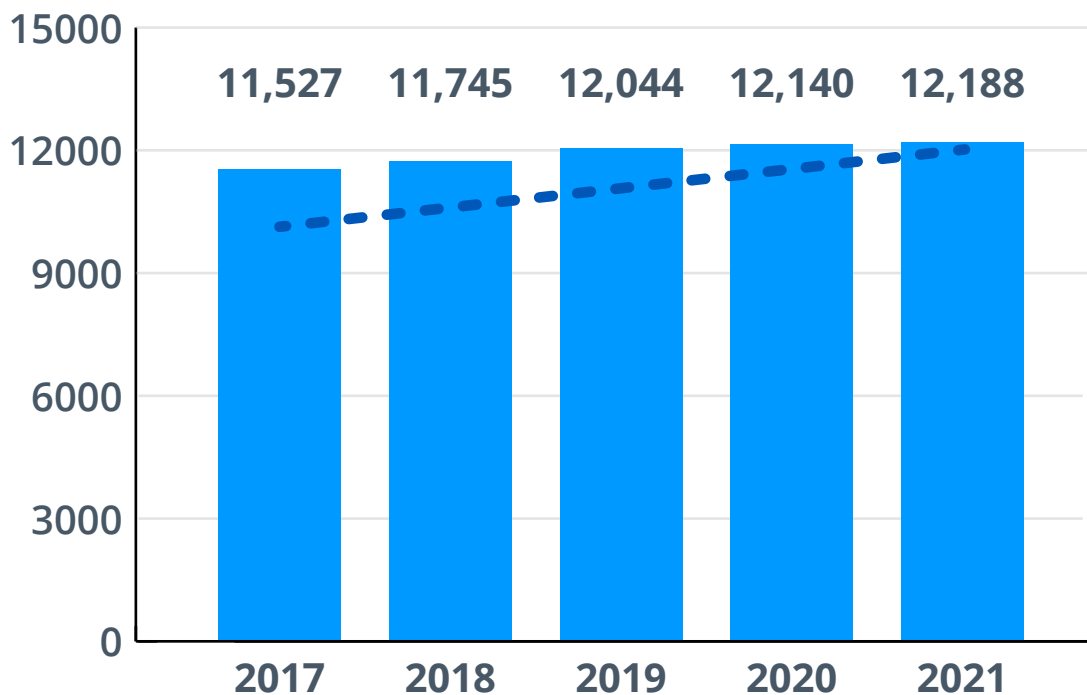
Connections	2017	2018	2019	2020	2021	% Change from 2020
Dx DM I&C	232	230	236	243	262	7.8%
Dx NDM I&C	25,993	26,256	26,482	26,845	27,025	0.7%
Dx NDM Res	657,638	667,340	675,728	682,980	687,806	0.7%
Dx Total	683,863	693,835	702,446	710,068	715,093	0.7%

9.3 Total length of pipe in the distribution system

The distribution network operates in two tiers; a medium pressure and a low pressure. The distribution network is predominantly polyethylene pipelines. As residential and business premises are added to the network, the length of pipe in

the distribution network grows. The length of the distribution network at the end of 2021 is measured at 12,188 km. This has been growing incrementally in the last five years as shown below in Figure 9.3.

Figure 9.3: Distribution system length (km)



9.4 Achievement of distribution capital programme

As part of the price control process, the CRU and Gas Networks Ireland agree a 5-year programme of capital works for the distribution network. Gas Networks Ireland is currently in its fourth regulatory price control Period (PC4), from October 2017 to September 2022. See Section 6.0 Achievement of Capital Programme for further detail.

Illustrated on the next page are some 2021 high volume programmes; the percentage of completion represents the percentage scope completed for the project versus the target for PC3 or PC4, as appropriate.

Examples of projects undertaken as part of the distribution capital programme are:

- Replacement of meters at domestic locations and I&C locations which are 20 years old or older; Upgrading works to bring distribution installations sites into compliance with the ATEX Directive.
- Remedial works at multi-occupancy buildings with more than six gas points.



Figure 9.4: Distribution capital programmes

G4 Domestic Meter Replacement Programme	79% complete
I&C Meter Replacement Programme	Design 55% & Replacement 31%
G10 Meter Replacement	Design 50% & Replacement 31%
PE in Porches	Design 100% & Replacement 91%.
Dx AtEx Compliance	99% complete
Lithium Battery Replacement Programme	59% complete
Multi Occupancy Buildings – Phase 1	Desktop - 100%
	Site survey – 100%
	Detailed design – 56%
	Construction – 40%

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9.5 Reinforcement

Reinforcement works completed in 2021 are listed below.

- Kimmage Road Lower
- Railway Street, Cork City
- Jamestown Business Park Reinforcement

- Thormanby Lawns – Branch saddle completed in 2021 from works left over from 2016
- Portlaoise

In addition, reinforcement works began at Carrig Tur Ballincollig, which is expected to be completed in 2022.

9.6 New connections during year (by category)

Connections to the Gas Networks Ireland natural gas network are split into four (4) main sectors as follows:

- Large Industrial and Commercial (LIC)
- Small and Medium Enterprise
- Residential – New Housing
- Residential – Mature Domestic

Following the challenges of the global Covid-19 pandemic in 2020, new connections efforts during 2021 focused on supporting some element of recovery in the SME sector business, growth in mature domestic sector and providing Ireland's largest energy consumers with a reliable, secure, cleaner and cost effective supply of fuel to meet their energy requirements. On the back of the Climate Action Plan and subsequent Climate Action Bill, driving the move away from fossil fuels and supporting a ban on fossil boilers in new dwellings, meter fits in the new residential sector (new housing) reduced significantly again in 2021 as the majority of builders and developers move away from natural gas to electric heat pump technology. However, the multi-occupancy building (apartments) sector thrived in 2021 with

12 contracts secured for central boiler solutions providing heating and hot water to 2,864 apartments in combination with other technologies such as combined heat and power (CHP), heat pumps and/or solar PV panels. This sector continues to rely on natural gas solutions in conjunction with renewable technologies to meet the Part L of the Building Regulation standards.

The Large I&C sector experienced significant growth in demand for natural gas supply to provide power generators, data centre operators, pharmaceutical and public sector developments with a reliable, versatile, secure and cost-effective fuel to meet their energy requirements.

Gas Networks Ireland received multiple power generation enquiries during 2021 and also secured its first transmission connection contract for a power plant in over 10 years. The sales funnel also increased dramatically this year with data centre enquiries flooding towards GNI to connect to the natural gas network due to critical shortages in capacity in the electrical grid.

The SME sector struggled in 2021 on the back of continuing Covid-19 restrictions during the first half of 2021 and ongoing financial challenges across multiple SME sub-sectors. The hospitality sector was the worst impacted by the restrictions and, during 2021, did not appear to fully recover. While commercial meter-fits decreased in 2021 compared with 2020, the numbers of orders increased by c. 3%, however these figures were significantly lower than 2019 and previous years illustrating the challenging market facing Gas Networks Ireland in this sector. Availability of financing among SMEs and confusing messaging around energy efficiency and decarbonisation of energy use is causing SMEs to consider options in terms of their energy source.

The mature housing sector also faced challenges in 2021 due to continuing Covid-19 restrictions and the continued impact of competition from heat pumps which benefit from SEAI grant support giving them a competitive advantage. While meter-fits in this sector increased modestly between 2020 (3,408) and 2021 (3,513), new meter orders in this sector experienced a more significant increase of 12% over the same period.

As can be seen from the graph below, the overall meter-fit numbers and meter sales are in decline as meter-fits in the traditional new housing sector reduce on the back of the switch to electric heat pumps outlined above and meter orders in this sector trend to zero based on the upcoming ban on fossil boilers in new dwellings by 2023.

Figure 9.5: New Connections meter-fits by category

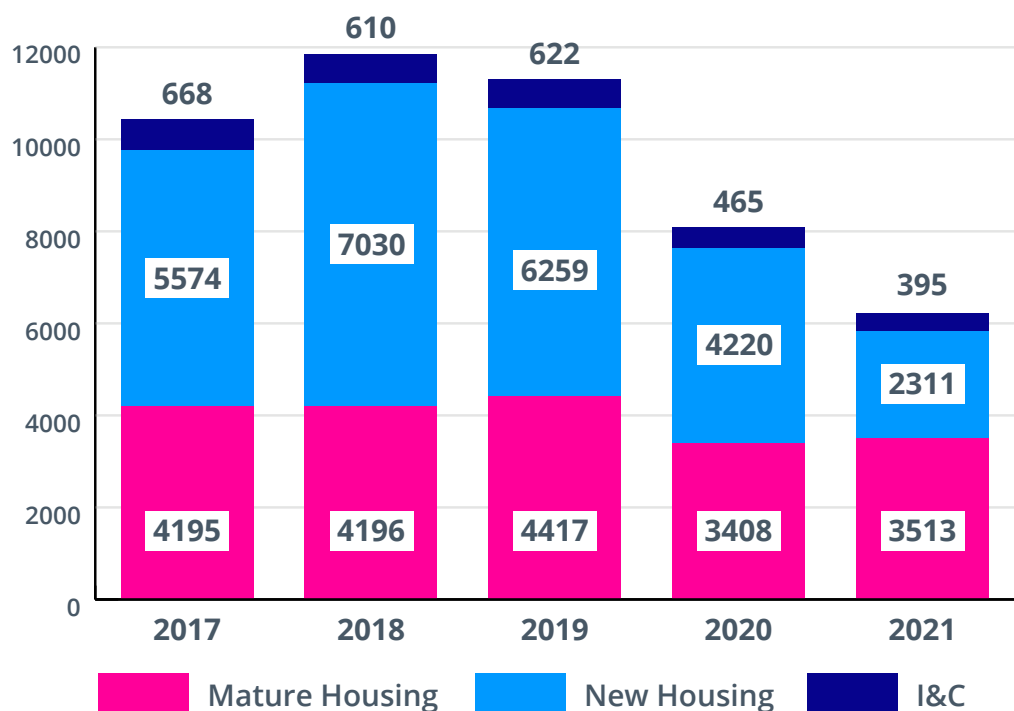
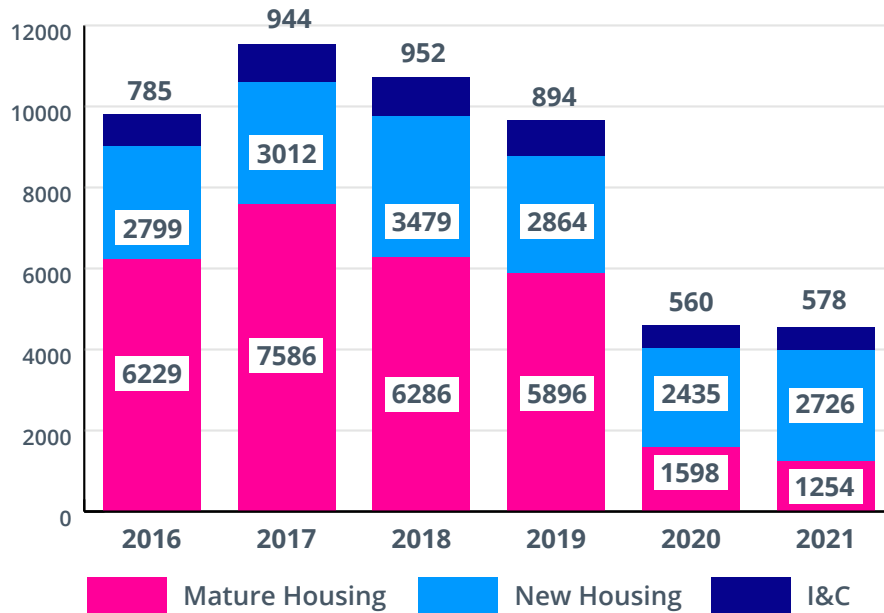




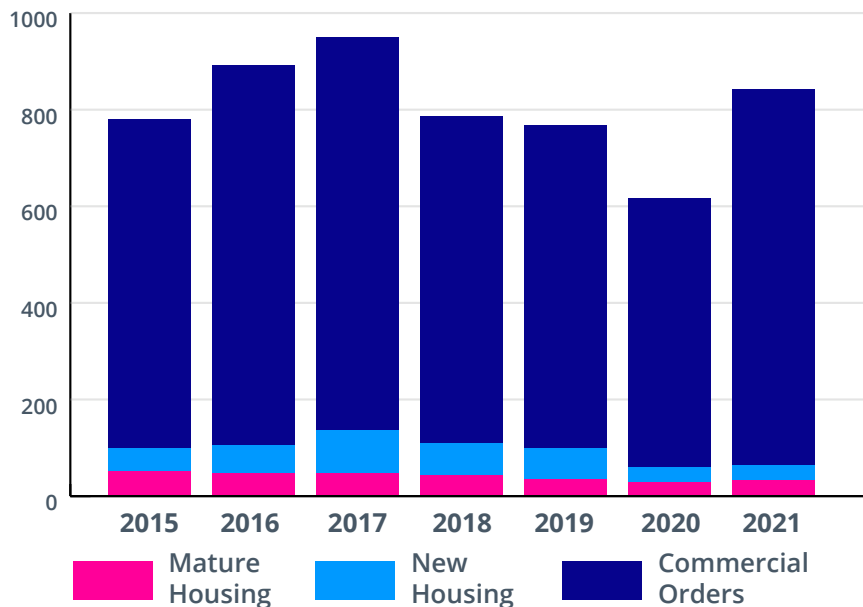
Figure 9.6: New Connections meter sales by category



The volumes contracted across all sectors reduced between 2017 and 2021, as can be seen in the graph below. However, these are now on the increase as the demand from large industrial & commercial, power

generation and data centre developments increase as a result of gas (including future renewable gas and hydrogen) remaining a critical part of the energy solution among these large energy users.

Figure 9.7: New Connections volumes contracted by category



9.7 Update on new towns receiving gas

Gas Networks Ireland continually brings the benefits of natural gas to new customers and new towns across the country, with natural gas now widely across Ireland. The Connections Policy, a Gas Networks Ireland document approved by the CRU, facilitates high level objectives that encourage the connection of new customers, offers transparency around charges, treats connections consistently and minimises the impact on tariffs. The more customers that are connected to the gas network, the more throughput on the system, which in turn reduces the tariffs for the benefit of all gas customers.

Gas Networks Ireland actively promotes natural gas as a fuel of choice for homes, businesses and industry, encourages greater utilisation of the natural gas network and looks for opportunities to expand the network where economically viable. Towns connected to the gas network have a significant competitive advantage over towns without a natural gas network. Sales and marketing efforts continued in Listowel, Wexford, Nenagh and Ballymahon during 2021, restricted only by the continuing Covid-19 government restrictions, and significant commercial orders were secured as a result of these ongoing efforts.

Across Europe, satellite gas networks have been established remote from the main gas network with supply from Compressed Natural Gas (CNG) services.

These networks exist along with direct supply to large commercial or industrial facilities and Gas Networks Ireland is looking to support rural regions and remote industries across Ireland wishing to decouple their energy requirements from carbon intensive oil and LPG. Access to natural gas will provide access to combined heat & power technology as well as maturing biogas markets. Furthermore, in combination with the integration of local/indigenously produced biomethane these satellite towns and industries can assist in decarbonising agriculture and food processing industries, and also contribute to renewable energy target commitments, particularly in heat and transport.

As a demonstrator of this model, Gas Networks Ireland continued to work with Sligo Sustainable Energy Community to ascertain the potential viability of a satellite gas network connecting cluster(s) of large energy users in the town and supplying the network with both compressed natural gas from the main gas network and local/regionally produced biomethane. The efforts are continuing now with a comprehensive assessment of the local potential for biomethane production from agricultural, marine, and municipal resources and residues. This project is supported by Gas Networks Ireland through collaborative assistance and co-funding from the Gas Innovation Fund.

9.8 Innovation and new technologies

Compressed Natural Gas (CNG)

Four public access CNG refuelling stations, up from 2 in 2020, are now operational in Ireland, located at Circle K's Dublin Port Cashel, Ballysimon and Clonshaugh forecourts. All of these stations are operated by Circle K and have a capacity to refuel up to 50 vehicles per day. These four stations form part of the initial network of 14 public stations being developed as part of the Causeway Study for which Gas Networks Ireland has received co-funding from the European Commission, under the Connecting Europe Facility Transport Fund, and the CRU Innovation Fund. Gas Networks Ireland also delivers infrastructure to private fleet operators and hauliers – there are currently three medium-sized private CNG stations operational in Ireland. In early 2021, Gas Networks Ireland completed the construction of a large CNG station in Virginia in Cavan.

Planning permission has been obtained for what will be Gas Networks Ireland's first owned and operated biomethane central grid injection facility, to be developed at a site in north Cork. Once fully operational, this facility will have the technical capacity to inject up to 700 GWh of biomethane per annum, which will be produced at anaerobic digestion facilities in its catchment area; enough renewable gas to supply green energy to approximately 64,000 homes. It is estimated that, at maximum capacity, the Mitchelstown operation could reduce Ireland's annual harmful CO₂ emissions by up to 170,000 tonnes per annum; 27,000 tonnes of which will be made up from agricultural emissions

LNG Import Terminal Entry Point Enquiries

Gas Networks Ireland has received entry connection enquiries from three parties that wish to connect liquified natural gas (LNG) import terminal facilities to the gas network. Gas Networks Ireland is progressing advance works agreements with these parties to

determine scope of works, programme for work and order of magnitude cost estimate for the facilities to connect the proposed LNG import terminals to our gas network.

Hydrogen

In July 2021, the CRU approved Gas Networks Ireland's request to spend an otherwise unassigned €2,485,000 of innovation funding on a programme of work focusing on preparing the gas network for the safe and timely transition to hydrogen. This programme would enable the development of a roadmap for hydrogen and to progress the necessary work on hydrogen related projects. This roadmap is the first step to prepare for hydrogen and is a critical development to assess the impacts of hydrogen injection across Gas Networks Ireland's safety case, business processes and other legal, regulatory and financial areas.

Work on the safety case review commenced, with Pipeline Integrity Engineers Ltd being procured to complete a number of deliverables. These included a technical report, a technical strategy and a process implementation report which have all been delivered. Further work is planned for 2022 to deliver a site selection framework for a distribution hydrogen blending trial. Gas Networks Ireland also undertook a technical feasibility study on introducing a 20% blend of hydrogen into a local gas distribution network in the Cork area. This included an assessment of both new and existing infrastructure.

In addition, during 2021, Gas Networks Ireland opened the Networks Innovation Centre in West Dublin. This facility is independent of the gas network and will be used to assess the potential to transport hydrogen blends in the existing gas network. Gas Networks Ireland also commenced a joint project with UCD, developing and conducting tests that demonstrate the safe operation of natural gas appliances and aspects of the gas network using blends of natural gas and hydrogen. The project commenced in August 2021 with the appointment of Ali Ekhtiari as the PhD Researcher for the project under Professor Eoin Syron of UCD.

In December 2021, Gas Networks Ireland stood up its Hydrogen Technical and Safety working group. This working group will be key to coordinating and progressing activities set out in the technical and safety workstreams of the hydrogen programme. Work is underway to stand up both a Hydrogen Policy, Legal, Finance & Regulatory Working Groups and a Hydrogen Strategy & Commercial Working Group which will advance activities under the other programme workstreams.

Gas Networks Ireland developed an external facing document “Hydrogen and Ireland’s National Gas Network”. This document provides a high-level overview to interested parties of the current gas regulations and plans around hydrogen. It outlines the main areas that will need to be addressed and actions required in order to facilitate the injection, transportation and storage of hydrogen on the gas network in Ireland.

Finally, Gas Networks Ireland began engagement with a number of key national research groups and projects including Hydrogen Ireland, Hydrogen Mobility Ireland, Hylight and H-Wind, and commenced a number of collaborative projects with TSOs and DSOs across Europe.

10 Distribution Gas Safety

10.1 Overview of Gas Safety

Safety performance is a core value and top priority for Gas Networks Ireland. It underpins the company brand and its reputation of being a trusted and responsible gas infrastructure company. The network is constructed, operated and maintained to the highest international safety standards, in line with the CRU policies. The primary function of the network is to transport gas from entry to exit, on behalf of all customers, while

ensuring the network is operated safely and efficiently. This is achieved using sophisticated information systems and grid controllers monitoring the system 24/7. The structure ensures that pressure is maintained within the system, alarms are responded to and escalated in a timely manner, the quality of the gas meets regulated requirements and that processes and procedures are in place to manage a natural gas emergency, should it occur.

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Compliance with national safety legislation including implementation of “a Safety Regulatory Framework for Natural Gas” is core to the operation of the business. The Gas Networks Ireland Distribution Safety Case, Rev. 4 was accepted by the CRU in October 2019. It demonstrates the Gas Networks Ireland arrangements for managing the distribution network. This is delivered through adherence to well established Irish and international codes and standards, reflected through internal processes and procedures. Gas Networks Ireland’s management systems are accredited as follows:

- ISO 45001 for safety management;
- ISO 14001 for environmental management;
- ISO 9001 for quality management;
- ISO 55001 for asset management; and
- ISO 50001 for energy management.

In 2021 all five of our individual ISO systems underwent a successful integrated surveillance audit by the National Standards Authority of Ireland. This was the first time that the NSAI have audited five management systems at once and in July 2021, Gas Networks Ireland was named as the winner in the ‘Utilities’ category at the Health and Safety Excellence Awards 2021.

Gas Networks Ireland has an excellent record in meeting all its safety, statutory and regulatory obligations. Its average response time to the 14,646 public reported gas escapes (PREs) received in 2021 was 29 minutes, well within the target of 1 hour. Gas Networks Ireland is committed to ensuring that all gas technical and operational personnel have the necessary levels of experience, knowledge and skills appropriate to their range of duties.

10.2 High level safety objectives

1. Minimising the Risk of Loss of Containment

Gas undertakings are required to demonstrate that they have suitable management systems and

procedures in place for managing the risks that lead to, and arise from, loss of gas containment events.

2. Maintaining Safe System Operating Pressure

Gas undertakings are required to demonstrate that they have suitable management systems in place; for

managing the risks that can result in dangerously high, or low gas operating pressure in the pipeline system(s).

3. Minimising the Risk of Injecting Gas of Non-Conforming Quality

Gas emergency incidents can arise due to gas of inappropriate quality being injected into the system. Gas undertakings are required to demonstrate that they have

suitable management systems in place; for gas quality monitoring and managing the risks associated with the quality of gas that is injected into the system.

4. Providing an Efficient and Coordinated Response to Gas Emergencies

Gas emergency events can and do occur for a variety of reasons including the actions of third parties. For example, Gas Networks Ireland is required to demonstrate that it has suitable arrangements in place for: (i) managing the response to 'localised' gas emergencies; and (ii) undertaking the role of National Gas Emergency Manager

(NGEM) during 'network' gas emergencies. Additionally, all natural gas undertakings are required to demonstrate that they have suitable arrangements in place for responding to the requirements of the NGEM, in the event of large-scale 'network' gas emergencies being declared.

5. Minimising the Safety Risks Associated with the Utilisation of Gas

The Framework provides for a comprehensive regime relating to the regulation of gas installers. The key aim of this regime is that all categories of 'gas works' designated by the CRU are only

undertaken by competent gas installers, who are registered, and subject to ongoing regulation and inspection, by the Gas Safety Supervisory Body appointed by the CRU.

6. Promoting Public Awareness of Gas Safety

The Framework places duties and obligations on both individual gas undertakings and the industry generally for the promotion of gas safety awareness. This involves a combination of both individual and coordinated safety promotional activities.

Gas Networks Ireland submits quarterly reports to the CRU under the gas safety regulatory framework. The report includes measures and statistics that have been under continuous monitoring and improvement during the year.

10.3 High level distribution safety statistics

Table 10.1: High level gas safety statistics²²

Ref	Subject	High level KPI	2017	2018	2019	2020	2021
1A	Public Reported Escapes	Number of External Leaks Detected	3,498	3,534	3,456	2,771	2,732
		Number of Internal Leaks Detected	3,712	3,771	3,771	3,758	3,713
1C	Third Party Damage	No. of Main Damages	107	89	122	82	64
		No. of Service Damages	457	461	528	401	339
1D	Gas in Buildings	Number of 'Gas in Buildings' events (i.e. all gas ingress from external infrastructure)	0	0	1	1	2
2B	Gas Outages	15 Customers affected	0	0	5	0	2
		100 Customers affected	0	0	1	0	2
4A	Public Reported Escapes	% attended within one hour	99.91	99.3	99.9%	99.96%	99.94%

²² In 2021 Gas Networks Ireland responded to 14,646 PREs. In many cases there is no trace of gas. The figures illustrated in Table 10.1 are the actual number of leaks detected



Ref	Subject	High level KPI	2017	2018	2019	2020	2021
4B	Gas Supply Emergencies	Local Gas Supply Emergencies 1,000 - 9,999 affected	0	0	0	0	0
		NGEM Emergencies - >10,000 customers affected	1	0	0	0	0
5C	Incidents (Occurring on Gas Network)	Reportable under Gas Legislation	0	0	0	2	0
5D	Incidents (Occurring on Gas Network)	Reportable under CRU Guidelines	5	3	6	2	5
5E	Incidents (Occurring on Customer installations)	Reportable under Gas Legislation	1	0	1	1	5
5F	Incidents (Occurring on Customer installations)	Reportable under CRU Guidelines	2	8	3	3	5
4D	Emergency Reports	Total no. of calls received via the 24hour emergency telephone number (1800 20 50 50/ 1850 20 50 50)	25,107	30,131	27,006	26,960	26,956

Ref	Subject	High level KPI	2017	2018	2019	2020	2021
		Total enquiries to 1800 427/ 747/ 1850 427 747 (inward communication)	1,610	1,565	1,420	962	1,071
		Total enquiries to distribution					
6A	Third Party Damage	DBYD26 email/ post/fax/ calls (inward communication)	5,939	8,088	13,022 ²³	2,777	2,828
		Total responses from DBYD Online	N/A	N/A	N/A	16,656 ²⁴	19,148
		Total inward enquiries	7,549	9,653	14,442	20,395	23,047

23 The figure of 13,022 includes 8,914 enquiries to the “traditional” email/ fax/ phone Dial Before You Dig service plus 4,108 plots generated via the online Dial Before You Dig system which launched in Q3 (soft launch) and Q4 (public launch). Online DBYD figures measure the number of plots generated. Email/ fax/ post figures measure the number of enquiries (an individual enquiry may result in several plots being generated). 2019 figures cannot therefore be directly compared with historical figures.

24 From 2020, Gas Networks Ireland has reported on outward responses from the Dial Before You Dig online service. On the online system, each individual response (plot) is counted whereas for enquiries received by email, phone or fax it is the enquiry that is counted, regardless of how many plots are requested/ issued.

10.4 Public reported escapes

There were 14,646 Public Reported Escapes (PREs) related to leaks on the Gas Networks Ireland distribution network in 2021.

This is a decrease from the 14,928 PREs reported in 2020. In approximately 56%

of these cases, no trace of gas was found.

In most cases where gas was detected, the leaks were minor in nature and were made safe by Gas Networks Ireland technicians using standard methods.

10.5 Distribution safety performance

There was a consistently high safety distribution performance in 2021, a brief summary is outlined below:

- 2 gas in building events
- 4 unplanned outages in 2021
- 0 gas supply emergencies.

10.6 Promoting public awareness of gas safety

Gas Networks Ireland operates a 'digital 'Dial Before You Dig' mapping service. The online service, which complements the existing Dial Before You Dig phone and email service, ensures it is easier than ever to check whether there are underground gas pipes on a site before commencing work. The new service resulted in a notable increase in the number of third party enquiries generated. This is partly due to a difference in the way that the online system measures usage (the online system plots generated whereas the phone/ post/ email system measures enquiries received which may, in fact result in several plots being generated). At the end of 2021, there were 4,173 registered users of the system, up from 2,487 at the end of 2020.

Gas Networks Ireland promotes its Dial Before You Dig service to a wide range of people and organisations involved in construction, utilities, farming and forestry via digital, social media and trade press advertising.

Gas Networks Ireland continued to promote its gas emergency service to gas consumers and the general public via a multimedia advertising campaign in 2021. Due to ComReg changes to Non-Geographic Numbers (NGN) Gas Networks Ireland changed all of its external telephone numbers in 2021, including the emergency line. The majority of these numbers were

changed to their 1800 equivalents. In some cases, new numbers had to be adopted as the 1800 equivalents were already in use. The Gas Emergency Service changed to 1800 20 50 50. 1850 numbers were turned off in early 2022, however utility emergency and safety-related numbers remain in operation until at least November 2023 by arrangement with ComReg. A new public safety advertising campaign was produced and launched in 2021 to communicate the steps to take and the new number to call in the event of smelling gas. The total number of calls received via the 24-hour emergency telephone number (1800 20 50 50/ 1850 20 50 50) in 2021 was 26,956. By the end of December 2021, 65% of calls received were made on the new 1800 number.

The multi-award winning Gas Networks Ireland carbon monoxide advertising campaign continued during 2021 and received a refresh in the form of a new ad, utilising the same "Tommy McAnairey" canary character promoting the importance of regularly testing carbon monoxide alarms.

Also in 2021, Gas Networks Ireland launched a new campaign aimed at tackling gas meter tampering. The campaign focuses on the risks associated with tampering and encourages anyone who has concerns about gas meter tampering in their area to contact Gas Networks Ireland.

10.7 Addressing gas meter tampering

Established in 2013/14, Gas Networks Ireland's Revenue Protection Unit is tasked with the detection and prevention of gas theft and unauthorised interference with gas metering equipment and pipework. The Revenue Protection Unit also raises awareness of the dangers of gas meter tampering and the associated risk to life through targeted media campaigns.

In the interest of safety, the installation, removal, repair, service, maintenance or replacement of natural gas fittings and appliances within a premise are only to be carried out by Registered Gas Installers (RGI). It is a requirement for all RGIs to issue a certificate of conformance (completion certificate) in respect of gas works carried out.

Each year a meter tampering public awareness campaign is run by Gas Networks Ireland and is focused on key times throughout the year. It aims to drive awareness of the dangers of meter tampering. This campaign typically includes digital, social, direct and outdoor media.

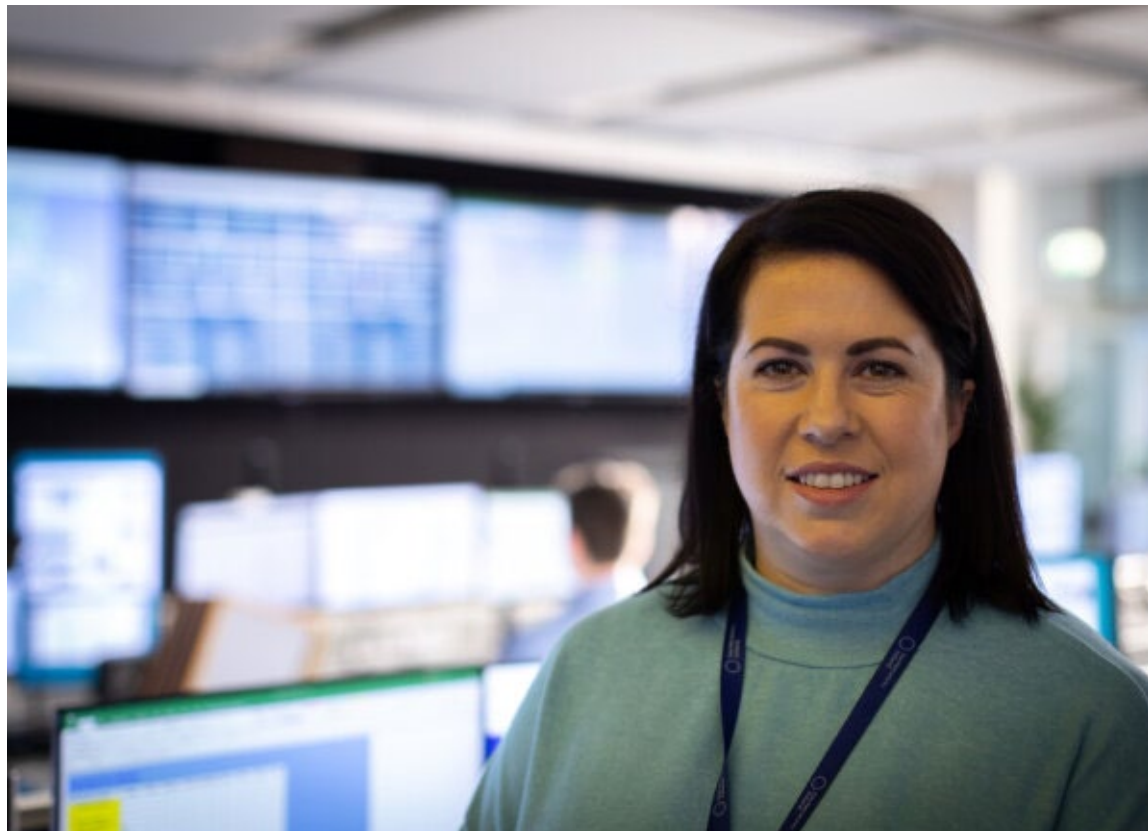
Gas Networks Ireland developed and launched a new public awareness campaign during 2021 highlighting the life-threatening risks posed by illegal gas meter tampering. 'Tampering with your gas meter is just as risky' campaign compares gas tampering to other high-risk scenarios to educate the public on its dangers and advise the appropriate actions to take if they believe meter tampering is taking place in their local area. The campaign primarily focuses on neighbourhoods that have been identified with high incidences of meter tampering. The target audiences are gas customers, their neighbours and members of the public with an emphasis on key urban areas. In excess of 235,000 leaflets were distributed throughout 2021 to gas customers.

One of the primary roles of the Revenue Protection Unit is taking prosecutions against individuals it suspects of committing an offence or offences under the Energy (Miscellaneous Provisions) Act 2012. In 2021, Gas Networks Ireland brought successful prosecutions in six cases, by identifying gas theft and prosecuting individuals in the district courts for unlawful interference, including securing its first commercial conviction against a public house in Carlow town, for interference with a gas supply. The company was convicted under three separate sections of the Energy Act and fined €2,000. This is the first case Gas Networks Ireland has taken in the industrial and commercial sector since the commencement of the Revenue Protection Unit.

Our site investigations are another key focus for the Revenue Protection team. This process runs in parallel with, but separate to, the prosecution process to identify meters that may be subject to interference. Following investigations, 182 sites were confirmed as tampered in 2021. To date, over 2,900 meters have been identified as tampered and been subject to this process.

11 Conclusion

2021 was an unusual year for Gas Networks Ireland, as it was for businesses everywhere. Gas Networks Ireland's ability to deliver key asset programmes and essential services to shippers and customers continued to be severely curtailed in 2021 because of the protracted lockdowns due to the global Covid-19 pandemic. In spite of these challenges, Gas Networks Ireland was able to meet all KPIs related to the performance of the system.



Demand in 2021 of 56,259GWh was slightly down on the 2020 figure of 57,886 GWh. Again, as in previous years, the supply of indigenous gas from Corrib decreased requiring an increase from the UK through the Moffat entry point. This increase had a knock-on impact on gas fuel usage by Gas Networks Ireland to operate the compressors in South West Scotland, which grew by approximately 2.5%. The supply of indigenous gas fell from 36% of the total in 2020 to 28% of the total in 2021.

An area that Gas Networks Ireland had focused on over the past number of years was growing the number of residential connections, especially to existing dwellings close to the network. It was estimated that this could add an additional 300,000 new residential connections. This initiative however slowed following the publication of the Climate Action Plan in 2019 and its proposed ban on boilers in domestic settings

Gas Networks Ireland is looking at innovative ways to deliver Ireland's low carbon energy future with targeted initiatives such as compressed natural gas for transport and renewable gas already underway. Furthermore, Gas Networks Ireland has commenced analysis of hydrogen blends and developed a test facility at its Network Innovation Centre in Brownsbarn, Dublin, in preparation for the gas network's safe and timely transition to hydrogen.

Safety remained a top priority for assets and operations throughout 2021. Gas Networks Ireland has an excellent record in meeting all its safety, statutory and regulatory obligations. There were 14,646 Public Reported Escapes (PREs) related to leaks on the Gas Networks Ireland distribution network in 2021 (a decrease of 1.9 % on the 14,928 PREs reported in 2020). In approximately 56% of these cases, no trace of gas was found. In the vast majority of cases where gas was detected, the leaks were minor in nature and were repaired by Gas Networks Ireland technicians using standard reactive maintenance and repair methods. Gas Networks Ireland's average response time was 29 minutes, within the response time target of 1 hour. Gas Networks Ireland remains committed to delivering the highest safety standards, while operating in an environmentally friendly manner, ensuring that gas is used to power homes, businesses and essential services throughout Ireland, 365 days a year, regardless of the weather and demand challenges that are placed on the system.

12 Appendices

12.1 Glossary of Terms

AGI Above Ground Installation	GP Gas Point
ALARP As Low as Reasonably Practical	GPRO Gas Point Registration Office
CRU Commission for Regulation of Utilities	GTMS Gas Transportation Management System
CES Customer Effort Score	GWh Gigawatt hour
CO Carbon Monoxide	LDM Large Daily Metered
CSO Central Statistics Office	LEL Lower Explosive Limit
DBYD Dial Before You Dig	LPG Liquefied Petroleum Gas
DM Daily Metered	MWh Megawatt hour
DSO Distribution System Operator	MOP Maximum Operating Pressure
Dx Distribution	N/A Not Applicable
FAR Forecasting, Allocation and Reconciliation	NDM Non-Daily Metered
IBP Irish Balancing Point	NGEM Natural Gas Emergency Manager
I & C Industrial & Commercial	NGEP Natural Gas Emergency Plan
I/C Interconnector	No. Number
km Kilometre	OBA Operational Balancing Account
KPI Key Performance Indicator	OGP Office of Government Procurement
kWh Kilowatt hour	PPL Planned Performance Level
GDP Gross Domestic Product	PPM Pre-Payment Meters
GIS Geographical Information System	PREs Public Reported Escapes
GMARG Gas Market Arrangements Retail Group	RES Residential

- RGI Registered Gas Installer
- RoI Republic of Ireland
- RuG Reportable under Guidelines
- SCADA Supervisory Control and Data Acquisition
- SEAI Sustainable Energy Authority of Ireland
- TPD Third Party Damage
- TSO Transmission System Operator
- UAG Unaccounted for Gas
- UKOPA United Kingdom Onshore Pipeline-operators Association
- ZIP Zero Imbalance Position

The main contact details for
Gas Networks Ireland are:

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General Enquiries

1800 464 464

Lines open Monday to Friday 8am – 8pm
and Saturday 9am – 5.30pm

.....
24 Hour Emergency Service

1800 20 50 50

.....
networksinfo@gasnetworks.ie

.....
X @GasNetIrl
gasnetworks.ie