marcogaz

Gas Distribution Performance Indicators Report

Anonymized version: no reference to countries

2011 to 2019

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Contact

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ABOUT MARCOGAZ

Founded in 1968, MARCOGAZ represents 28 member organisations from 20 countries. Its mission encompasses monitoring and policy advisory activities related to European technical regulation, standardisation and certification with respect to safety and integrity of gas systems and equipment, rational use of energy as well as environment, health and safety issues. It is registered in Brussels under number BE0877 785 464.

DISCLAIMER

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1. Introduction

MARCOGAZ initiated a project to define a standard set of performance indicators to apply to DSOs at European level.

These can relate to the growing interests of the European Commission and Regulators to define such indicators, especially in terms of quality of service, and to benchmark DSOs at European level.

Through comparing specific performance indicators across European Gas Distribution System Operators (DSO's), this study shows that safety, quality and security of supply indicators have been shared by all distributors and are under control.

Differences mainly related to the history of networks exist, but quality levels are comparable between countries.

2. Objective

2.1. Scope and limits

The purpose of this report is to give an overview on how DSOs deal with their major challenges (safety, continuity of supply, quality of service, market facilitation) by analysing the results of Performance Indicators defined in those key areas.

MARCOGAZ set out each Performance Indicator according to the following principles:

- Relevance to the theme covered.
- Ability to collect the data within the different MARCOGAZ Members.
- Accuracy, clarity and stability of harmonized definitions of each Performance Indicator, in order to avoid misunderstanding and to provide a comparative analysis over several years.

The selection of the list of indicators is based on an internal survey among the MARCOGAZ Members. 20 different Performance Indicators have been defined, covering 5 different areas (A → E), and representing major gas distribution activities:

- A: Aspects on the opening of the gas market (3 indicators).
- B: Aspects on continuity of supply (3 indicators).
- C: Aspects on the quality of service (3 indicators).
- D: Aspects on safety (7 indicators).
- E: Aspects on networks characteristics (4 indicators).

Note: The definitions of the above-mentioned indicators are available in the Appendix (See §5).

The objective is to provide a benchmark analysis by collecting data on a yearly basis at a national level, according to the common definitions.

All MARCOGAZ Members were invited to participate in the data collection. The number of contributing countries varies between 2011 and 2019, **with an average of 10 participating countries each year over the period**. **The data collection in 2019 includes figures from 11 countries**. In total, those 11 countries represent about **1,278,613 km of distribution network** with about **58 million customers** connected to this overall network, which is quite representative of the European DSO activity.

The benchmark aims at identifying a range of values for each indicator. Furthermore, the analysis presents the reasons why, for some indicators, the results can vary widely from one country to another. The interpretation of those indicators over several years enriches the analysis by providing a dynamic view of the results. Ultimately, the purpose of this set of indicators is to help participants to share best practices with each other and to measure progress.

Points of attention:

- Due to the large number of existing DSOs in some countries (e.g., Germany and Italy), it is difficult for those countries to determine a consolidated result for all indicators at national level. Therefore, for some countries, the data collected is partial.

- Not all data intended to be collected was available for all the European countries (e.g. indicators on customers' complaints, rate of consumers switch from a supplier to another when it is not the responsibility of DSOs).

2.2. General information

Period:	2011 – 2019
Participating countries (2019):	11 (2018: 10 countries)
Included number of customers (2019):	58 Million (2018: 56 million)
Included length of mains (2019):	1,278,613 km (2018: 1,365,169 km)
Maximum number of contributing countries over the period • Austria • Belgium • Czech Republic • France • Germany • Ireland • Netherlands	• Portugal • Romania • Spain • Ukraine • United Kingdom • Italy • Denmark

Table 1: General information

Report has been anonymised and names of the countries replaced by letters A to N.

3. Analysis and results

3.1. Context of the DSOs in Europe

The world of Gas Distribution is very diverse (history, length of network, number of customers, etc.)

In particular, due to historical reasons, the number of gas DSOs varies greatly from one country to another (e.g., Ireland: 1, Germany: 700 +).

However, all DSO's have succeeded in adapting to the deregulation of the gas market (including residential customers) in compliance with the Energy Directives. They play an important role in this process as market facilitators, supporting the switching process.

Strong differences exist in the volume of gas consumed per country: the penetration rate of natural gas (% of natural gas in the energy mix of each country is widely different, due to the maturity of the gas markets. e.g. UK/Netherlands versus Spain and France). Therefore, the potential for development of natural gas is limited in certain countries but remains important in some others. It is important for gas DSOs to continue to gain new customers and to develop new uses of natural gas (e.g. biomethane, NGV) to compensate for the loss of gas consumers and the decrease of unit consumption per customer due to energy savings and efficiency.

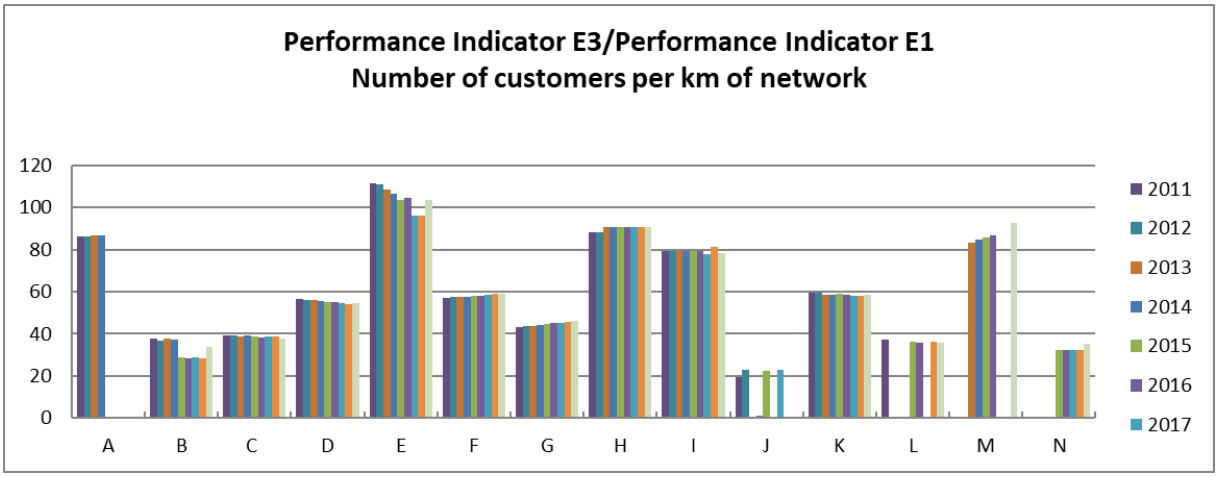


Figure 1 : number of customers per km of network

The graph (see Figure 1) shows that the number of customers per km of network is relatively stable between 2011 and 2019 with average close to 45 customers/km even if differences exist between countries.

This difference could be explained by the following:

- The history of distribution of gas for each country.
- The network coverage within the country or specific concentration in urban areas.
- Strong competition from other alternative energy sources shaping the networks.

3.2. Continuity of supply

3.2.1. Number of interrupted customers

For this indicator, only unplanned interruptions have been included (excluding vandalism and problems downstream of the meter).

More than 80% of the participating countries provided figures for 2019 which is quiet representative compared to 2018 where less than half of contributing countries were able to do so.

Over the last decade, the indicator shows that less than 1% of the customers were interrupted each year in most of the countries. For two of them, the indicator is often up to 3%.

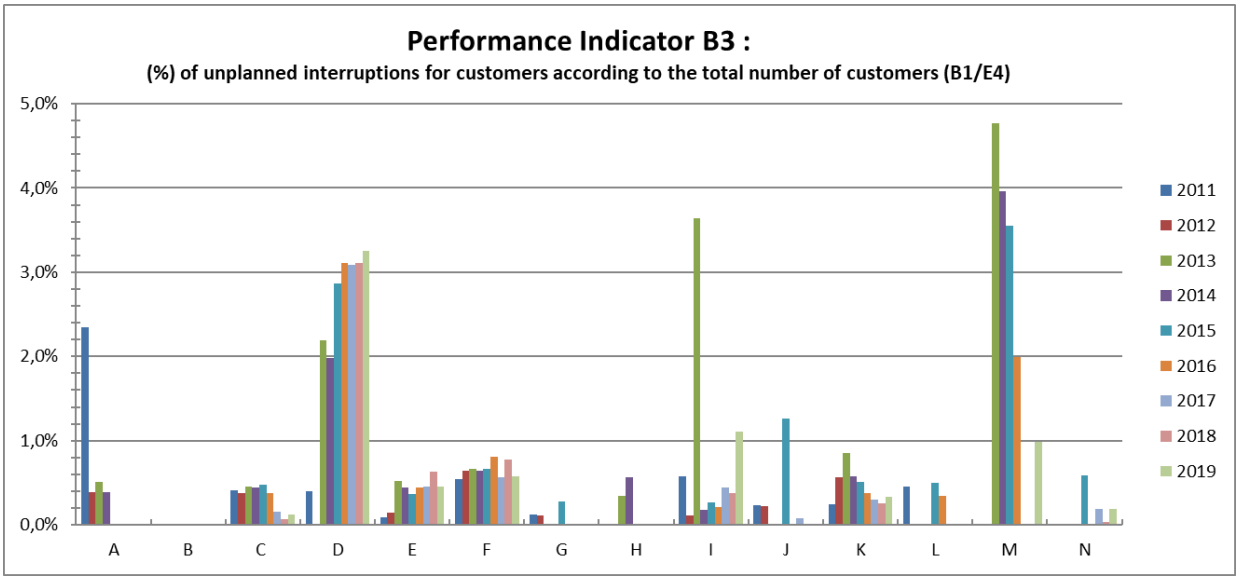


Figure 2 : % of unplanned interruptions versus total number of customer

3.3. Quality of service

3.3.1. Number of complaints

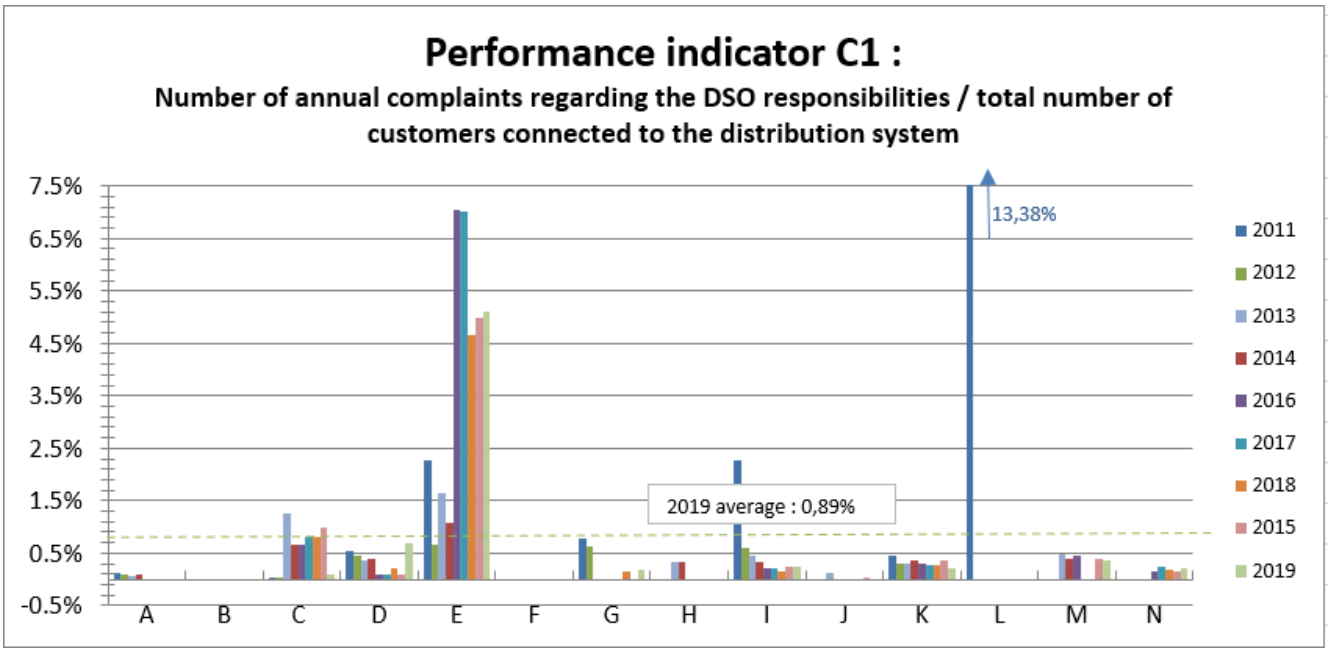


Figure 3 : number of annual complaints

Complaints regarding DSO's responsibility do not include those concerning equipment downstream of the meter. Indeed, for most countries, the responsibility of the DSO stops at the meter. Furthermore, the complaints are dealt with in a timely manner (within the deadline).

Data is available for seven countries in 2019. Nevertheless, these seven countries deliver gas for 35 Million of customers or 60% of the overall customers of the contributing countries in 2019. We can consider that collected data is representative of the 14 collected countries.

Most of the complaints received concern gas metering (blocked gas meter, disagreement with the metered quantity (false figure)), delay for connecting new premises and quality of road work.

3.3.2. Cut-offs asked by supplier

Data are available for only five countries in 2019 representing less than 44% of the overall customers of the contributing countries in 2019.

Nevertheless, if we consider the 2011-2019 period, two distinct groups of countries appear. First group with less than half of the requested cuts-off realized in time, and the second group with 100% each year.

It can be explained by the rules about the handling of cuts-off by the DSO on request of the suppliers which are not harmonized in Europe.

- For most of the countries, all cut-offs or nearly all cut-offs requested by the supplier are realized. In one of those countries, suppliers ask for two types of cut-off: a strict one, immediate, and an optional one (no cut-off if the customer pays during the DSO's visit). For three other countries, the cut-off is immediate.

- In one country the law prohibits disconnection thereby resulting in more work required by the DSO.

- In other countries, cut-offs of customers are decided and executed by the DSO and not requested by the supplier.

3.4. Safety

3.4.1. Number of repairs per detected leaks

This indicator, D1, is defined as the total number of repairs performed during either an emergency situation and a planned repair (when leaks are detected through planned inspection). The situation is heterogeneous between contributing countries, related to the age and the materials used in the network. Therefore, the comparison of the figures between countries is difficult.

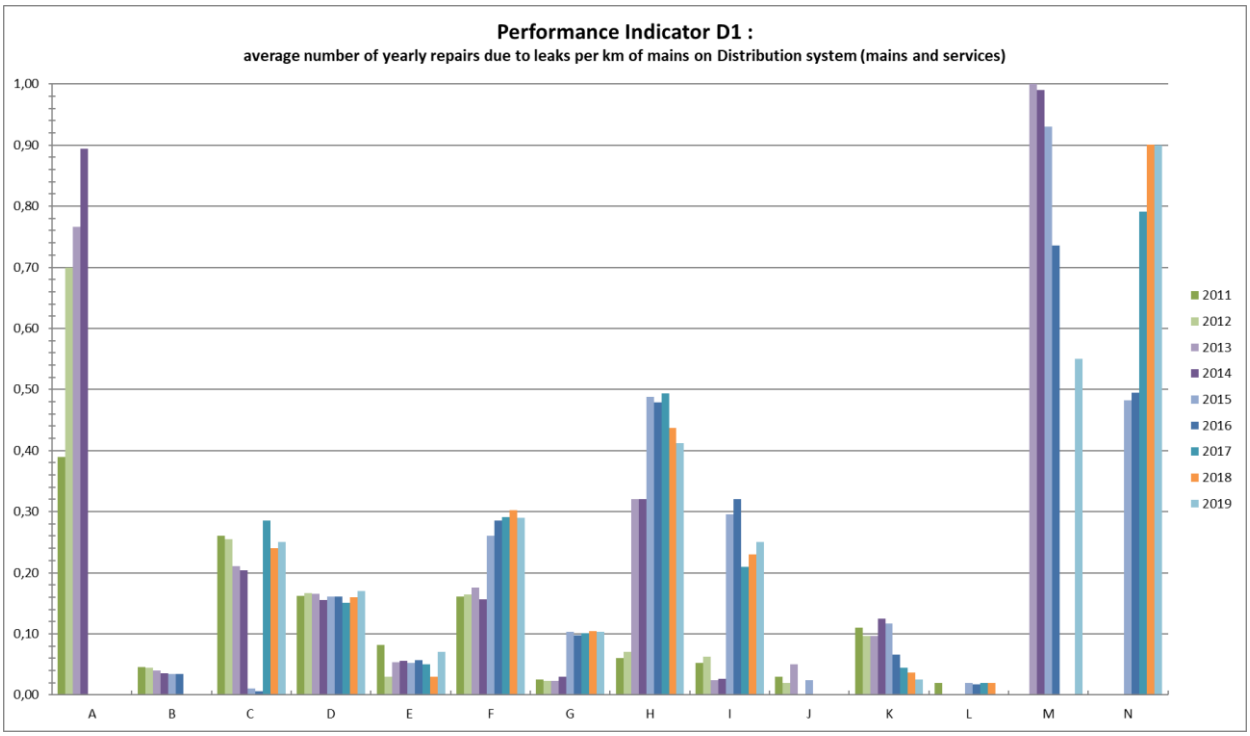


Figure 4 : number of yearly repairs due to detected leaks per km

Most of the contributing countries have a rate around the 2019 average of about 0,17 without a very sensitive trend, except three countries, where number of repairs due to detected leaks is above other countries. In one of them, a higher cast iron population, consequently, contributes toward a higher figure. For the two other countries, networks are in PE and steel. In one of them, the leak rate decreases, as the steel population is renewed.

3.4.2. Emergency interventions

The graph (see Figure 5) shows variations between 2011 and 2019 in the number of emergency interventions per year and per km, occurring on the distribution system which is under the responsibility of the DSO (e.g. before the meter).

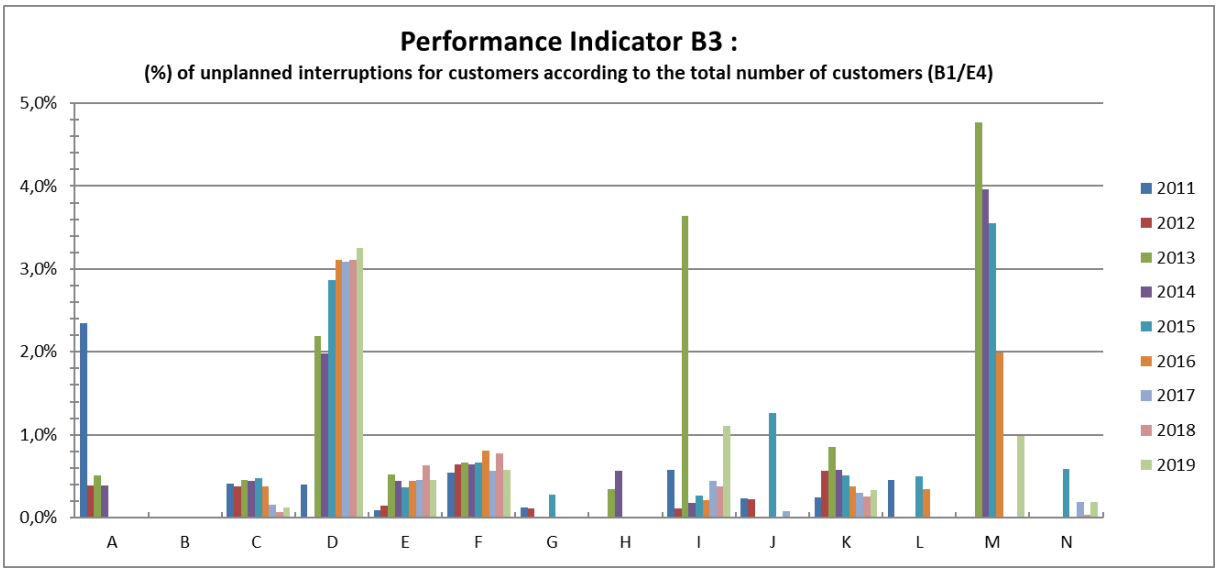


Figure 5 : emergency interventions

The graph shows a large disparity between the contributing countries. The total number of emergency interventions is much higher than the number of interventions for leaks (mostly about two or three times higher). Lack of gas, pressure drop, or excess of pressure, fire and explosion are the main reasons for interventions.

For most of the contributing countries the rate of interventions per km and per year has continuously decreased over the period and could relate to the renewal policies with an increasing part of PE population and decreasing part of steel and iron cast population.

3.4.3. Time duration of emergency intervention

This average time duration between the received emergency phone calls and attendance on site to the incident has remained stable over the last decade for most of the contributing countries and substantially decreased for one of them. It is between 25 and 40 minutes, with an average being around 30 minutes (duration time from 2011, 8 countries sharing continuously data on that item over this period).

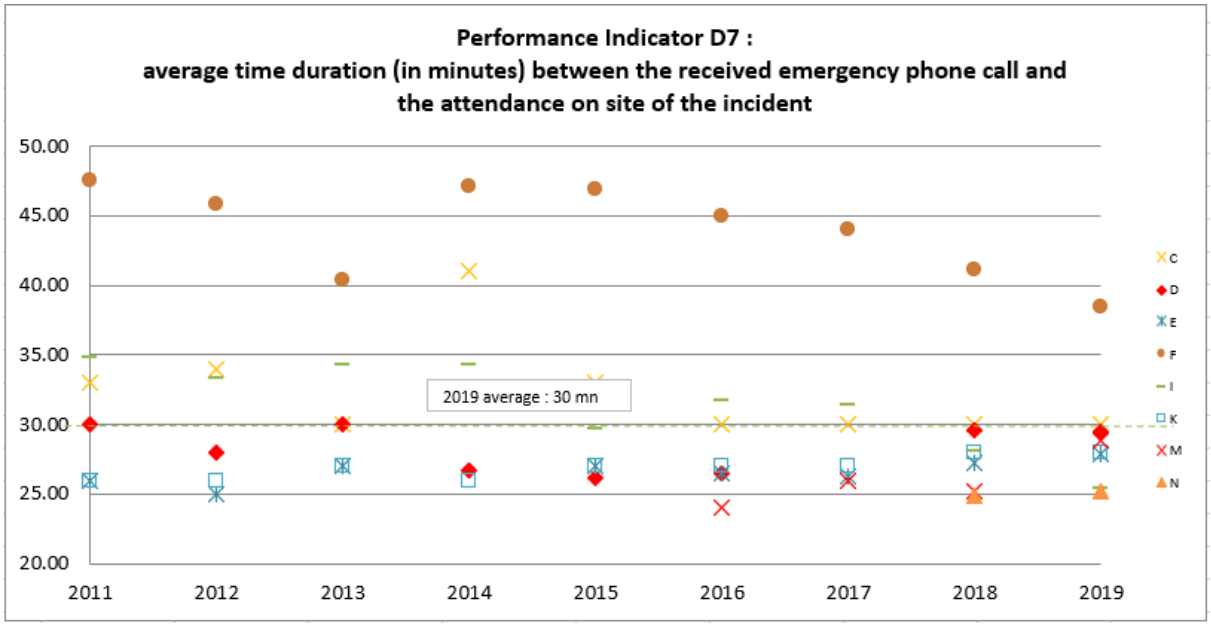


Figure 6 : Average time duration between the emergency call and the attendance on site

3.4.4. Third party damage

The graph shows a general downward trend for third party damage until 2019. In most of contributing countries, measures were taken to reduce 3rd party damage. Good practices are implemented in most countries (training, awareness, etc.).

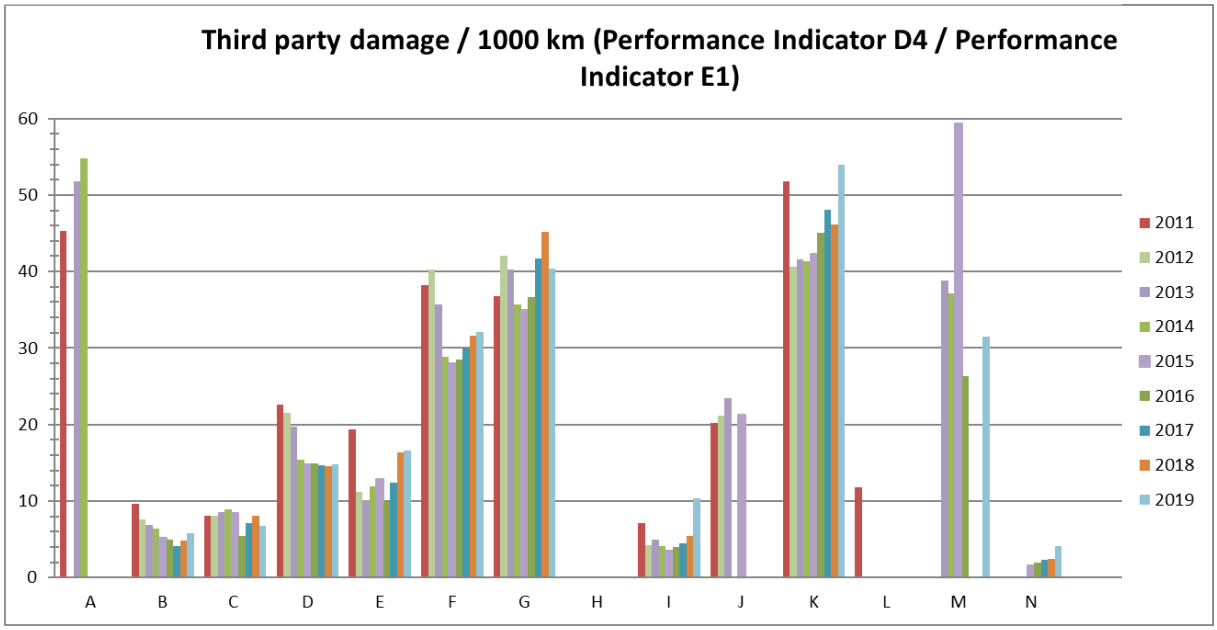


Figure 7 : Third party damages per 1000 km

Figures for some countries include a high proportion of service interference damages (compared to overall main network length). Higher figures due to a high proportion of high-density urban environments or PE services located in gardens / driveways subject to ground levels changing over time.

In some countries, figures were historically low and remain low.

In most of the countries a slight increase is observed since 2017. Nevertheless, when considering the evolution over the years of the global indicator for all the responding countries, one can clearly observe a continuous decrease due to action plans held in most of the countries to enhance industrial safety.

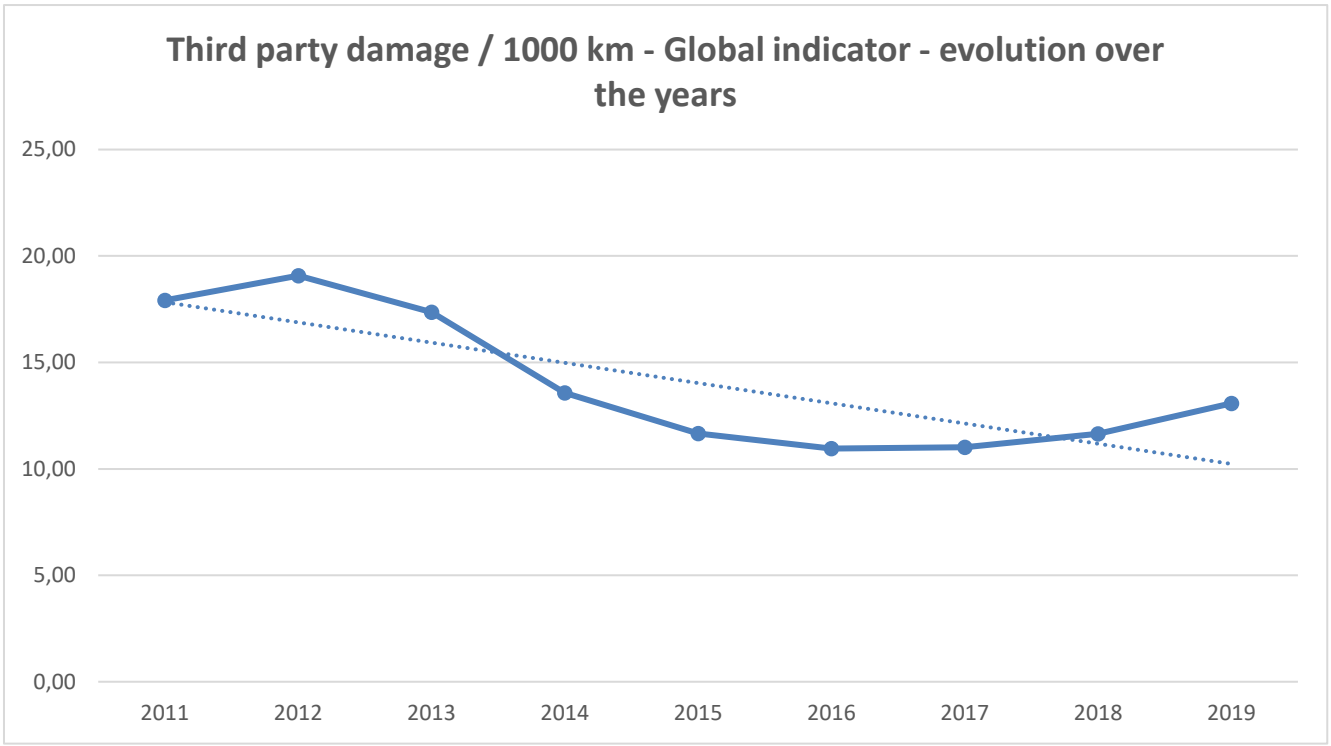
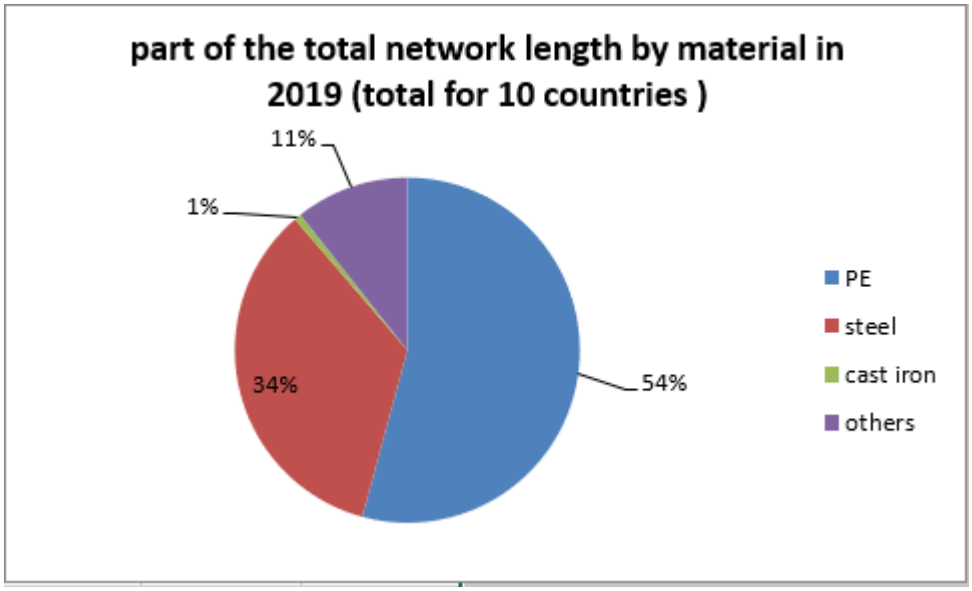
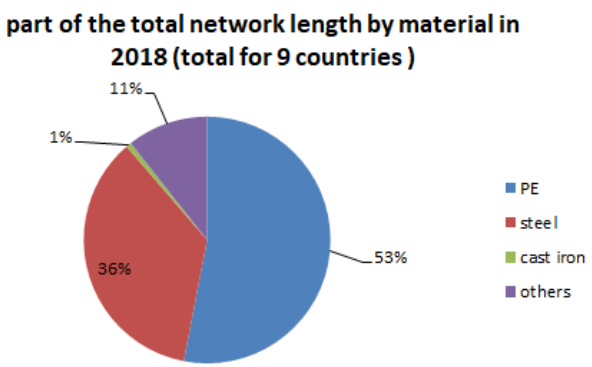
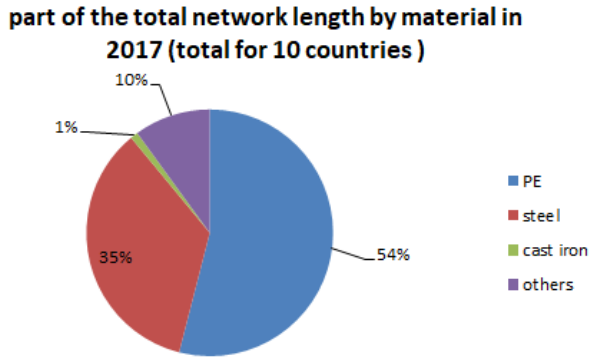


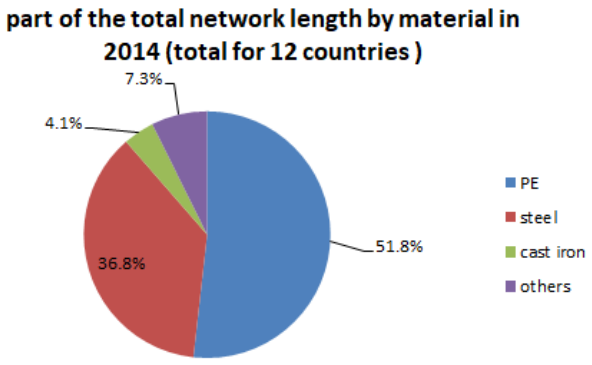
Figure 8 : Evolution of the third party damage per 1000 km

3.5. Network characteristics









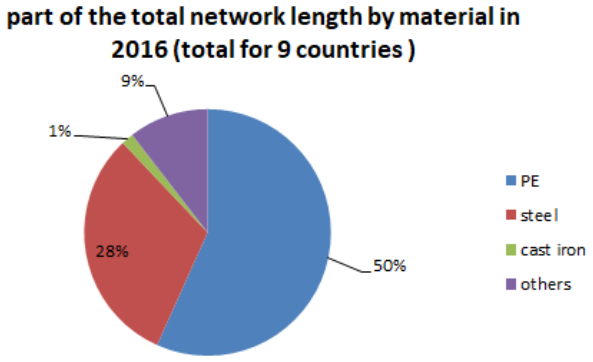


Figure 9 : network characteristics– length per material

Polyethylene (PE) and steel are the main materials for most countries.

PE is predominantly the main material used in the gas networks. As major countries with a large part of PE in total network length did not collect data over 2011-2019 period, the analysis of the PE versus Steel chronicle through dedicated charts is not relevant.

The continuous decrease of cast iron can be observed without doubt in the Figure 9. It has been progressively taken out of commission across the networks.

Some particularities to highlight. In one country (K), the gas network is almost exclusively constructed of PE pipes. One country has 65% of other materials within its total length (type = others). One country (N) has most of its network made of steel and a lower part of PE pipes.

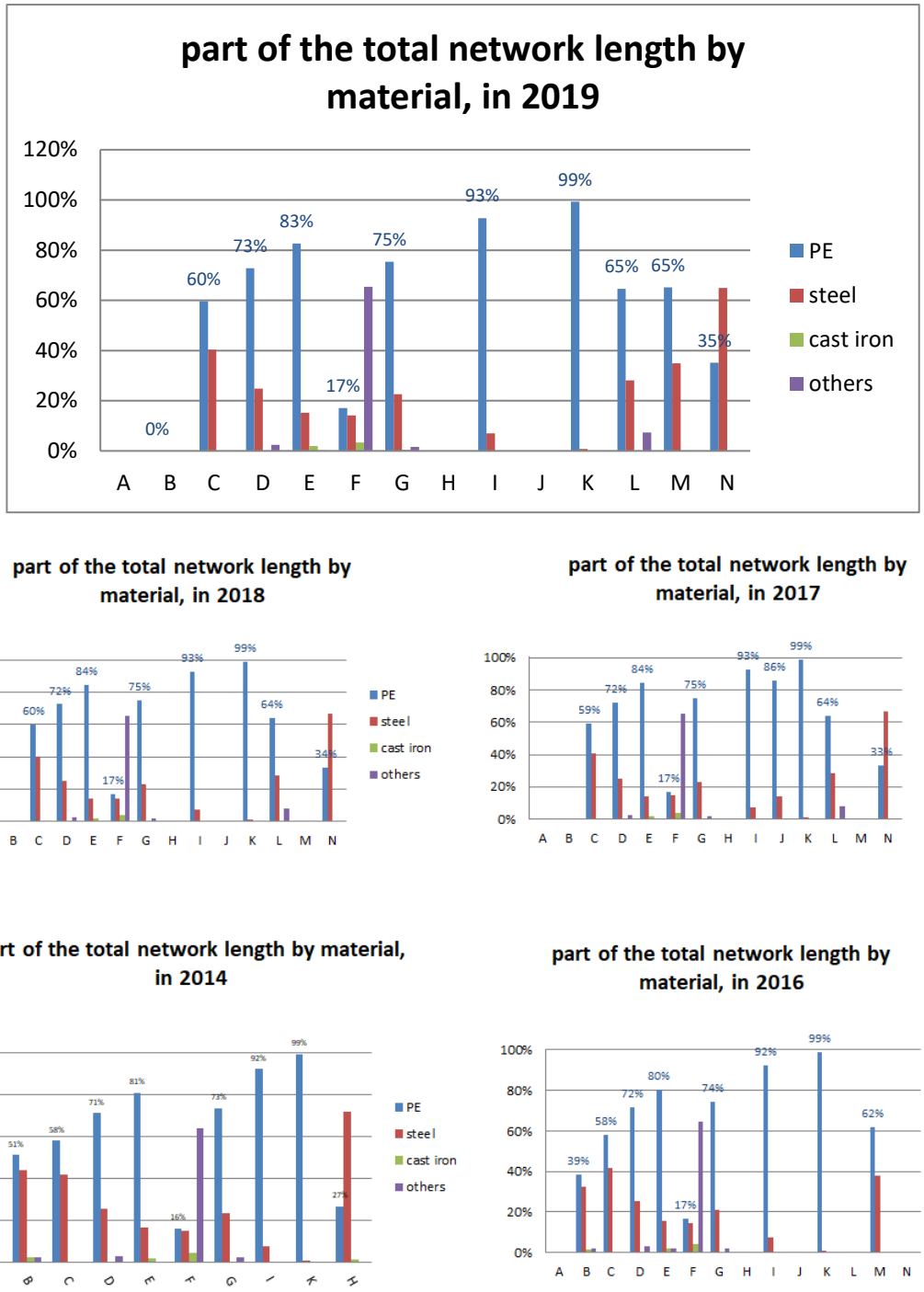


Figure 10 : network characteristics – length per material and per country

4. Conclusions

This report is the result of an intensive cooperation among DSOs members of MARCOGAZ, regarding performance and an exercise to merge key indicators between gas Distribution System Operators which serves as a good source for benchmarking.

In summary, of the 5 different areas covered we can conclude:

- **Context of the DSO in Europe** : strong differences between DSOs, depending on number of DSOs per country, penetration rate, and volumes.

- **Continuity of supply**: A limited number of customers are disconnected each year. For most of the countries, only 5 customers from 1000 have an interruption per year. This means that on average, a customer has an interruption of supply every 200 years (one interruption every 50 years for countries with a higher rate).

- **Quality of service**: The rate of complaints is very low, and they are dealt with in time. One reason for this is the good management by DSOs, as demonstrated by the Indicator within this report.

- **Safety**: There is a general downward trend regarding the average time duration (min) per year between the received emergency call and the arrival on site of the incident. It turns around 30 minutes and is constantly achieved.

  Regarding third party damage, in most of the countries a slight increase is observed since 2017. Nevertheless, the global trend over the last decade shows continuous decrease of third party damages per km as a result of prevention actions plan ongoing for many years in most of the countries.

- **Networks characteristics**: Older material, like for example cast iron, used on the network is progressively disappearing. They are replaced most of the time by PE which consequently results in a decrease of leaks number in the majority of the countries.

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5. APPENDIX : Definitions for the performance indicators data base

A1: Number of existing DSOs	Number of Distribution System Operators legally authorized to exercise this activity functioning within the country.
A2: Recorded distributed gas quantity (gross value)	Recorded information of distributed gas quantities (volume or energy). Total quantity of gas which flows on the grid of the DSO.
B1: Number of yearly unplanned end-users' interruptions of gas supply	Total number of customers having an unplanned interruption during the year; an unplanned interruption of gas supply means that the gas pressure is lower than the contracted one.
B2: Average unplanned interruption duration per year (in minutes)	Average cut-off time by customer who has been interrupted.
B3: Unplanned interruption Frequency per year (in %)	Total number of interrupted customers (B1) / Total number of customers (E4).
C1: Indicator on complaints per year	Number of annual complaints regarding the DSO responsibilities / total number of customers connected to the distribution system.
C2: Indicator on processed Complaints per year	Number of annual processed complaints / total number of complaints.
C3: Ratio of cut-offs asked by the supplier and realized by the DSO (for interruptions per year following a lack of payment)	It is the ratio of realized gas supply cut-offs / requested cut offs by the supplier, completed on time.
D1: Number of yearly repairs per detected leaks per km of mains on the Distribution system (mains and services)	Number of emergency repairs (not detected by planned inspections) + Number of planned repairs (detected by planned inspections). Leaks on mains and services (connections).
D2: Number of emergency (unplanned) repairs per year	Number of emergency repairs (not detected by planned inspections). Leaks on mains and services (connections).
D3: Number of planned repairs per year	Number of planned (detected by planned inspections) repairs. Leaks on mains and services (connections).
D4: Number of annual third-party interference or damage with leaks	Number of annual third-party interference or damage, with leaks, occurring on the distribution system which is under the responsibility of the DSO.

D5: Number of accidents per year	Number of accidents per year = number of events related to natural gas which has caused physical injuries (hospital > 24 h) or fatalities or big materiel damage (> 100 000 EUR). Accidents under responsibilities of the DSO (occurred before the meter). Data of fatalities and injuries of internal personal/contractors are excluded.
D6: Number of emergency interventions per year per km, occurred on the distribution system 12 (before the meter) which is under the responsibility of the DSO.	Emergency intervention = explosion, fire, leak of gas, lack of gas, excess of pressure, pressure drop.
D7: Average time duration per year between the received emergency phone call and attendance on site of the incident.	
E1: Total main network length in the annual report (in km)	Figures at national level
E2: Main network length per material in the annual report (in km)	Figures at national level
E3: Number of total metering points in the annual report	Figures at national level
E4 : Total number of customers	Figures at national level