



ANNUAL REPORT

2020

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PRESIDENT'S FOREWORD

We are living in unprecedented times. The **COVID-19 pandemic** has tested our ability to adapt quickly to changes in how we operate and collaborate with each other. Amid all the unexpected disruptions, the gas TSOs had the protocols and safety procedures in place to ensure **security of gas supply was not impacted** and the dispatching teams, pipeline construction crews and others in critical operational services could **work safely**. People make the difference, and I am proud of the **collective efforts** of the ENTSOG members and Brussels Team to facilitate as close to 'business as usual' as possible in these difficult circumstances.

And indeed, the ENTSOG work continued at pace in 2020. Following the publication of ENTSOG's 2050 Roadmap for Gas Grids at the end of 2019, the **ENTSOG 2050 Roadmap Action Plan** was developed with the Members and through extensive stakeholder engagement, to enable discussion on three main principles: how to deliver Europe's **future energy networks**; having the **similar market principles for all gases, including hydrogen**; and gas **TSOs as system integrators** in the emerging hybrid energy system.

It was a busy year preparing for the European Commission's upcoming Hydrogen and Gas market Decarbonisation Package of legislation. The EC published their **Energy System Integration and Hydrogen Strategies** in 2020, calling on stakeholders to provide their feedback during consultation processes. ENTSOG contributed to these and on other topics relating to the revisions of the EU rules on Trans-European Networks for Energy (the **TEN-E Regulation**) and EU Renewable Energy Directive (**RED II**).

Along with the EC, I believe that hydrogen is the essential component for a successful energy transition, but the **appropriate regulatory framework** needs to be in place to provide clarity for investments and to facilitate rapid scale-up. TSOs can be deeply involved in driving decarbonisation via zero and low carbon gases, in particular hydrogen. Hydrogen-ready gas infrastructure enables the transition from coal to natural gas and then to hydrogen and low carbon gases. **Repurposing and retrofitting existing gas infrastructure** for the transport of **hydrogen and hydrogen blends** will encourage investment in renewable and low carbon gases while maintaining an integrated gas market. Gas TSOs already have experience in **planning, financing, constructing and operating efficient networks**, and these skills and capabilities are ready to be deployed in contributing to the development of the future hydrogen network.



I believe that hydrogen is the essential component for a successful energy transition, but the appropriate regulatory framework needs to be in place to provide clarity for investments and to facilitate rapid scale-up.



As always, well-structured and efficient **engagement processes** are key for ENTSOG at this critical time, when plans are underway which will shape our future plans and activities. To continuously improve its way of working and developing its relations with key stakeholders, ENTSOG will continue with regular engagement with ACER and EC, but also continue to build productive and effective mutual dialogue with **electricity, hydrogen and gas value chain stakeholders**.

ENTSOG has played a key role in delivering Network Codes, the integration of the European gas market and security of supply. Our next goal is to contribute to the achievement of net-zero decarbonisation by 2050, and we are determined to provide our contributions to this overall EU energy and climate target. Given the long lead times for pipeline projects, it is about time to get started.



STEPHAN KAMPHUES

President, ENTSOG

GENERAL DIRECTOR'S FOREWORD

2020 was an unusual year in many respects, as we as a society learnt a new way of working and living through the **COVID-19 pandemic**. Like many other organisations, the ENTSOG Brussels Team spent most of 2020 working from home – communicating, cooperating, and working online to ensure all the planned tasks and outputs were well delivered. It was also again evident the vital role the European gas infrastructure has in ensuring business continuity so that **essential services are maintained for communities and the economy**, during times of crises.

EU's commitment to the European Green Deal within the midst of a post-pandemic economic recovery is stronger than ever, and ENTSOG fully supports this. EC's Hydrogen Strategy published in July 2020 reflects the important role that **'molecules'** – today natural gas, in the future hydrogen and biogas – will play together with the growing electrification. ENTSOG welcomes EC's acknowledgement in their recent energy transition stakeholder consultations of the role of **repurposing/retrofitting of existing grids** in the transport of hydrogen and other low carbon gases in an efficient manner, helping to keep the costs of the transition as low as possible. ENTSOG aims to always present its views clearly, transparently, and fact-based on these and other topics of strategic importance, such as **Guarantees of Origin and certificates, TEN-E revision, gas quality and hydrogen handling, methane emissions and regional cooperation** – in preparation for EU gas rules being revised to facilitate the market entry of renewable and low carbon gases.

ENTSOG published its **2050 Roadmap Action Plan** in October 2020 to outline the practicalities of developing and managing Europe's infrastructure for all gases, including hydrogen and the proposal for follow up

dialogue and engagement with experts and policy makers. ENTSOG hosted its **Annual Conference 'Future of Gas Grids'** online in December 2020 to openly discuss with key stakeholders how, by building on existing market fundamentals, the scaling up of the hydrogen economy can be facilitated by gas TSOs in creating the **open access to grids**, identifying and connecting **points of supply and demand**, and by sharing **TSOs experience in markets organisation**. ENTSOG continues to outreach to new audiences in the gas, hydrogen and electricity value chains, including industry, NGOs, Member States and institutional stakeholders.

Alongside ENTSOG's engagement in developing the role for gas and gas infrastructure in the European energy transition, ENTSOG does maintain its focus on delivering on our traditional tasks within **market facilitation, infrastructure development and infrastructure operation**.



ENTSOG welcomes EC's acknowledgement in their recent energy transition stakeholder consultations of the role of repurposing/retrofitting of existing grids in the transport of hydrogen and other low carbon gases.



The implementation and effect monitoring reports for the **Tariff NC, Balancing NC and Interoperability and Data Exchange NC** were delivered in 2020. Four issues which had been posted to the joint **ACER-ENTSOE Network Codes Functionality Platform** had been solved or closed in 2020, and two new issues posted.

ENTSOE adopted and published the **final Ten-Year Network Development Plan (TYNDP) 2020 Scenarios Report**, again developed jointly with ENTSO-E and with three joint scenarios for possible futures for the development of EU's energy supply and consumption. The **draft TYNDP 2020** was published at the end of the year and once all stakeholder feedback has been considered, the report will be adapted and finalised. Looking towards **TYNDP 2022**, ENTSOE had already in 2020 started **collecting the projects** that intend to apply to the upcoming EC 5th PCI selection process. In line with the EC's Hydrogen and Energy System Integration Strategies, the deeper assessment of interaction and synergies between gas and electricity projects and infrastructure, and the **inclusion of hydrogen infrastructure**, is being included in both the TYNDP 2022 Scenarios development exercise and the TYNDP 2022 assessment itself.

It is an exciting time for ENTSOE and its members, and we are ready for the challenges that come with rapid change. We will also continue to work as a **proactive, trusted adviser** on gas transmission related topics on a European level, as has been done over the years. The structure of ENTSOE, with the embedded expertise of its members as well as of its Brussels office, will continue to play a pivotal role in the further development of the European gas markets, including hydrogen markets.

JAN INGWERSEN

General Director, ENTSO E



1

ORGANISATIONAL STRUCTURE AND MEMBERSHIP



The role of the European Network of Transmission System Operators for Gas (ENTSOG) is to facilitate and enhance cooperation between national gas transmission system operators (TSOs) across Europe, and to ensure the development of a pan-European transmission system in line with European Union energy and climate goals.

ENTSOG operations are governed by its General Assembly (GA), which leads the Association and has full powers to enable it to achieve its objectives. Its tasks include the admission of Members; the appointment of the Management Board, the General Director and business area Directors; the establishment of working and regional groups; and the adoption of ENTSOG deliverables.

manage the many activities with which ENTSOG are tasked - the development and implementation of Network Codes and guidelines and assessment of current and future gas market design (Market); activities associated with scenario building and future gas infrastructure planning (System Development); cooperation for security of supply and providing transparency, ensuring REMIT compliance and technical cooperation (System Operation and System Development); coordination of strategic topics and policy processes within ENTSOG and communication of associated ENTSOG activity outside the organisation (Strategy,

Internally, ENTSOG is divided into four business areas: Market, System Development, System Operation and Strategy, Policy and Communication. These areas

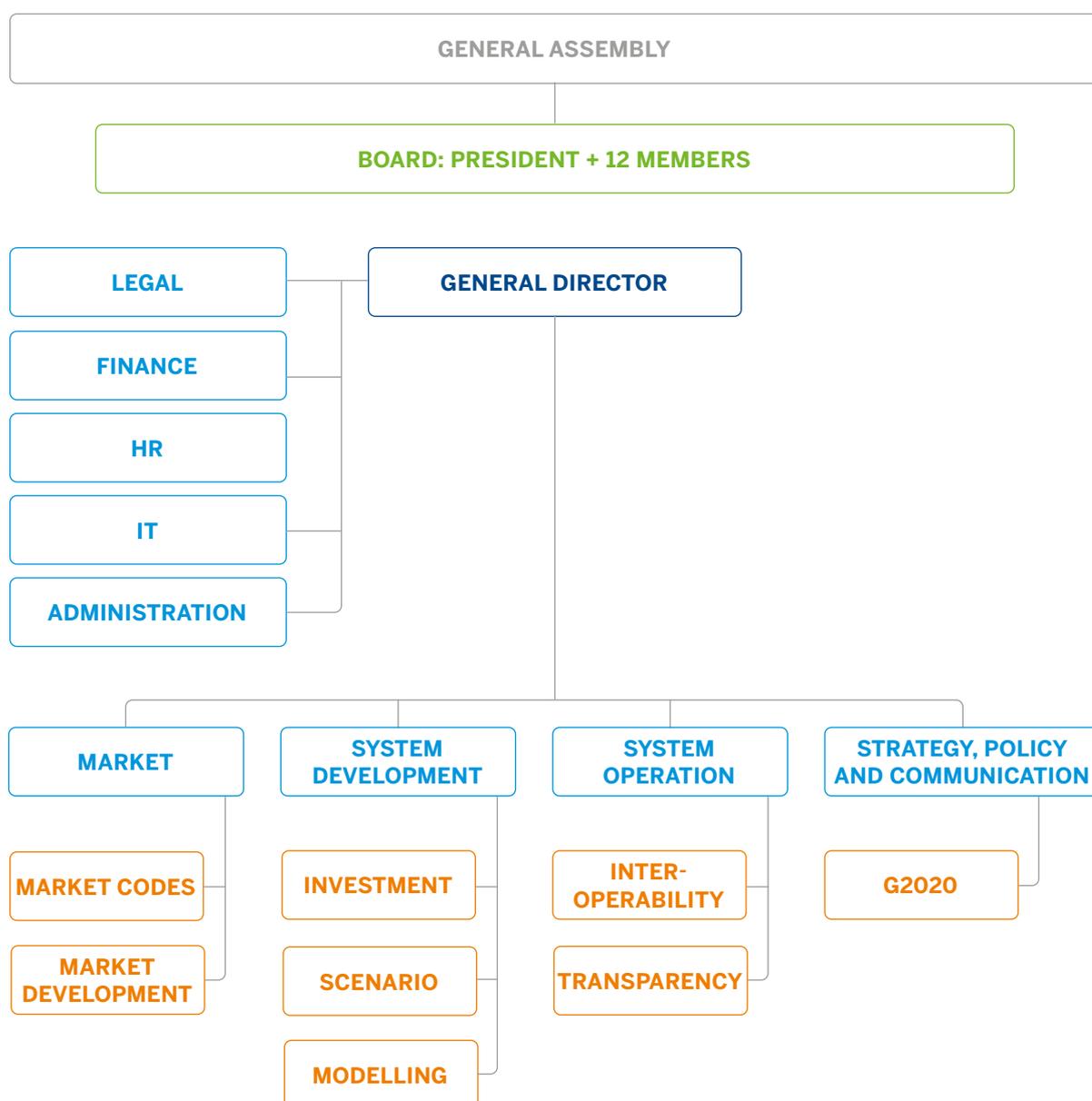


Figure 1: ENTSOG internal organisational structure (as of 31 December 2020)

Policy and Communication). The Management Support team provide legal, HR, Finance, and IT support to the ENTSOG team.

ENTSOG Working Groups (WG), Kernel Groups (KG) and Task Forces (TF) associated with delivering tasks are assigned to the four business areas. The main WGs are shown in Figure 1. A WG is the primary vehicle for the management and delivery of ENTSOG's main content outputs (e.g., TYNDP, Summer/Winter Outlooks, Network Codes, position papers, responses, etc.) before their validation at Board and approval at GA level. A KG is a more specialised group set up within a WG for the preparation of documents, proposals or for discussion of specific technical issues to prepare and facilitate the WG discussions.

A TF is established specifically for particular activities that do not fit within the scope of existing WGs or due to the cross-functional nature of the activity. It is established by the Board upon recommendation of the General Director, including the specification of its Terms of Reference. WGs and TFs typically meet on a monthly basis and KGs meet on an ad-hoc basis, as required. The management team has five support groups which provide compliance, financial and other services across the association. These are Legal, HR, Finance, IT and Administration.

The structure of ENTSOG with the embedded expertise of its members, as well as that of its Brussels office, will continue to play a pivotal role in the further development of the European gas markets.

ENTSOG MEMBERSHIP

Since its foundation on 1 December 2009, ENTSOG Member TSOs have provided wide coverage of the European gas market, operating in Member States of the European Union. ENTSOG's Articles of Association were modified in December 2010 to admit TSOs from EU countries derogated from the Third Energy Package, as Associated Partners. This allows such TSOs to participate in ENTSOG activities. In February 2011, TSOs from Third Countries (candidates for EU accession, members of the Energy Community, EEA or EFTA), interested in following development of ENTSOG activities, were also admitted to the Association as Observers.

As of end of 31 December 2020, ENTSOG's membership was comprised of:

44 TSO Members, 3 Associated Partners from EU countries, and 9 Observers from non-EU countries.

MEMBERS (44)

Austria	– Connect Austria GmbH – TAG GmbH	Germany	– bayernets GmbH – Fluxys TENP GmbH – GASCADE Gastransport GmbH – Gastransport Nord GmbH – Gasunie Deutschland Transport Services GmbH – GRTgaz Deutschland GmbH – NEL Gastransport GmbH – Nowega GmbH – Ontras Gastransport GmbH – OGE GmbH – terranets bw GmbH – Thyssengas GmbH
Belgium	– Fluxys Belgium S. A.		
Bulgaria	– Bulgartransgaz EAD		
Croatia	– Plinacro		
Czech Republic	– NET4GAS, s.r.o		
Denmark	– Energinet		
Finland	– Gasgrid Finland Oy		
France	– GRTgaz – TERÉGA		

Greece	– DESFA S. A.	Portugal	– REN – Gasodutos, S.A.
Hungary	– FGSZ Natural Gas Transmission	Romania	– Transgaz S.A.
Ireland	– Gas Networks Ireland	Slovak Republic	– eustream, a.s.
Italy	– Infrastrutture Trasporto Gas S.p.A. – Snam Rete Gas S.p.A. – Società Gasdotti Italia S.p.A.	Slovenia	– Plinovodi d.o.o.
Lithuania	– AB Amber Grid	Spain	– Enagás S.A. – Reganosa S.A.
Luxembourg	– Creos Luxembourg S. A.	Sweden	– Swedegas AB
Netherlands	– BBL Company V.O.F. – Gasunie Transport Services B.V.	United Kingdom	– GNI (UK) – Interconnector (UK) Limited – National Grid Gas plc – Premier Transmission Limited
Poland	– Gas Transmission Operator GAZ-SYSTEM S. A.		

ASSOCIATED PARTNERS (3)

Estonia	– Elering Gaas AS	Switzerland	– Trans Adriatic Pipeline AG (Greece, Albania, Italy)
Latvia	– Conexus Baltic Grid		

OBSERVERS (9)

Albania	– Albgaz	Switzerland	– Swissgas AG – Erdgas Ostschweiz AG – Transitgas AG
Bosian and Herzegovina	– BH-Gas Ltd. Sarajevo	Ukraine	– LLC Gas Transmission System Operator of Ukraine
North Macedonia	– GA-MA AD		
Moldova	– Moldovatrangaz		
Norway	– Gassco AS		

Status as of 31 December 2020

MEMBERS MAP

STATUS: DECEMBER 2020

44 Members

3 Associated Partners

9 Observers



Since its foundation, ENTSOG member TSOs have provided wide coverage of the European gas market. In addition, according to ENTSOG's Articles of Association, TSOs from EU countries currently derogated from the Third Energy Package are Associated Partners and can participate in its activities.

Since 2011, TSOs from Third Party countries (candidates for EU accession, members of the Energy Community or EFTA) interested in following development of the network codes were also admitted to the Association as Observers.

AUSTRIA, GERMANY AND SWITZERLAND



2

SUMMARY OF ENTSOG'S ACTIVITIES AND DELIVERABLES IN 2020



The Annual Report assesses ENTSOG's work and achievements retrospectively for each given year and provides an opportunity to assess the status of work when comparing the executed results against those planned in the Annual Work Programme.

ENTSOG's tasks are mainly defined in Regulation (EC) No 715 / 2009, which includes the development and monitoring of the implementation and effect of Network Codes for Market and System operation, developing Ten-Year Network Development Plans (TYNDPs), providing regular information on gas supply and demand for the European gas market and delivering transparency and common operational tools to ensure network security and reliability. While its focus remains on these activities, it also now includes the assessment of the future progress of the

functionality of the European gas markets and looking at longer term horizons for European Scenarios, to meet EU energy and climate goals.

A summary of the key ENTSOG activities is provided in the following sections. The key deliverables are outlined in section "ENTSOG Deliverables".

The status of the activities and deliverables which had been planned and included in the AWP2020 are provided in section "Work Programme status".

MARKET NETWORK CODES AND GUIDELINES AND MARKET DEVELOPMENT

MARKET NETWORK CODES AND GUIDELINES

ENTSOG has developed Network Codes containing rules on how to further integrate the EU gas market as well as for system operation and development. The Network Code development process begins when the EC submits a request for a Framework Guideline to the Agency for the Cooperation of Energy Regulators (ACER). Next, ENTSOG transforms the ACER Framework Guideline into a Network Code while conducting extensive public consultations.

Once approved through the European comitology procedure, a Network Code becomes legally binding for all Member States. The EC proposed not to include new items on the annual priority list for 2021 for the development of harmonised gas rules but to focus on the full and correct implementation of the existing market rules in all Member States. ENTSOG continues to monitor and analyse the implementation of the Network Codes and the EC Guidelines and their effect.

The following list outlines the timeline for publication and implementation of each of the Network Codes and Guidelines:

Publication	Implementation
Guidelines on Congestion Management Procedures (CMP GLs) and on Transparency	Published as Annex I to Regulation (EU) No 715/2009, entry into force on October 2013. Only one ENTSOG member has not yet fully implemented the CMP GLs.
CAM NC – Network Code on Capacity Allocation Mechanisms in Gas Transmission Systems	Published on 14 October 2013 as Regulation (EU) No 984/2013, entered into force on November 2015. CAM NC – Amendment for Incremental capacity. Regulation (EU) 2017/459, the first amendment of the NC, entering into force on 6 April 2017, implementation still on going.
BAL NC – Network Code on Gas Balancing of Transmission Networks	Published 26 March 2014 as Regulation (EU) No 312/2014, implementation still ongoing.
INT NC – Network Code on Interoperability and Data Exchange Rules	Published on 30 April 2015 as Regulation (EU) No 703/2015, implemented by May 2016
TAR NC – Network Code on Harmonised Transmission Tariff Structures for Gas	Published on 16 March 2017 as Regulation (EU) No 460/2017, entry into force on 6 April 2017, implementation still ongoing



Picture courtesy of GAZ-SYSTEM

During 2020, the Market Codes ENTSOG team, together with the Market Codes Working Group (MC WG), worked on the following topics to fulfil ENTSOG's monitoring obligation: publication of the Implementation and Effect monitoring reports for BAL NC and TAR NC and development of questionnaires for the analysis and preparation of Implementation and Effect monitoring reports for CAM NC and CMP GLs with publication envisaged in the second quarter of 2021.

Additionally, the MC WG was active in the following workstreams: collaboration with ENTSOG Legal

Advisory Group and ACER for the elaboration of ACER-ENTSOG joint paper with recommendation to address the recent balancing suspected misconduct cases which occurred in Europe¹⁾; issues raised through the jointly managed ACER and ENTSOG Functionality Process as well as improvements to the Functionality Process and Platform itself, with the objective of facilitating the implementation of the Network Codes and improving the functioning of gas markets; preparation of Capacity Auction Calendar for 2021/22 with publication in January 2021 and support to the Market Development WG and the other Working Groups on network codes and guidelines-related topics.

MARKET DEVELOPMENT

During 2020, the Market Development ENTSOG team and Market Development Working Group (MD WG) contributed to the development of ENTSOG's 2050 Roadmap Action Plan, which provides recommendations and actions for the decarbonisation of gas infrastructure. MD WG worked on proposals for several consultations from the European Commission, focusing mainly on the Energy System Integration and Hydrogen Strategies and related topics. The MD WG also reviewed external reports and provided ENTSOG positions on the regulatory framework for renewable and low carbon gases, including hydrogen.

During the year, the Market Development team in coordination with the Guarantee of Origin Kernel Group (GO KG) actively participated in the CEN process to revise the standard on Guarantee of Origin (GO). With other associations under the banner of the GO Prime Movers group, recommendations have been made during the Madrid Forum on the 14–15 October on the revision of the Renewable Energy Directive (RED II revision), to develop an EU wide GO market.

1) [ACER-ENTSOG Joint Policy Paper](#) with recommendation on suspected misconduct in EU balancing market

SYSTEM DEVELOPMENT SCENARIOS AND INFRASTRUCTURE

In June 2020, together with ENTSO-E and following the outcome of the public consultation, ENTSOG adopted and published the final TYNDP 2020 Scenarios Report.

In November 2020, ENTSOG published the draft TYNDP 2020 for public consultation feedback and ACER's Opinion. It is planned to publish the final TYNDP 2020 Report in spring 2021.

ENTSO-E and ENTSOG had also started working jointly to develop and implement a project screening

methodology, which considers the outcomes of the Interlinked Model Focus Study. ENTSO-E and ENTSOG are also developing a dual assessment methodology for electricity, gas and hybrid projects for its application as a pilot project on the basis of TYNDP 2020, and as an extensive analysis for the TYNDP 2022 and beyond.

In the last months of 2020, ENTSOG collected projects intending to apply to the upcoming 5th PCI selection process through ENTSOG's Project Portal.

SECURITY OF SUPPLY AND REGIONAL COOPERATION

In 2020, ENTSOG and EU TSOs continued to ensure security of gas supply and preparedness for possible crises or emergency situations. With respect to the Covid-19 pandemic, TSOs took relevant measures to avoid any potential negative impact on system operations and business continuity, by systematically exchanging their good practices, measures and experiences and following fundamental principles from the Regional Coordination System for Gas.

ENTSOE also supported the EC and the Gas Coordination Group (GCG) by providing operational and gas system relevant expertise during the pandemic, as well as in the implementation of the revised Security of Supply Regulation, especially in the preparation and implementation of solidarity principles, regional emergency, and preventative action plans.

ENTSOE and the TSOs supported a study carried out by Trinomics for DG ENER to analyse the resilience of

the supply chains of critical energy infrastructure by providing relevant input.

The Summer Supply Outlook 2020 and Summer 2019 Review, Winter Supply Outlook 2020–2021 and Winter Supply 2019–2020 Review reports – which give an overview of the ability of the European network, storages and potential gas supply to meet market demand – were published in 2020.

Following a Gas Coordination Group request, an addendum was published to the Union-wide simulation of gas supply and infrastructure disruption scenarios (SoS simulation) report of October 2017. The main goal of this addendum was to evaluate the impact of the major infrastructure investments commissioned in 2019 – Balticconnector between Finland and Estonia and a new import capacity from Russia via Turkey to Bulgaria – on the natural gas security of supply in the region.

SYSTEM OPERATION INTEROPERABILITY AND TRANSPARENCY REQUIREMENTS

The Interoperability team undertook work in 2020 on two issues reported on the Functionality (FUNC) Platform – one relating to missing harmonisation of interfaces for communication with booking platforms (the solution of which was published in December 2020) and the other on the potential extension of the Business Requirements Specifications (BRS) by adding information about balancing processes.

In 2020, ENTSOG produced the updated edition of the gas quality outlook report for TYNDP 2020. ENTSOG continued cooperating with CEN, Marcogaz, EASEE-gas, GIE, and other industry associations in the field of gas quality and hydrogen handling. Furthermore, ENTSOG established, together with DSO organisations (Eurogas, Geode, CEDEC, GD4S) a dedicated prime movers' group on gas quality and hydrogen aspects for stakeholders of the gas value chain.

In 2020, ENTSOG produced the third Interoperability Network Code (INT & DE NC) Implementation Monitoring Report. Following a special request from

ACER, a detailed analysis of Interconnection Agreements (IAs) compliance with INT & DE NC for a first group of selected TSOs was undertaken.

ENTSOG is supporting activities relating to the European Commission's initiative on Methane Emissions Reduction, one of the urgent topics of the EU Green Deal agenda.

The ENTSOG Transparency Team and the Transparency Working Group undertook work in 2020 on improving the ENTSOG Transparency Platform (TP), maintaining and improving the continuous provisions of transparency information required by the Tariff (TAR), INT and Capacity Allocation Mechanism (CAM) Network Codes and Transparency Guidelines and the data provision required by REMIT. To support the users of the TP, a 14th workshop was organised online. Additionally, ENTSOG and the gas TSOs have been active in several EC and ACER fora discussing the continued implementation and improvements to REMIT, including REMIT Fees.

STRATEGY, POLICY AND COMMUNICATION

The G2020 Task Force facilitated the publication of the Roadmap Action Plan associated with ENTSOG's 2050 Roadmap for Gas Grids, which proposed how to make gas grids ready for energy transition by identifying three possible pathways (methane, blends and hydrogen) to achieve the EU Green Deal objective of a carbon-neutral energy system by 2050. This Roadmap Action Plan was developed with consideration of the European Commission's Energy System Integration and Hydrogen Strategies and identifies three key principles will reinforce European gas TSOs commitments to deliver on Europe's energy and climate objectives. These principles are delivering Europe's future energy networks (Infrastructure); having the same market principles for all gases including hydro-

gen (markets); and gas TSOs as system integrators in the emerging hybrid energy system.

In 2020, the TF also identified the relevant actions linked with ENTSOG Strategic topics, such as Energy System Integration, guarantees of origin/certificates, TEN-E revision, gas quality and hydrogen handling, methane emissions and regional cooperation. The TF, in cooperation with relevant WGs, monitored EU policy developments and provided regular updates to the ENTSOG Members, GA and ENTSOG Board. This work is to facilitate contributions to the upcoming package of Hydrogen and Gas markets Decarbonisation legislation.



Picture courtesy of Enagás

ENTSOG MANAGEMENT SUPPORT

In 2020, ENTSOG's Management Support team continued working with ENTSOG teams and management and working with ENTSOG members. Support was via the Legal, HR, Finance, IT and Administration functions to ensure a robust platform for the activities and deliverables of ENTSOG.

The ENTSOG Legal Team ensured the proper working of the day-to-day activities from the legal perspective, such as the support on the implementation of the existing Network Codes, and in some cases effect monitoring.

ENTSOG Human Resources continued with a well-prepared recruitment process, so that the relevant resources and competences were in place to perform the required activities.

Working with several IT providers, vendors and IT contractors, the IT Team plans, manages, builds and operates IT systems to support ENTSOG advisors and their activities. In 2020, they provided IT support to ENTSOG stakeholders in the use of ENTSOG's data and systems.

ENTSOG DELIVERABLES 2020

JANUARY

20 // ENTSOG first incremental capacity process cycle

MAY

06 // Gas TSOs of the Southern Corridor region – 4th edition of Gas Regional Investment Plan

11 // ENTSOG list of PS-CBA groups for TYNDP 2020

JUNE

23 // Gas TSOs of the North West Region – 4th edition of Gas Regional Investment Plan

29 // ENTSO-E and ENTSOG – final Joint Scenarios for TYNDP 2020

30 // Annual Report 2019

30 // Balancing Network Code (BAL NC) monitoring report

JAN

FEB

MAR

APR

MAY

JUN

FEBRUARY

24 // Gas TSOs of the Central Eastern Europe (CEE) region – Gas Regional Investment Plan 2019

APRIL

22 // ENTSOG second Tariff Network Code (TAR NC) monitoring report

27 // ENTSOG Summer Supply Outlook 2020 and Summer Supply Review 2019

OCTOBER

08 // Winter Supply Outlook 2020/21 and Winter Supply Review 2019/20

08 // ENTSOG 2050 Roadmap Action Plan

09 // 2020 Addendum to the Union-wide simulation of gas supply and infrastructure disruption scenarios (SoS simulation) report

DECEMBER

16 // ENTSOG Annual Work Programme 2021

JUL

AUG

SEP

OCT

NOV

DEC

AUGUST

07 // Third Interoperability and Data Exchange Rules Network Code Implementation (INT & DE NC) monitoring report

NOVEMBER

25 // Draft TYNDP 2020

WORK PROGRAMME STATUS

These tables provide an overview of the activities in ENTSOG's four main business areas – Market, System Development, System Operation and Strategy, Policy and Communication (SPC). The listed tasks originate (and are supplemented in some cases) from the Annual Work Programme 2020. The SPC business area was launched in Q3 of 2019 and therefore did not include planned activities in AWP 2020 – activities for 2020 have nonetheless been specified.

MARKET

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/ Comments
MARKET NETWORKS CODES AND GUIDELINES				
Provide opinion and/or responses on issued reports, public consultations and papers.	Support members and stakeholders	Ongoing through 2020	TSOs	Ongoing
BALANCING				
Support ENTSOG members with the implementation of the BAL NC	Successful implementation of the BAL NC provisions by ENTSOG members	Ongoing throughout 2020	TSOs	Ongoing
Publish the BAL NC implementation and effect monitoring report	Monitor the implementation and effects of the BAL NC	Publication on ENTSOG website in June 2020	TSOs and ACER	Completed
Collaboration with ENTSOG Legal Area in developing recommendations and monitoring cases of suspected misconduct in balancing zones, working in close dialogue with relevant stakeholders.	Raise awareness internally and externally on suspected misconduct in EU balancing zones and propose solutions to address it	Publication of ACER-ENTSOG Joint Policy Paper with Recommendations in February 2021	TSOs and ACER	Completed
TARIFFS				
Support ENTSOG members with the implementation of the TAR NC	Successful implementation of the TAR NC provisions by ENTSOG members	Ongoing throughout 2020	TSOs	Ongoing
Respond to queries from Members and stakeholders on tariff issues	Reply to requests, on topics such as implementation of the TAR NC or good practices in Europe, in a timely manner	Ongoing through 2020	TSOs, stakeholders	Ongoing
Publish the 2 nd TAR NC implementation and effect monitoring report	Monitor the implementation and effects of the TAR NC	Publication on 22 April 2020	TSOs, ACER	Completed
Develop ENTSOG positions on tariff related issues and respond to consultations and queries from stakeholders (e.g., response to ACER's Public Consultation on Multipliers in Nov. 2020)	Develop sound ENTSOG positions on tariff related issues that can be presented to stakeholders and the wider market, as well as internal material aimed at analysing the evolution of tariffs and revenues.	Ongoing throughout 2020	TSOs, stakeholders, ACER	Ongoing
Participation in external events on tariffs (e.g., ACER's webinars on tariffs in Sep. 2020)	Present ENTSOG's positions and results regarding tariffs towards external stakeholders	Ongoing throughout 2020	TSOs, stakeholders, ACER	Ongoing

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/ Comments
CAPACITY				
Support ENTSOG members with the implementation of the CAM NC	Successful implementation of the CAM NC provisions by ENTSOG members	Ongoing throughout 2020	TSOs	Ongoing
Development of CAM NC auction calendar 2021/2022	Publish the auction calendar for 2020/2021	Publication on 21 January 2021	TSOs	Completed
Develop the CMP GL and CAM NC implementation and effect monitoring reports covering gas years 2018/2019 and 2019/2020	Monitor the implementation and effects of the CAM NC and CMP GL	To be published on ENTSOG website in Q2 2021.	TSOs	Ongoing
Respond to ACERs 7 th contractual congestion report covering 2019	Analyse the report and provide feedback	Response sent to ACER 10 December 2020	TSOs	Completed
FUNCTIONALITY				
Support the Functionality Process and any related issues to the Network Codes and Guidelines that arise	Provide assistance to the successful establishment and operation of the Functionality Process	Ongoing	Stakeholders, TSOs, ACER	Ongoing
Improve the Functionality Process and Functionality Platform	Improve the Functionality process by updating the guidelines for cooperation with ACER and Terms of Use of the Functionality Platform. Improve the Platform itself with a new design and more user-friendly features.	New Platform was launched in July 2020, based on Guidelines and Terms of Use updated during 2019	TSOs, ACER	Completed
MARKET DEVELOPMENT				
Evaluate any proposed changes to the current regulatory framework in the EU gas sector and provide feedback.	Ensure that the stakeholders (including the EC) are aware of ENTSOG's positions and views regarding the legislative and policy proposals developed for the EU gas sector	Ongoing throughout 2020	TSOs, EC, stakeholders	Ongoing
Develop positions and recommendations that will facilitate the use of power-to-gas technologies and the use of renewable gases in transport, heating and industry	Ensure that stakeholders understand how the gas grids can contribute to decarbonisation and the energy transition in different sectors of the EU economy	Ongoing throughout 2020	TSOs, EC, stakeholders	Ongoing
Provide support to ENTSOG Members regarding the development of any new TSO products and services which can contribute towards meeting decarbonisation and EU climate neutrality targets	Develop positions on the measures that are needed at the national levels to facilitate deployment of the new 'climate oriented' TSO products and services	Ad-hoc work stream (upon requests of TSOs)	TSOs, stakeholders	Ongoing

SYSTEM DEVELOPMENT

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
TYNDP 2020	Assess the infrastructure against the European Energy Policies to identify infrastructure gaps and mitigation of these gaps by projects on the basis of the CBA Methodology in force.	<p>Draft TYNDP 2020 System Assessment (completed);</p> <p>Draft TYNDP 2020 Infrastructure Report (completed);</p> <p>Inclusion of Energy Transition projects in TYNDP 2020 (completed);</p> <p>Draft TYNDP 2020 map (completed);</p> <p>Relevant draft TYNDP 2020 Annexes (completed);</p> <p>Dedicated TYNDP website including visualization platform for intuitive and transparent use of the results. (completed)</p>	<p>Stakeholders, ACER;</p> <p>Public consultation; TYNDP Presentation Day on 16 December 2020.</p>	<p>Draft TYNDP 2020 published in November 2020.</p> <p>To be completed taking into account the outcome of the public consultation and the opinion received from ACER.</p>
Support to Regional Groups	<p>Provide technical expertise during the 5th PCI selection process.</p> <p>Support promoters on CBA at project level by modelling and producing Project Fiches</p>	<p>Contribution to the EC/ACER/ENTSOs Cooperation Platform for the 5th PCI selection process;</p> <p>Operationalisation of the PCI call using ENTSOG Project portal (completed);</p> <p>Prepare Project Fiches for the 5th PCI selection process (completed)</p>	<p>EC</p> <p>ACER</p> <p>TSOs</p>	<p>Support to 5th PCI selection process started in November 2020 and will be ongoing for all 2021.</p> <p>Project-Specific results and related project fiches were published in January 2021.</p>
ENTSO-E/ENTSOG consistent and interlinked model	ENTSOG and ENTSO-E to implement a project screening methodology, taking into account the outcomes of the Artelys Focus Study as well as to develop a dual assessment methodology (ongoing)	<p>Definition of methodology principles (completed);</p> <p>Stakeholder engagement (ongoing in first months of 2021).</p>	<p>Prime Movers.</p> <p>EC</p> <p>ACER</p> <p>TSOs</p> <p>Copenhagen Infrastructure Forum</p> <p>Madrid gas Forum</p>	ENTSOG and ENTSO-E to implement a project screening methodology, taking into account the outcomes of the Artelys Focus Study as well as to develop a dual assessment methodology (ongoing)
TYNDP 2020 scenario development process	Joint scenario development process between both ENTSOs	<p>Draft TYNDP 2020 joint scenario report (ENTSOG/ENTSO-E);</p> <p>Published in June 2020</p>	<p>TSOs</p> <p>TYNDP 2020 scenarios consulted with EC, ACER, external stakeholders</p>	Final Report published in June 2020

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
2 nd CBA Methodology	For TYNDP 2020, application of ENTSOG 2 nd CBA methodology, whose final version was published on 23 October 2018 and approved by EC on 17 January 2019.	Application of ENTSOG 2 nd CBA Methodology to TYNDP 2020 Implementation of the sustainability indicator developed by Trinmoics/Artelys for the European Commission. (completed)	N/A	Completed
Summer Outlook 2020	Provide view on injection period ahead	Publication	TSOs, ACER	Completed
Summer Review 2019	Analyse previous summer	Publication	TSOs	Completed
Winter Outlook 2020/21	Provide view on supply-and-demand balance for winter ahead	Publication	TSOs, ACER	Completed
Winter Review 2019/20	Analyse previous winter	Publication	TSOs	Completed
System Development Map (periodical)	Provide project map and graphic representation of supply-and-demand for past year	Publication	TSOs	Approved in December 2020 and published in January 2021

SYSTEM OPERATION

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
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TRANSPARENCY

Data consistency support to TSOs	Ensure a high data completeness and consistency on the TP	ENTSOG staff monitors the data publications daily and reports to the TSOs on a monthly basis.	Gas TSOs	Over the course of the year, data completeness has continuously improved and is stable around 94 %.
Continuous platform improvements	Ensure user friendliness and usability of the published data	In 2020, new features were implemented and presented at the public workshop	Gas TSOs and TP Users	Ongoing
Facilitate required data collection processes	Ensure timely and effective data deliveries	The data needed for ACER's monitoring obligations was delivered on 14 February 2020.	Gas TSOs, ACER Gas Market Department	Completed
Follow up on REMIT requirements	Ensure proper application of REMIT requirements	Ongoing effort	Gas TSOs, ACER REMIT department, ACER REMIT User groups	ENTSOG and gas TSOs have participated in numerous discussions in the REMIT area in 2020, including significant discussions on REMIT Fees. The updated ACER requirements for REMIT implementation have been considered and implemented, if relevant.

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
Discuss updated UMM concept	Ensure good practice and integrity for publication of inside information as UMMs	ENTSOG discussed the existing UMM-setup amongst the members and updated internal governance rules.	Gas TSOs, ACER REMIT department	The TP has been approved as eligible for IIP services, alongside with 14 other IIPs on ACER's REMIT portal. Phase two testing commences in 2021.
Analyse legal transparency requirements coming from EU legislation, including the gas Network Codes	Ensure proper application of the transparency requirements	Ongoing effort	Gas TSOs, EC, TP users and other stakeholders	Ongoing
Cooperate with ENTSOG business areas to fulfil transparency requirements coming from relevant NCs	Ensure proper application of the publication requirements	Ongoing effort	Gas TSOs, other ENTSOG Working Groups, TP users and other stakeholders	Ongoing
Facilitate and support other areas inside ENTSOG with projects concerning TP	Ensure good usage of the available data and functionalities on the TP	N/A	Gas TSOs, other ENTSOG Working Groups,	Ongoing
Stakeholder satisfaction survey on the TP	Ensure a transparent and user-friendly channel for providing feedback on using the TP	The survey responses were evaluated by ENTSOG TRA WG and presented at the 14 th public Transparency workshop	Gas TSOs, TP users, ACER, EC, and other stakeholders	Completed Besides the stakeholder satisfaction survey, around 500 questions from TP users were handled by ENTSOG and TSO staff in 2020.
Public workshop on Transparency	Ensure transparent dialog with stakeholders	Workshop was held on 19 November 2020 online, with 70 participants and 14 presenters.	Gas TSOs, TP users, ACER, EC, and other stakeholders	Completed
Develop ENTSOG and gas TSOs' positions on transparency and REMIT related issues and respond to reports from stakeholders	Develop positions on transparency and REMIT related issues that can be presented to stakeholders	Ongoing effort	Gas TSOs, ACER, other stakeholders	In 2020, TSOs engaged in many dialogues on the methodology for REMIT fees, aimed at ensuring a fair and non-discriminatory approach. This included contribution to the EC public consultation, engagement in roundtables and presentation of the position of ENTSOG and the TSOs at ACER's EMIT Forum. At the same forum, the vision for the implementation of the Green Deal and contributions to a fossil-free EU in 2050 was presented.

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
INTEROPERABILITY AND DATA EXCHANGE				
Follow up on INT & DE NC implementation monitoring	Monitor the implementation and functioning of the Network Code on Interoperability and Data Exchange Rules	Implementation monitoring report 2020 with a detailed analysis of IAs compliance with INT INT & DE NC for a selected group of TSOs – will be published in the second half of 2021.	TSOs, ACER	Next part of monitoring exercise planned for the end 2021
Continue discussion on gas quality and H ₂ handling	Develop understanding of how H ₂ might be introduced in the gas grids	Ongoing	TSOs	Set out ENTSOG's current understanding of the opportunities and challenges on increased penetration of hydrogen in gas grids
Continue discussion on gas quality standardisation with CEN	Cooperate with gas sector regarding gas quality standard and regulation	Contribute towards the revision of EN 16726 to include WI	Stakeholders from the whole gas value chain	ENTSOG continues cooperating with CEN
Continue discussion on gas quality with industry associations	Cooperate with gas sector regarding gas quality standard and regulation	Ongoing	Stakeholders from the whole gas value chain	Marcogaz, EASEE-gas and other industry associations in this field.
Prime movers' group on GQ & H ₂ handling	Assess the need for new or updated tools to efficiently ensure system interoperability, security of supply and meet end-users' needs and safety requirements	Ongoing (Q3/Q4 2021)	Stakeholders from the whole gas value chain	Eventually reach a consensus on the main principles for handling gas quality and hydrogen. Joint initiative facilitated by ENTSOG with DSOs associations (CEDEC, Eurogas, GEODE, GD4S)
Facilitating WI framework discussion	Reliable WI framework is a must for the proper implementation of the CEN SFGas GQS proposal in the CEN gas quality standard EN 16726	Ongoing	Stakeholders from the whole gas value chain	ENTSOG is facilitating the discussion and development of recommendations to facilitate the setting of basic rules and procedures needed for the implementation of the CEN WI exit classification system proposal from CEN SFGas GQS TF1/CAG proposal on Wobbe index
Follow up on the SoS and Technical cooperation	Follow up on the existing ReCo System for Gas as a CNOT for emergency conditions	Ongoing	N/A	Ongoing
Follow up on technical cooperation with third-country TSOs	Continue cooperating with Energy Community and third-country TSOs	External contact platform meetings twice per year.	EnC secretariat and stakeholders	Ongoing
Follow up on data exchange	Manage and review CNOTs	Review of the changes coming from the FUNC issue to include VTPs and Capacity Booking Platform Operators in the INT & DE NC.	ACER, TSOs, SSOs, Market Area Managers, Capacity Booking Platform Operators, and network users	ACER and ENTSOG have published the solution for the reported FUNC issue on this topic and provided an amendment of the Common Data Exchange Solution Table as part of the CNOTs considering the input provided by the market participants via a public consultation.

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
Follow up on data exchange	Organise Data Exchange workshop	Data Exchange workshop December 2020	EASEE-gas, CEF	A new edition of the data exchange workshop was held on 1 December 2020
Continuation of the dialogue with stakeholders on European and national level in order to establish a common security algorithms for AS4	Initiate a dialogue with the relevant stakeholders	ENTSOG has started a series of workshops with representatives from BSI, BDEW, EASEE-gas and CEF in order to analyse the way forward towards a European roadmap for common security algorithms.	BSI, BDEW, EASEE-gas, CEF	Further discussions and review of the analysis planned throughout 2021
Follow up on EIC scheme	Deliver Local Issuing Office service	Ongoing	N/A	Further cooperation with ENTSOE (CIO) and other LIOs from the gas sector on the possible amendment of EIC functions & definitions
Cooperation with GIE and Marcogaz, organisation of joined webinars for dissemination of information on the progress of EC's methane emissions reduction strategy		Ongoing process of dissemination of information on the progress of EC's methane emissions reduction strategy	GIE, Marcogaz, GERG	Ongoing established communication and work processes
Cooperation with CAMEO project and with German Aerospace Center on requirements for methane emissions monitoring and measurement		Organisation of joined webinars; follow up of projects development, expert support, and discussion of requirements for monitoring and measurement of methane emissions	CAMEO project representatives, German Aerospace Centre scientists, GIE, Marcogaz, GERG	An initial phase of establishing communication and work processes. Discussion of the cooperation agreement conditions and requirements
Cooperation with CAMEO project and with German Aerospace Center on requirements for methane emissions monitoring and measurement		Organisation of joined webinars; follow up of projects development, expert support, and discussion of requirements for monitoring and measurement of methane emissions	CAMEO project representatives, German Aerospace Centre scientists, GIE, Marcogaz, GERG	An initial phase of establishing communication and work processes. Discussion of the cooperation agreement conditions and requirements

STRATEGY, POLICY AND COMMUNICATION

Activity	Goal	Deliverables & Completion Date	Consultation with	Status/Comments
ENTSOG 2050 Roadmap for Gas Grids	Develop ENTSOG 2050 Roadmap Action Plan	From January until publication on 8 December 2020	TSOs	Completed
	Engage in the European Clean Hydrogen Alliance	Q3-Q4 2020	TSOs	Established and ongoing
	Preparation work to establish an Advisory Panel for Future Gas Grids	Q4 2020	TSOs	Established and ongoing
	Establish a Joint Advisory Panel for Scenarios	Q2 2021	TSOs	Ongoing
	Establish a Prime Mover Group on Gas Quality and Hydrogen Handling	Q2 2020	TSOs	Ongoing
	Engage in the EU SET Plan's Action 6	Q2-Q4 2020	TSOs	Ongoing
	Continue Prime Mover Group on GOs and Certificates	Q1 2020	TSOs	Ongoing
Identify strategic focus areas for ENTSOG under the European Green Deal	Relate to relevant legislative actions, policy communications, action plans announced by the EC or other, as requested by the ENTSOG Board.	Ongoing throughout 2020	TSOs	Ongoing
Policy proposals and updates	<p>Monitor key energy & climate policy/ regulatory developments put forward by EU institutions.</p> <p>Map the priorities of the European Commission and European Parliament.</p> <p>Discuss and engage with Members on EU's analytical work (EC consultations and studies).</p> <p>Mapping the priorities of the Commission and Parliament established in 2020.</p>	Ongoing throughout 2020	TSOs	Ongoing
Communication proposals	<p>Provide recommendations on ENTSOG's priorities in dialogue with the European Commission, Parliament and ACER.</p> <p>Propose external and internal communication.</p> <p>Engage in dialogue with industry, gas and other key EU stakeholders.</p>	Ongoing throughout 2020	TSOs	Ongoing
Information sharing	<p>Provide information material to TSOs in their discussions on gas regulatory framework held at national level.</p> <p>Report to Members on all ENTSOG bilateral, multilateral and public engagement</p>	Ongoing throughout 2020	TSOs	Ongoing

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MARKET NETWORK CODES AND GUIDELINES AND MARKET DEVELOPMENT



ENTSOG's Market Team is responsible for providing expertise, monitoring and development of the market-related Network Codes that promote the internal European gas market. The Market Area has also been involved with the Energy Community, providing support in their Network Code development and implementation activities.

In addition to work on the Network Codes, the Market Area is also responsible for the jointly managed ACER and ENTSOG Functionality Process, which addresses not only potential adjustments to the implementation of Network Codes, but also to include possible issues which might require future Network Code adaptations.

The Market team also contribute with proposals and analysis of the impact of possible changes to the

current regulatory framework for the EU gas market (including hydrogen) and Energy System Integration related activities. Work in 2020 was undertaken to envision what innovative TSOs solutions could support the achievement of the EU goals of climate neutrality and energy transition, competitiveness, security of supply and sustainability and to assess their possible impacts on the functioning of the internal gas market.

WORK STRUCTURE

The work within the Market Area is organised into two main areas – the Market Codes Working Group (MC WG) and the Market Development Working Group (MD WG).



Figure 2: Market Codes and Market Development Working Group and associated KGs

MARKET CODES

The MC WG is responsible for ENTSOG's activities related to balancing, capacity and tariffs. This includes all topics relating to the CAM NC and the Guidelines on CMP, BAL NC and TAR NC, as well as any further regulation possibly upcoming in relation with these areas.

The work within the MC WG is managed via their corresponding KGs, with more specialised tasks. The activities of BAL, CAP and TAR KGs are coordinated through the MC WG.

The MC WG meet on a monthly basis (and ad-hoc, as required) and comprise participants representing Member TSOs across Europe.

The work areas addressed in the Kernel Groups are as follows:

CAPACITY

The Capacity KG (CAPKG) is responsible for ENTSOG's activities related to the allocation of existing and incremental capacity (CAM NC - REG (EU) No 2017/459) and congestion management (Guidelines on CMP - Commission Decision of 24 August 2012 on amending Annex I to Regulation (EC) No 715/2009). The CAP KG has also been responsible for ENTSOG's activities related to implementation and operational issues raised



on the Functionality Platform that are connected to CAM NC or CMP GLs.

Furthermore, the CAP KG is responsible for the monitoring of CAM NC and the CMP GLs and developing monitoring reports on the implementation and effect of the CAM NC and CMP GLs. The CAP KG also analyses and provides feedback to ACER's monitoring reports on the same topics, where necessary.

Where requested, the CAP KG provides appropriate input to the update of Common Network Operation Tools (CNOT) – comprising Business Requirements Specifications (BRS) for the CAM NC and the CMP GLs document and Message Implementation Guideline (MIG).

BALANCING

The Balancing KG (BAL KG) is responsible for ENTSOG's tasks related to balancing activities in transmission systems, with a focus on the implementation, application and functioning of the Network Code on Gas Balancing of Transmission Networks

(BAL NC – REG (EU) No 312/2014). The BAL KG is responsible for providing expert knowledge and guidance to ENTSOG members and external parties on balancing-related topics. One key activity, among others, is developing the report on the implementation and the effect monitoring of BAL NC.

Where requested, the BAL KG also provides appropriate input to the update of CNOTs and contributes to the development of issues solution related to BAL in the Functionality Process.

TARIFFS

The Tariff (TAR KG) is responsible for providing expertise, monitoring and development of the Tariff Network Code (TAR NC).

In 2020, the TAR KG was convened several times, in particular to finalise the 2nd TAR NC Implementation and Effect monitoring report, which was published on 22 April 2020, and also to prepare the ENTSOG answer to ACER's Public Consultation on multipliers in November 2020.

MARKET DEVELOPMENT

The MD WG is responsible for developing ENTSOG's proposals for the future gas market design (including hydrogen), so that these proposals can be fed into work undertaken by the EC and used to discuss future developments with stakeholders. Going forward, the MD WG will also contribute with inputs and proposals to the gas-related topics of the new regulatory packages, developed to achieve the ECs Green Deal's objectives.

The GO Kernel Group deals most specifically with Guarantees of Origin and works with other associations within a so-called "Prime Movers" Group.

The MD WG meet on a monthly basis (and ad-hoc, as required) and comprise participants representing Member TSOs across Europe.

ACTIVITIES

MARKET CODES

In 2020, the MC WG, in collaboration with the ENTSOG Legal Advisory Group (LAG), continued the work and the dialogue initiated in 2019 with ACER and the EC about the recent suspected balancing misconduct cases which occurred in Europe. A coordinated work between ACER and ENTSOG started in January 2020 to elaborate a joint paper outlining recommendations for the correct implementation of the European balancing regulatory framework. A public consultation was held from 21 September to 3 November 2020 on the draft paper, which resulted in the final policy paper published in February 2021.

The MC Brussels team was involved as experts for the online course 'EU Gas Network Codes' organised by ENTSOG and the Florence School of Regulation on several subjects: Capacity, Balancing, and Tariffs.

CAPACITY KERNEL GROUP Capacity Allocation Mechanisms

ENTSOG prepared the annual auction calendar in 2020 for the gas year 2021/2022 with publication date on January 2021.

In November 2020, ENTSOG started the data collection and the drafting of the Implementation and Effect Monitoring Reports for CAM NC and CMP GL with publication date Q2 2021.

In addition, ENTSOG continue the monitoring of the incremental capacity process by collecting and publishing information on the joint consultations for the incremental capacity process initiated in 2019.

BALANCING KERNEL GROUP

The Balancing Network Code (Commission Regulation (EU) No 312/2014) was published in the Official Journal of the EU in March 2014 with a first implementation deadline as of 1 October 2015. However, according to Article 52(1), the application could be postponed until 1 October 2016, if approved by the NRA and provided that no interim measures were applied. As a third option, the BAL NC allowed TSOs to apply interim measures according to Articles 45–50 in the absence of sufficient liquidity on the short-term wholesale market and upon approval by the NRA. Article 45(4) set April 2019 as the deadline for the termination of interim measures.

Following its monitoring obligation set out in Article 8 (8) of the Regulation (EC) No 715/2009 and to assess the implementation plans of the individual TSOs, the BAL KG developed the BAL NC Implementation and Effect monitoring report, which was published in June 2020.

TARIFF KERNEL GROUP

In 2020, the TAR KG continued supporting ENTSOG members with the implementation of the TAR NC.

The TAR KG finalised the 2nd TAR NC Implementation and Effect Monitoring Report after collecting and analysing data of the implementation monitoring part and after calculating and assessing the relevant indicators for the effect monitoring part. The required data was analysed, and work on the report ended in the first quarter of 2020. The report was published in April 2020.

The TAR KG was also in charge of drafting the response to ACER's Public Consultation on multipliers in November–December 2020. TSOs exchanged views and made proposals to respond to ACER's questionnaire, which was also to inform its views on the need to adjust multiplier ranges in the TAR NC for day-ahead and within-day products. By 1 April 2021, ACER may issue a recommendation to reduce the cap of these multipliers from 3.0 to 1.5, as stipulated by the TAR NC. ENTSOG's reply was submitted to ACER in December 2020 and advocated not to reduce this cap, especially since multipliers across Europe have started converging, based on comparative results from ENTSOG's TAR monitoring reports published in 2018 and 2020.

The TAR Brussels team also discussed tariff issues with stakeholders such as ACER, the Florence School of Regulation (FSR) and the EC. It attended events organised by external stakeholders.

JOINT NETWORK CODE FUNCTIONALITY PROCESS

The established Joint Functionality Process, co-managed by ENTSOG and ACER and supported by the EC, is aimed at reaching commonly recommended solution(s) on implementation and operational issues within the existing Network Codes and Guidelines. It provides stakeholders a possibility to raise and discuss issues as well as an opportunity to be involved in developing solutions, which aim at commonly recommended non-binding guidance.

Issue poster	Description	Status
Equinor ASA + ENGIE	Missing harmonisation of interfaces on capacity booking platforms	Solved
Equinor ASA	BRS for balancing	In progress
AGGM	Auction restrictions in the NCG market area	Solved
EFET	Greater harmonisation of fallback procedures	Solved
EFET	Greater flexibility to book firm capacity at IPs	In progress
EASEE-gas	Dutch TSO requirement of message PRODOC is unnecessary and contrary to BAL NC	In progress

The Gas Network Codes Functionality Platform (www.gasncfunc.eu) enables stakeholders to raise implementation and operation issues via the web interface and gives an overview of all reported issues and their status. Since its introduction in 2016, the perceived limited scope – only Network Code implementation, functional or operational issues could have been raised on the platform – was outlined as a potential barrier to submission of Network Code related issues. Therefore, in the Summer of 2017, in conjunction with ACER, the scope of the Functionality Process was broadened so as to allow any issue related to the Network Codes to be included. In addition, the number of potential Network Codes and Guidelines was also expanded to include the Transparency Guidelines and the TAR NC.

In July 2018, the first issue solution was published on the Functionality Platform, related to Ex-post interruptible capacity discounts. During 2020, four issues have been solved or closed and two new issues have

been posted. The table below outlines the status of all the issues which have been discussed, solved or posted on the platform during 2020. Some issues were posted by more than one stakeholder – in those cases the issues were processed jointly but remained as separate issues on the Platform itself.

From the first stakeholder issue on the platform at the end of 2017 until the publication of the first issue solution in July 2018, improvement suggestions to the platform and process were analysed by ACER and ENTSOG and transformed into project steps. This project continued during 2019 and in Q4 2019, the technical specifications for improvements to the Platform were finalised and consultants were appointed to carry out the necessary IT modifications. The project was finalised in July 2020 with the launch of the updated FUNC Platform, aimed at making the Functionality Process more efficient, transparent, and smoother to use for the involved stakeholders.

MARKET DEVELOPMENT

In 2020, the MD WG continued to evaluate relevant policy and legislative initiatives in the EU gas sector and examined innovative TSO solutions which could facilitate the energy transition whilst maintaining security of supply and promoting competition. MD WG also contributed to the development of ENTSOG's 2050 Action Plan with the relevant proposals on:

- 1) integration of renewable and decarbonised gases into EU internal gas market
- 2) development of a hybrid energy system, including power-to-gas business model
- 3) trade in the 'climate value' of renewable and decarbonised gases across Member States and
- 4) prospects for deploying Carbon Capture, Utilisation and Storage (CCUS) technologies.

The MD WG's primary focus and workload throughout 2020 was developing positions and views in relation to anticipated legislative changes of the EU gas market, and the gas grids contribution towards decarbonising

the energy sector. In particular, the MD WG organised a workshop in March 2020 to exchange views with stakeholders on these topics. MD WG responded to consultations from the Commission such as the ones related to the Energy System Integration and Hydrogen Strategies. The MD WG also reviewed external reports during public consultations and provided ENTSOG positions for instance regarding Trinomics' study on hydrogen regulation.

Regarding the climate value, the GO Prime Movers group made recommendations during the Madrid Forum on the 14–15 October on the revision of the Renewable Energy Directive (RED II revision) in order to develop an EU wide GO market. The Market Development team also participated in the first workshop from DG ENER on the topic (11 December). During the year, the Market Development team in coordination with the GO KG engaged in the CEN process to revise the standard on GO and developed a letter signed by several gas associations to DG CLIMA about the revision of the EU ETS Monitoring and Reporting Regulation.



MARKET NETWORK CODES IMPLEMENTATION AND EFFECT MONITORING

For the Market Area, ENTSOG is required to publish monitoring reports, on implementation as well as on effects of the CAM NC, TAR NC, BAL NC and CMP GLs. The monitoring requirements differ for the different Network Codes when it comes to how often the re-

ports have to be published and when. In 2020, ENTSOG produced the CAM NC and CMP GL monitoring reports as specifically required by the Network Code text. Further details are provided below.

CAM NC IMPLEMENTATION MONITORING

The main aim of the CAM NC is to achieve the harmonisation of capacity allocation at all interconnection points across the European Union and to guarantee a non-discriminatory third-party access to the gas networks as well as to promote the cooperation between adjacent transmission operators.

In order to determine whether the aims of the CAM NC have been reached, ENTSOG has monitored for the fifth time the implementation status of the CAM NC by 43 EU TSOs (39 ENTSOG members out of 44¹⁾, 2 associated partners²⁾ and 2 non-ENTSOG members). The report produced covers the status of implementation at the end of calendar year 2020, except for the provisions corresponding to Chapter V of the CAM NC on the Incremental Capacity Process. This Chapter will be assessed in a separated report covering the incremental capacity process initiated in 2019 and it is expected to be published during the second half of 2021.

By the analysis of the TSOs' data, it can be concluded that good progress has been made towards the full implementation of CAM NC provisions in comparison to the previous monitoring report. The main improvement is related to the implementation of Virtual Interconnection Points (VIPs) since ten VIPs, out of 11, which were not implemented in 2018, have been implemented in the calendar years 2019 and 2020. Moreover, Art. 32 (6–7) has now been implemented by all TSOs³⁾, except for those for which this Article is not applicable.

To conclude, almost all the TSOs have fully implemented all the Articles of the CAM NC. However, further improvement is still required by a small number of TSOs to fully implement all the articles of the CAM NC.

1) In the period covered, ENTSOG had 44 members. Four ENTSOG members (Infrastrutture Trasporto Gas SpA, Società Gasdotti Italia S.p.A., Swedegas AB and Regasificadora del Noroeste S.A.) have been excluded from the scope of the CAM implementation monitoring because they have no interconnection points in their network. A fifth TSO (Creos Luxembourg S.A.) has not been considered since it holds derogation and additionally only has a non CAM-relevant IP.

2) In the period covered by this report, Conexus Baltic Grid and Elering AS were associated partners. Conexus subsequently became an ENTSOG member on 1 January 2021.

3) At the end of 2018, five TSOs were in the process of implementing Art. 32 (6-7) of CAM NC.

CAM NC EFFECT MONITORING

For the fourth time, ENTSOG has analysed the impact of the CAM NC on the European gas market by means of three indicators which were already used in previous editions of the CAM EM report and one new sub indicator. These indicators have been calculated for the Gas Years (GYs) 2018/2019 and 2019/2020 and compared with historical data, when available. Furthermore,

only IPs which are CAM-relevant on both sides of the IPs have been considered.

A total of 38 TSOs (36 ENTSOG members¹⁾ and 2 TSOs that are non-ENTSOG members) participated in this monitoring exercise.

EFFECT MONITORING INDICATORS AND THEIR RESULTS

CAM.1: Ratio of bundled firm capacity allocated over the total firm capacity allocated

This indicator shows the ratio of allocated bundled capacity over the total firm capacity allocated (bundled and unbundled firm capacity) per capacity product

type (yearly, quarterly, monthly and daily firm capacity products in MW).

Product	Yearly	Quarterly	Monthly	Daily
Year 2015/2016				
Bundled firm capacity	25,369.20	1,054.10	6,408.70	9,056
Total firm capacity	80,892.40	12,937.90	22,999.90	28,425
Ratio	31.36 %	8.15 %	27.86 %	31.86 %
Year 2016/2017*				
Bundled firm capacity	2,535,733	13,766	16,866	6,182
Total firm capacity	3,358,315	17,944	30,855	36,751
Ratio	75.51 %	76.72 %	54.66 %	20.24 %
Year 2017/2018				
Bundled firm capacity	121,026	24,611	56,076	13,868
Total firm capacity	194,987	40,467	88,162	44,125
Ratio	62.07 %	60.82 %	63.61 %	31.43 %
Year 2018/2019				
Bundled firm capacity	146,100	61,280	25,363	20,148
Total firm capacity	241,222	75,777	34,956	37,908
Ratio	61 %	81 %	73 %	53 %
Year 2019/2020				
Bundled firm capacity	192,521	18,843	17,630	19,330
Total firm capacity	281,001	65,777	42,272	36,424
Ratio	68.51 %	28.65 %	41.71 %	53.07 %

* Exceptional booking behaviour for this gas year due to exceptional long-term bookings in Germany, Czechia and Slovakia.

1) 8 ENTSOG members and 2 associated partners were excluded from this analysis since they have either been granted derogation under Art. 39 of the Gas Directive, use the implicit allocation method, have no interconnection points or the interconnection point is not CAM-relevant on both sides of the IP.

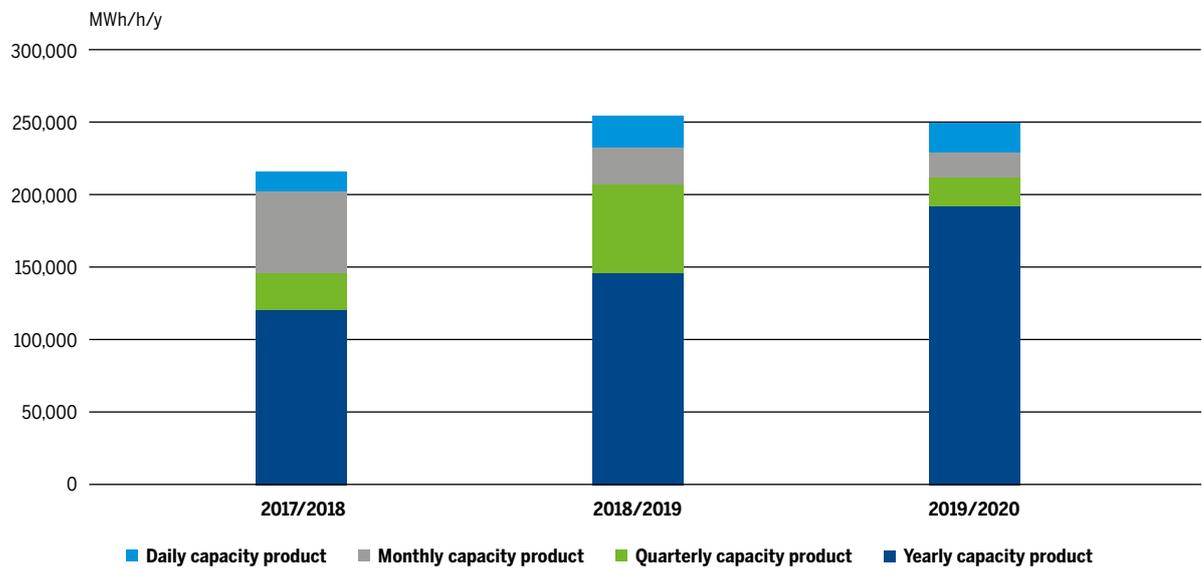


Figure 3: Bundled firm capacity allocated

By the analysis of this indicator, it has been observed that the allocation of quarterly, monthly and daily bundled firm capacity products related to the total firm capacity allocated for the GY 2018/2019 is 20 %, 9 % and 19% percentage points higher, respectively, than for the previous gas year. For the GY 2019/2020 the percentages for the quarterly and monthly standard capacity products are significantly lower than for the

GY 2018/2019. Nevertheless, there was an increase of yearly bundled firm capacity allocated.

When excluding unbundled firm capacity and therefore considering only the total bundled firm capacity, it is observed that more bundled firm capacity has been allocated in the last two GYs compared to the GY 2017/2018.

CAM.2: Share of secondary market-traded bundled capacity to secondary market traded total firm capacity

Indicator CAM.2 is used to show the share of bundled firm capacity traded on the secondary market in relation to the total amount of firm capacity (bundled and unbundled) traded on the secondary market.

Gas year (in MWh/h/y)	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Bundled firm capacity traded	511.40	13,369.00	1,835.00	10,339.54	9,520.33
Unbundled firm capacity traded	134,817.70	2,117,264.00	461,692.00	167,389.68	349,919.86
Total firm capacity traded	135,329.10	2,130,633.00	463,527.00	177,729.22	359,440.19
Ratio	0,38 %	0,63 %	0,40 %	5,82 %	2,65 %

Results obtained for CAM.2 show that the share of bundled capacity reallocated by secondary market trades is marginal: 5.82 % and 2.65 % for the GYs 2018/2019 and 2019/2020 respectively. Nevertheless, the values of the ratios for CAM.2 have increased for the last two GYs compared to the past, indicating that more capacity has been traded as bundled on the sec-

ondary market in relation to the unbundled capacity traded. Moreover, less unbundled firm capacity was traded in the last two GYs compared to the GY 2017/2018 while there was an increase of the bundled firm capacity compared to this GY, as it can be observed in the graphs below.

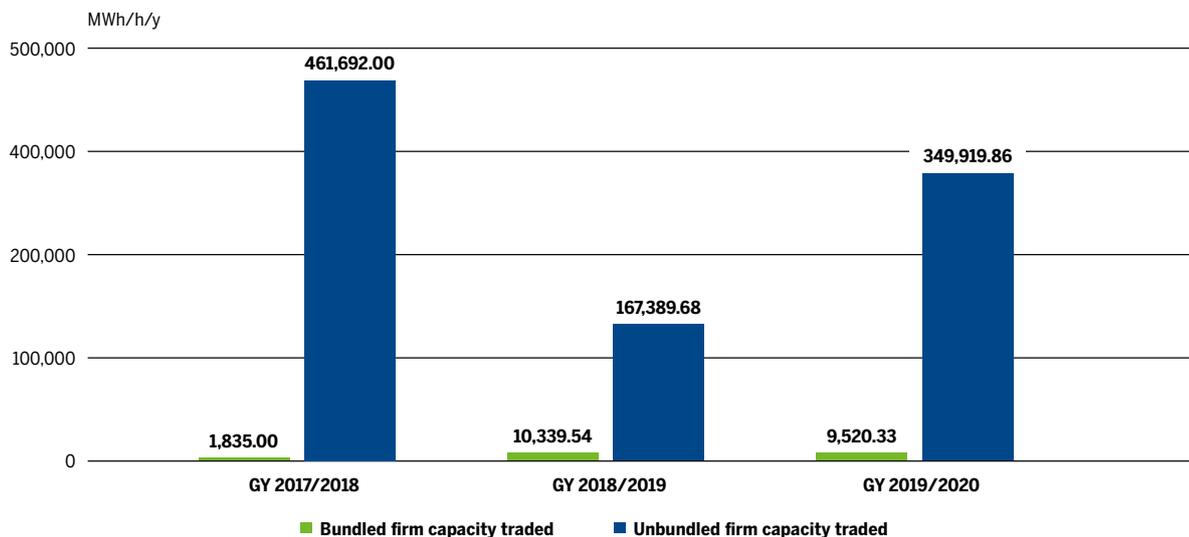


Figure 4: Bundled firm capacity traded on the secondary market related to unbundled firm capacity

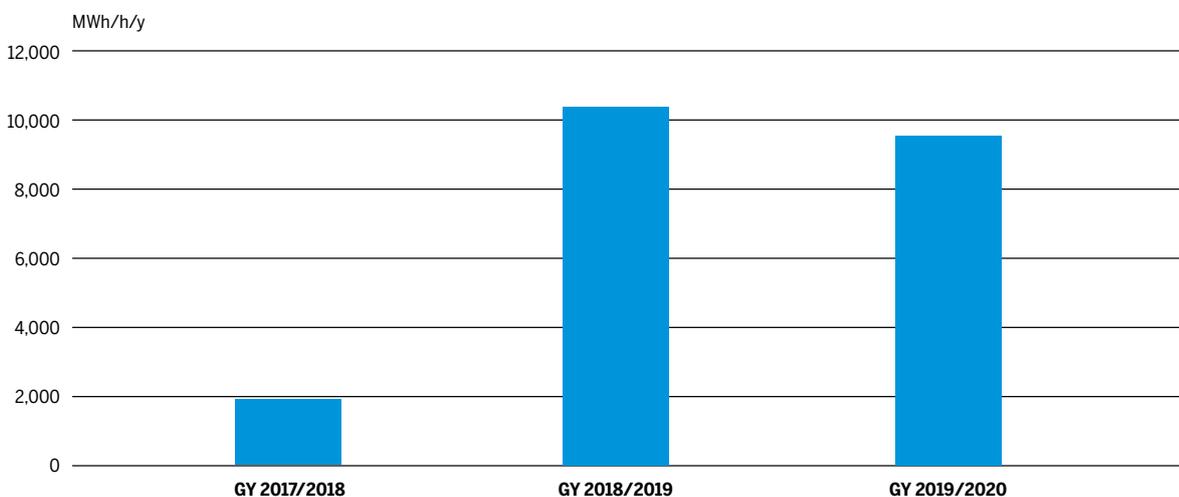


Figure 5: Bundled firm capacity traded on the secondary market

CAM.2.1: Ratio of bundled capacity allocated in the secondary market relative to the capacity allocated through auctions

Indicator CAM.2.1 compares the bundled firm capacity allocated on the secondary market in relation to the bundled firm capacity that is allocated in the primary market through auctions.

Gas year (in MWh/h/y)	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Bundled firm capacity allocated through auctions	41,888.00	2,572,547.00	215,581.00	252,891.91	248,323.45
Bundled firm capacity allocated on the secondary market	511.40	13,369.00	1,835.00	10,339.54	9,520.33
Ratio	1.22 %	0.52 %	0.85 %	4.09 %	3.83 %

Ratios for CAM.2.1 are very low, 4.09 % and 3.83 % for the GYs 2018/2019 and 2019/2020 respectively, which indicates that the total bundled firm capacity that is allocated on the secondary market is minimal

compared to the bundled firm capacity allocated through auctions. However, this ratio has increased in the last two GYs compared to previous years.

CAM.3: Increase of market participants in a system

ENTSOG uses the number of participants who are registered and active on the booking platforms to show the evolution of participants on the market throughout the years.

which suggests that the harmonisation of capacity allocation rules is providing more clarity and facilitating access for network users to different European markets. Nevertheless, it can be observed that the number of active participants has decreased from the GY 2017/2018 until the last year considered in this report.

The data collected shows an increasing trend over the years regarding the number of market participants

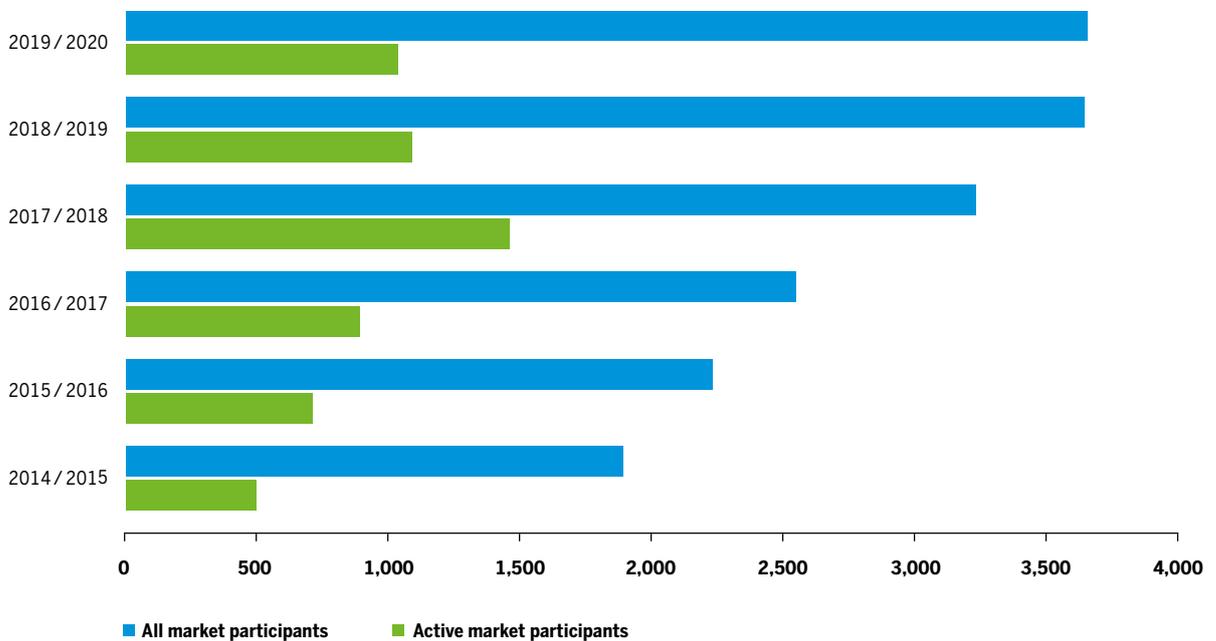


Figure 6: Market participants in a system



CMP GLS IMPLEMENTATION MONITORING

ENTSOG launched the 2020 implementation monitoring exercise for CMP GLs in November 2020. In the survey conducted by ENTSOG on the level of implementation of the CMP GLs, 44 TSOs out of 50 EU TSOs (44 ENTSOG members¹⁾, three associated partners and three other TSOs that are not ENTSOG members²⁾ have implemented Surrender of Capacity, Long-Term Use-It-Or-Lose-It (LT UIOLI) and oversubscription and buy-back (OS+BB) or Firm Day Ahead

Use It or Lose It (FDA UIOLI). Only one TSO was still in the process of implementing the CMP measures by the end of 2020, the decision of the NRA is still pending. The remaining five TSOs are either derogated or do not have any IPs.

Three TSOs use an implicit allocation method for capacity, which is in accordance with Article 2(5) of the CMP GLs.

CMP GLS EFFECT MONITORING

The collected data for effect monitoring corresponds to the GYs 2018/2019 and 2019/2020. To measure the effects of CMPs in the European market, ENTSOG and its members agreed on two indicators that show the impact of introducing congestion management mechanisms at Interconnection Points (IPs). Effect monitoring was performed only on the side of the IP labelled as “congested” by ACER in its two latest contractual congestion reports³⁾.

EFFECT MONITORING INDICATORS AND THEIR RESULTS

CMP.1: Additional capacity volumes made available through each CMP

Gas Year 2018/2019	OS+BB	FDA UIOLI	SURRENDER	LT UIOLI
Additional Capacity Offered (MWh/h/y)	91.64	3,966,270.82	7,385,499.40	-
(Re)allocated Capacity (MWh/h/y)	5.32	514,573.66	4,080,805.80	-
Ratio	6 %	13 %	55 %	-

1) Conexus is not considered as an ENTSOG member here as in the period covered by this monitoring exercise it was an associated partner.

2) The three TSOs that are not ENTSOG members are OPAL Gastransport GmbH & Co. KG, Fluxys Deutschland GmbH and Lubmin-Brandov Gastransport GmbH.

3) [6th](#) and [7th](#) ACER Reports on Contractual Congestion in the EU Gas Markets

Gas Year 2019/2020	OS+BB	FDA UIOLI	SURRENDER	LT UIOLI
Additional Capacity Offered (MWh/h/y)	30,635.64	11,082,458.11	23,536,263.98	-
(Re)allocated Capacity (MWh/h/y)	366.54	1,759,603.37	8,036,685.00	-
Ratio	1 %	16 %	34 %	-

As can be seen in the tables above, FDA UIOLI and Surrender of contracted capacity are the two CMP mechanisms that released the most capacity at congested IPs for the observed period, while the LT UIOLI mechanism and OS+BB did not provide any or very little additional capacity to the market. It can also be observed that Surrender of contracted capacity resulted in the highest ratio between offered and reallocated capacity.

CMP.2: Share of capacity reallocated through CMP among total capacity reallocated

The chosen indicator compares the allocation of additional capacity through CMP mechanisms with the allocation of the total additional capacity (additional capacity allocated from that offered through CMP mechanism plus additional capacity allocated from offered capacity in the secondary market).

$$CMP.2 = \frac{ACMP}{(ACMP + ASM)} \times 100 = 99.7\%$$

Figure 7: Results of CMP indicator 2 in MWh/h/y for GY 2018/2019

$$CMP.2 = \frac{ACMP}{(ACMP + ASM)} \times 100 = 99.8\%$$

Figure 8: Results of CMP indicator 2 in MWh/h/y for GY 2019/2020

Where:

CMP.2: Return ratio of additional capacity allocated through all CMP measures relative to the total allocation of additional capacity within a definite period of time.

ACMP: Sum of allocated additional capacity offered through all CMP measures within a definite period of time.

ASM: Sum of allocated capacity acquired from organized secondary markets within the same period.

Interpretation:

CMP.2 = 100: All reallocated capacity is supplied through CMP measures applied by TSOs.

CMP.2 < 100: This indicates that network users reallocate some capacity themselves using the secondary markets and not only through CMP measures applied by TSOs.

Compared to previous reports, the offering of additional capacity on the secondary market has declined. For both gas year 2018/2019 and 2019/2020 the amount of capacity that was reoffered on the secondary market was less than 1 percent of the total amount of reoffered capacity. For gas year 2018/2019, 40.5 % of the capacity being offered through CMPs at congested IPs was allocated and for gas year 2019/2020 the corresponding value was 28.3 %.

CONCLUSIONS OF THE CMP GLS EFFECT MONITORING

The current ways of offering additional capacity through existing CMP mechanisms allow network users to still access the market in situations where IPs are contractually congested.

The current situation in the European gas market shows that, of the total amount of additional capacity offered through CMP mechanisms, around 28 % to 41% is reallocated to the market. This indicates that the measures help in managing contractual congestion situations.

4

SYSTEM DEVELOPMENT SCENARIOS AND INFRASTRUCTURE



The System Development business area covers ENTSOG activities related to scenario development, investment planning and infrastructure assessment for the EU energy system. The main deliverables are short and medium to long-term assessments such as the Ten-Year Network Development Plan (TYNDP) and Supply Outlooks. In addition, the ENTSOG maps show commitment to transparency and to providing stakeholders with easily accessible and high added value information. All these deliverables aim at developing a vision of the integrated European energy market and in particular its infrastructure component. This vision is especially important in view of completing the pillars of the European Energy Policy to achieve the European energy and climate targets and commitments of the Paris Agreement and the EU Green Deal.

WORK STRUCTURE

The activities within the System Development Area are managed via the Scenario Working Group (SCN WG) and the Investment Working Group (INV WG) and supplemented by the Network Model Kernel Groups (NeMo KG).

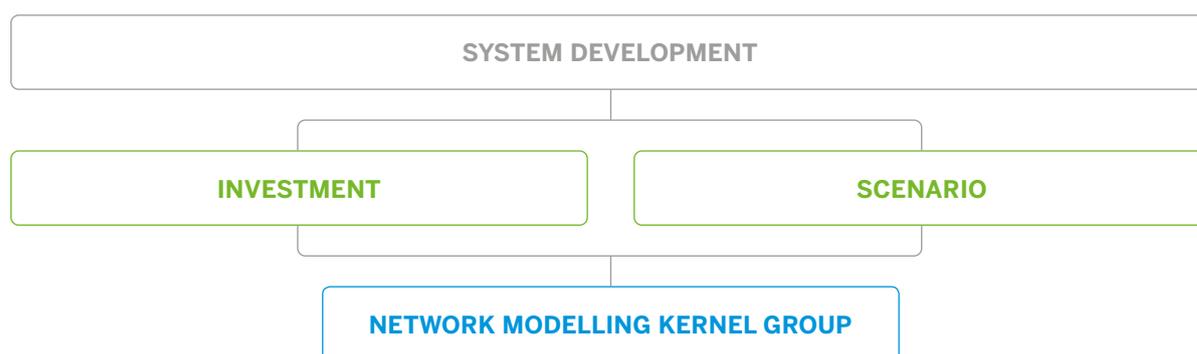


Figure 9: Investment and Scenarios Working Groups and associated KG

As shown in Figure 9, the Working Groups (WGs) are supported in their mission by the Network Modelling Kernel Group (NeMo KG), which was established to

develop and enhance ENTSOG's modelling tool and perform the simulations for ENTSOG deliverables in accordance with defined Scenarios for TYNDP.

INVESTMENT

The Investment Working Group (INV WG) is responsible for developing regulatory deliverables: The Union-wide Ten-Year Network Development Plan (TYNDP), the Winter and Summer Outlooks and the implementation of ENTSOG Cost-Benefit Analysis (CBA) Methodology, including the joint gas and electricity projects CBA methodology (as part of the Interlinked Model). It is also responsible for non-regulatory deliverables: Winter and Summer reviews, the Transmission

Capacity Map and the System Development Map developed in collaboration with Gas Infrastructure Europe (GIE).

The INV WG meet on a monthly basis (and adhoc, as required) and comprise participants representing Member TSOs across Europe.



Picture courtesy of GAZ-SYSTEM

SCENARIOS

The Scenarios Working Group (SCN WG) is responsible for developing the supply and demand scenarios for ENTSOG deliverables based on analysis of current situation and potential future trends. SCN WG has been supported by the ENTSOG and ENTSO-E joint Scenario Building Working Group, gathering experts from both electricity and gas TSOs, and tasked with

developing joint scenarios for the electricity and gas TYNDPs as the corner stone of their Interlinked Model between gas and electricity.

The SCN WG meets on a monthly basis (and adhoc, as required) and comprise participants representing Member TSOs across Europe.

ACTIVITIES

INVESTMENT AND SCENARIOS

The INV WG and SCN WG were involved in several activities in 2020. These are listed in the following sections.

UNION-WIDE TEN-YEAR NETWORK DEVELOPMENT PLAN 2020

In November 2020, ENTSOG published the Draft TYNDP 2020 for public consultation and ACER's Opinion.

Following the contribution received from stakeholders and taking on board the recommendations of ACER's Opinion, ENTSOG plans to finalise the TYNDP 2020 for publication in Spring 2021.

TYNDP looks at the next twenty years and assesses the European supply adequacy, and the resilience of the system. It identifies if and where investment gaps remain, and how submitted projects mitigate these gaps. Since TYNDP 2018, the commissioning of a number of projects has improved the resilience of the European gas system, however some infrastructure gaps remain in certain regions under certain scenarios.

TYNDP 2020 confirms that projects having already made their final investment decision (FID) and advanced projects to be commissioned in the next five years address efficiently most of the infrastructure needs to reach an effective level of cooperation between the different countries. However, a limited

number of countries could still face some infrastructure limitations in some scenarios and in certain years. The gas system also proves to be resilient to cope with extreme temperatures and supply disruptions, while supporting intermittent renewables. These features of the gas system are key to achieve the European climate and energy objectives by supporting decarbonisation and energy system integration as set out by the European Green Deal. ENTSOG is committed to the continual improvement of the TYNDP and has taken the feedback received from both ACER and the stakeholders and incorporated the elements that could be addressed in the final TYNDP publication. A feedback section is included, and the report includes annexes with information on the methodology, the projects, the TYNDP map, and the Gas Quality Outlook. Feedback will be taken into consideration for the future editions of the TYNDP.

For the first time, ENTSOG has included in its TYNDP the Energy Transition projects – projects which facilitates the integration of renewables, the achievement of decarbonisation and efficiency targets, reduction of other air pollutants, sector coupling initiatives and, more generally, all projects specifically aimed at the energy system transformation for reaching sustainability goals and not already included in the previous project categories. ETR projects represented approximately 28 % of all TYNDP 2020 collected projects.

SEASONAL SUPPLY OUTLOOKS AND REVIEWS

The objective of the Supply Outlooks is to assess the flexibility offered by gas infrastructures for each of the oncoming Summer and Winter seasons, by considering the latest supply and demand trends, which are shown in the correspondent Review reports.

Summer Supply Outlook reports focuses on the ability of the gas infrastructure to allow market participants to reach high storage levels at the end of the summer gas season, based on the actual storage levels at the beginning of the injection time horizon. The analysis is completed using sensitivities targeting different stock levels under different supply situations.

The Summer Supply Outlook 2020 report identified the European Gas network as sufficiently robust to enable enough stock level in preparation for the winter and flexibility for the supply strategy of the network users.

Winter Supply Outlook reports explores the evolution of the underground storage inventories across the winter gas season while ensuring the supply-and-demand balance during specific high-demand situations. The robustness of the report is complemented by a sensitivity analysis on the different climatic profiles of the winter. The resilience to potential transit disruptions through Ukraine was assessed.

The results of the Winter Supply Outlook 2020/2021 analysis indicate that the European gas system offers enough flexibility across the winter season in Europe, even in the case of high demand during an extremely cold winter. One of the report's key findings is that shippers could ensure flexibility by further injecting into storages to support an adequate storage level as of October of each year.

ENTSOG and ENTSO-E cooperated on their Winter Outlook reports, which allowed the ENTSO-E Winter Outlook to reflect the ability of the power system to cope with gas security-of-supply situations that may affect gas-fired generation.

Seasonal Reviews are an ENTSOG initiative based on the internal analysis of the supply-and- demand trends used to feed the TYNDP and Supply Outlooks. ENTSOG publishes these analyses to share the results with stakeholders.

These reviews establish the basis to define the input data and methodology of subsequent reports. In addition to the focus on the supply-and-demand balance, the reviews go further by analysing the trend of the gas demand for power generation as well as of providing an insight on gas prices and traded quantities at the main European hubs.

SYSTEM DEVELOPMENT MAP 2019/2020

The INV WG and the NeMo KG were involved in the work to publish the System Development Map 2019/2020.

ENTSOG publishes the System Development Map (in collaboration with GIE) on an annual basis, which focuses on supply and demand trends. The 2019/2020 edition was finalised in December 2020 and published in January 2021.

ENTSO-E/ENTSOG CONSISTENT AND INTERLINKED MODEL

In line with Regulation (EU) 347/2013, the ENTSGOs submitted the draft version of their consistent and interlinked electricity and gas network and market model (the Interlinked Model) to the Commission and ACER on 21 December 2016, and ACER issued its Opinion on 20 March 2017.

Starting with TYNDP 2018, the ENTSGOs have implemented the joint scenario building process, which covers the most substantial part of the draft Interlinked Model and will continue to do so in the subsequent TYNDP editions.

ENTSOG and ENTSO-E acknowledge that ACER's Opinion points out additional potential interlinkages. To meet ACER expectations, in September 2019 the "Investigation on the interlinkage between gas and electricity scenarios and infrastructure projects as-

assessment" Report (i. e., Focus Study), commissioned by ENTSO-E and ENTSOG and developed by Artelys, was published. The main objective of this focus study is to provide ENTSO-E and ENTSOG with the elements allowing them to determine on which kinds of projects a more thorough investigation of the impacts of inter-linkages should be performed.

In 2020, ENTSO-E and ENTSOG have started jointly working to develop and implement a project screening methodology, considering the outcomes of the Focus Study as well as to develop and test a dual assessment methodology for electricity, gas and hybrid projects for its application as a pilot project on the basis of TYNDP 2020 and as an extensive analysis for the TYNDP 2022 and beyond. The outcome of this investigation also provides input to the TYNDP scenarios development process (also part of the overall Interlinked Model).

THE ADAPTED COST-BENEFIT ANALYSIS (CBA) METHODOLOGY 2.0

The first CBA methodology was approved by Commission in 2015. It was applied to develop TYNDP 2015 and TYNDP 2017, and therefore supported the 2nd and 3rd PCI selection process.

Consequently, ENTSOG developed the adapted 2nd CBA methodology, in line with Article 11(6) of Regulation (EU) 347/2013. ENTSOG published the Adapted 2nd CBA 2.0 on 23 October 2018, which was approved by Commission on 17 January 2019. The Adapted CBA methodology 2.0 was implemented for the first time in TYNDP 2018.

ENTSOG is constantly working to improve its application for the next TYNDP editions (including TYNDP 2020). For TYNDP 2020, ENTSOG has implemented the adapted sustainability indicator developed by Trinomics/Artelys for the European Commission for the project-specific CBAs.

SUPPORT TO REGIONAL GROUPS FOR THE 5TH PCI SELECTION PROCESS

ENTSOG provided continued support to the Regional Groups in the 4th process of selecting projects of common interest (PCI).

The TYNDP 2020 plays an important role in the PCI selection process initiated by the European Commission.

ENTSOG has provided support to the 5th PCI selection process by closely cooperating with the European Commission in configuring and offering its technical platform – the ENTSOG Project Portal – to perform the call for PCI projects.

Additionally, upon formal invitation by the European Commission, and under the mandate of project promoters, ENTSOG managed and delivered the Project Fiches to PCI candidate projects' promoters. These present project-specific cost-benefit analysis (PS-CBAs) of PCI candidates, the results of which were published in January 2021. ENTSOG also provided technical support to all promoters in the submission of their projects to the European Commission and the Regional Groups.

The EC 5th PCI selection process commences at the end of 2020 and ENTSOG will support this process throughout 2021, by participating to the PCI Cooperation Platform activities and by providing its technical support to the Regional Groups.

SUPPORT TO GAS COORDINATION GROUP

The Gas Coordination Group (GCG) is a platform established by Regulation (EU) 944/2010, introducing measures of safeguarding the security of gas supply.

The role of the Gas Coordination Group (GCG) is to exchange information and best practices, and to facilitate Security of Supply (SoS) standards and to support supply-and-demand balance, especially in case of critical situations. Members include the European Commission, representatives of EU Member States, ENTSOG, and other international organisations as well as the industry.

In 2020, ENTSOG was asked to work on the addendum to the Union-wide simulation of gas supply and infrastructure disruption scenarios (SoS simulation report) published in October 2017. Since report publication, many major infrastructures have been commissioned across Europe to the benefit of security of gas supply. After the request from GCG members, the scope of re-simulation was defined. Based on assumptions agreed by GCG, ENTSOG performed a data collection in May 2020 – the same data used in the Winter Supply Outlook 2020/2021 – and performed the simulations over the summer 2020.

This study considered three disruption scenarios as defined in the 2017 SoS Simulations, based on the major infrastructure investments commissioned in 2019 – Balticconnector between Finland and Estonia and a new import capacity from Russia via Turkey to Bulgaria. The results of the simulations were approved by GCG in October 2020.

ENTSO-E/ENTSOG JOINT TYNDP SCENARIO REPORT

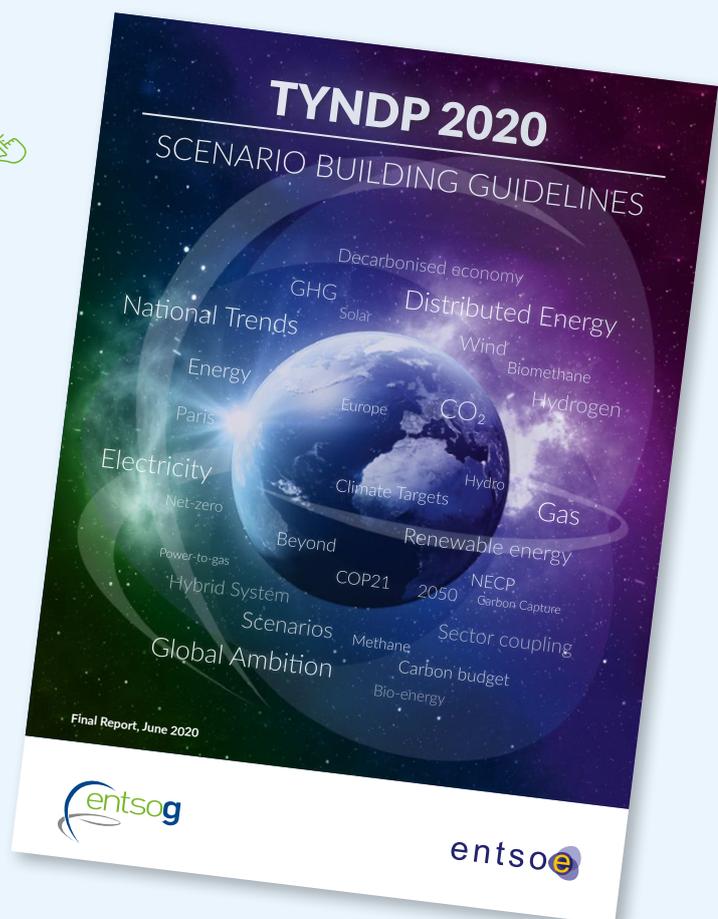
Since development of the TYNDP 2018, and to deliver the consistent and interlinked model, ENTSOG and ENTSO-E have joined their scenario building workstreams, building on their combined expertise and modelling capabilities as well as on the input received from dozens of stakeholders from the industry, NGOs, National Regulatory Authorities and Member States. This co-development approach results in a set of ambitious, technically robust and equally realistic scenarios. The joint scenarios outline the quantification of three markedly different storylines, possible paths towards a low-carbon energy system in line with EU targets.

ENTSOE and ENTSOG published their draft TYNDP 2020 Scenario Report in November 2019, followed by public consultation from 21 November 2019 to 17 January 2020, which included a public Stakeholder Workshop on 5 December. The ENTSGs updated their scenarios, considering the consultation feedback. The final TYNDP 2020 Scenario Report was published in June 2020.

To further improve their joint scenarios for their TYNDPs 2020, ENTSOG and ENTSO-E have developed two COP 21 full energy scenarios (Distributed Energy and Global Ambition) in addition to a scenario (National Trends) based on the National Energy and Climate Plans (NECPs). National Trends captures each Member State's strategy to comply with the EU 2030 climate targets, whereas the full energy scenarios (Distributed Energy and Global Ambition) will ensure an in-depth assessment of sectoral interlinkages, fuel switches and the monitoring of all GHG emissions in line with the 1,5°C target of the Paris Agreement. For this, the ENTSGs have collaborated with external stakeholders such as Climate Action Network (CAN) Europe and Renewables Grid Initiative (RGI) to quantify a carbon budget for the EU28 following the statements of latest Special Report¹⁾ of the Intergovernmental Panel on Climate Change. This recommends a thorough assessment of the whole energy supply chain, sectoral interlinkages and the development of renewable and decarbonised gases.

Find the complete report on our
TYNDP-Scenarios-website:

2020.entsos-tyndp-scenarios.eu



1) [IPCC Special Report 15](#)

5

SYSTEM OPERATION: SECURITY OF SUPPLY, REMIT, TRANSPARENCY AND INTEROPERABILITY



The primary work of the System Operations business area includes developing and monitoring technical Network Codes, evaluating activities related to gas quality standardisation, developing and maintaining existent Common Network Operation Tools (CNOT), the ReCo System for Gas, and the maintenance and continuous development of ENTSOG's Transparency Platform (TP), including activities referring to REMIT. In 2020, System Operations comprises two main working groups: Interoperability (INT WG) and Transparency (TRA WG).

WORK STRUCTURE

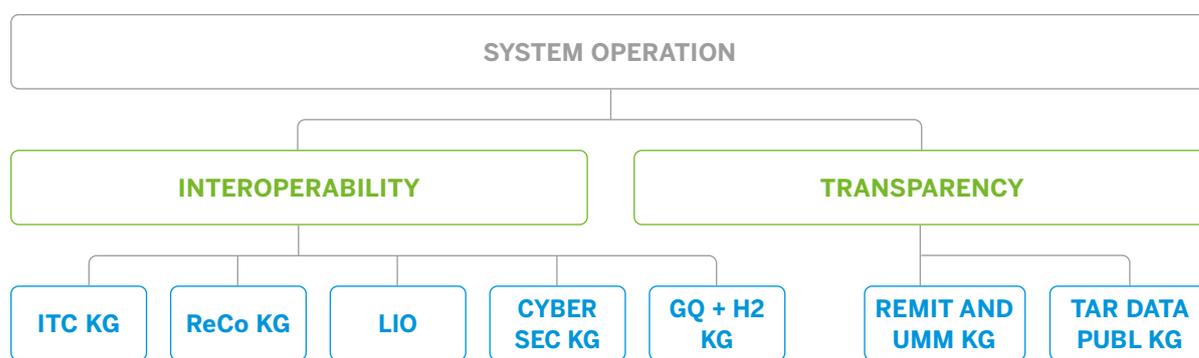


Figure 10: Interoperability and Transparency Working Group and associated KGs

TRANSPARENCY

The Transparency Working Group (TRA WG), which ensures compliance with the transparency requirements, is supported by the REMIT Kernel Group (KG), following the activities in ACER's RRM User Group, ACER's REMIT Expert Group, ACER Roundtable for inside information disclosure, ACER AEMP Roundtable and general REMIT developments.

The TRA WG meet monthly and the REMIT KG biweekly (and adhoc, as required) and comprise participants representing Member TSOs across EU Member States.

INTEROPERABILITY

The Interoperability Working Group (INT WG) monitors the implementation of the INT & DE NC and oversees the work of the groups mentioned below.

ENTSOG members' work on interoperability topics is structured around the following groups within the System Operations area:

- ▲ The Regional Coordination System for Gas KG includes the three ReCo Teams: North-West, East and South and focuses on operational cooperation for security of supply.

- ▲ The Information Technologies and Communications KG develops and maintains the ENTSOG Common Network Operation Tools for normal conditions, as stated in the INT & DE NC Art 24, including Business Requirement Specifications, Implementation Guidelines and communication profiles. Furthermore, the ITC KG is assessing cooperation with other European organisations (e.g., CEF, EASEE-gas), on new developments and investigating their applicability for use within the ENTSOG AS4 profile.

- ▲ The Cybersecurity task force is jointly managed by GIE and ENTSOG.
- ▲ The Gas Quality and Hydrogen KG coordinates the cooperation with CEN, Marcogaz, EASEE-gas, and GIE as well as preparing the TYNDP Gas Quality Outlook reports. In addition, the ENTSOG team and members contributed with inputs and expertise to the prime movers' group in gas quality and hydrogen (GQ & H₂) handling, as well as, the development of recommendations to facilitate the setting of basic rules and procedures needed for the implementation of a Wobbe-Index classification system based on the proposal developed by CEN SFGas 'Prenormative Studies of H-Gas quality parameters' (CEN SFGas GQS).
- ▲ ENTSOG and Local Issuing Offices from the gas sector established on a voluntary basis a dedicated expert group to coordinate their activities and exchange experiences in managing energy identification codes (EIC) and communication to the Central Issuing Office (managed by ENTSO-E). The group provided suggestions for amending some EIC functions and definitions as discussed with ENTSO-E. Further activities are envisaged for 2021.

These groups meet on a monthly basis (and adhoc, as required) and comprise participants representing Member TSOs across Europe.

ACTIVITIES

ENTSOG TRANSPARENCY PLATFORM (TP)

ENTSOG's Transparency Platform (TP) provides technical and commercial data on the gas transmission systems, which includes relevant points, such as interconnection points and storage connections, LNG facilities, distribution networks, final consumers and production facilities depending on the NRA decision. The current version of ENTSOG TP was launched on 1 October 2014. It was developed with the aim of improving transparency, user friendliness and data publication capabilities. It is a powerful tool providing the means for ENTSOG's Members, Associated Partners and Observers to fulfil their data publication obligations¹⁾. ENTSOG received strong support from many stakeholders with regards to TP functionality and the information provided therein.

The Transparency Platform is available at this link: <https://transparency.entsog.eu/>

- ▲ Facilitation of UMM section through the direct URLs for UMM "Unavailabilities of Gas Facilities" and "Other Market Information" sections and individual UMMs.
- ▲ New feature "Personalised login", enabling a more efficient use of the TP GUI.
- ▲ Update of Video section with new video "How to use API calls instead of Favourites".
- ▲ Improvement of Help section with TP Archive and TP Announcement section.
- ▲ Implementation of a solution called "Interruption calculation indicator" to specify how interruption of firm and interruptible capacity is calculated.
- ▲ Improved Tariff data section with updated default tariff visualisation.

RELEASED FUNCTIONALITIES AND IMPROVEMENTS

Improvements during 2020 included:

- ▲ Update of the TP documentation with new sections on data publication descriptions for Transport Data and Inside Information.
- ▲ Improved Export Wizard section by adding download per "Point type".
- ▲ Improved Export Wizard section by including Booking platform info in Transport data.
- ▲ Direct link to individual messages.
- ▲ Facilitation of UMM section through the direct URLs for UMM sections and individual UMMs.

Updated UMM section and RSS

Since 1 October 2014, a solution for publishing Urgent Market Messages (UMMs) on the ENTSOG TP has existed. In 2020, ENTSOG has implemented several additional features for increased user friendliness and still meets the ACER recommendation and technical requirements to the Inside Information Platforms (IIPs):

1) see Chapter 3, Annex I, Regulation (EU) No 715/2009. Additional obligations for transparency publications are laid out in the Tariff, Capacity Allocation Management, and Interoperability Network Codes



Publications of inside information via UMMs is open to ENTSOG Members, Associated Partners, Observers, Booking Platforms, Market Area Managers. For these users, there is a SharePoint form that can be used to create new (versions) of the UMMs as well as an XML solution to transmit the information to the ENTSOG TP automatically.

In 2020, ENTSOG Transparency Platform successfully completed the first phase of application to be listed as an IIP in line with ACER commencement of the process of registering Inside IIPs based on their compliance with the minimum quality requirements for effective disclosure of inside information, as defined in Section 7.2.2 of the ACER Guidance¹⁾.

TP User support

ENTSOG organised the 14th Annual Public Transparency Workshop online on 19 November 2020. The workshop was organised in two sessions dedicated to the following topics:

1st Session: Transparency and Transparency Platform

- ▲ ENTSOG Transparency Platform: Functionality updates during 2020, feedback collected from users and ideas for the future improvements.
- ▲ Market Development: Changes to Transparency Publications due to the German market merger 2021.
- ▲ Avoiding data duplication: Case description of preventing simultaneous data publications on TP and TSO website.

- ▲ Updates on transparency publications for Contracting Parties and new interconnection agreement publications.

2nd Session: REMIT

- ▲ Lessons learned after five years of data collection and REMIT Table 4.
- ▲ Upcoming challenges for REMIT.

Interactive breakout-sessions facilitated by ENTSOG Staff and Members on several topics including:

- ▲ The Gas Network Codes.
- ▲ The latest news on Data Exchange and Edigas formats.
- ▲ The latest news on ENTSOG Hydrogen and Gas Quality initiatives.
- ▲ Guarantees of Origin.
- ▲ The ENTSOG 2050 Roadmap Action Plan.

All presentations and summary notes are available on **ENTSOG's website** .

In addition to the public workshop, TP user requests are addressed continuously. Besides the development of the "Personalised login" aimed at replacing the old favourites feature, and videos developed to support the users working with the TP, the TP User questions have been answered with expertise and support of ENTSOG and TSOs. About 500 questions were answered in 2020.

1) <https://www.acer-remit.eu/portal/list-inside-platforms>



TP USAGE, STAKEHOLDER INVOLVEMENT AND DATA PUBLICATION

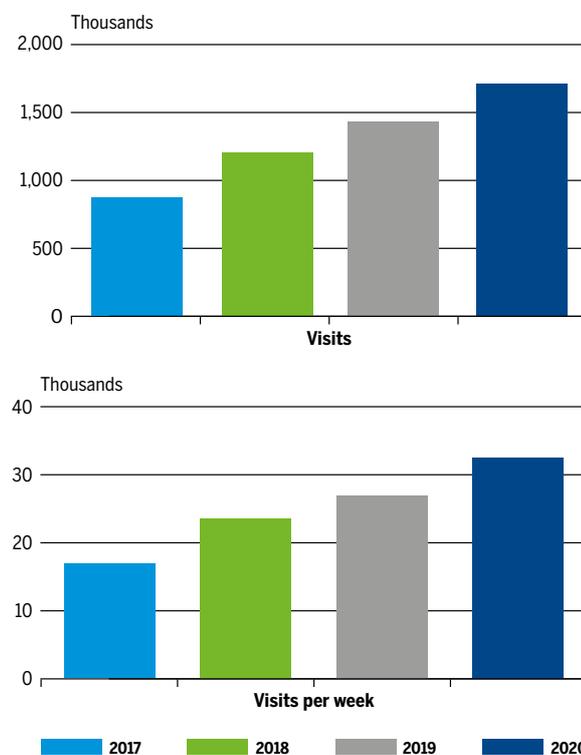
ENTSOG and TSOs work closely together to achieve the highest quality and comprehensiveness of the data published on the platform. To satisfy and serve the market expectations of data quality and transparency, an internal monitoring process is established to facilitate the joint efforts of ENTSOG and its Members. This process is continuously evaluated and updated, to keep up with the constant changes in functionalities and reporting requirements.

Besides TSO publications, ENTSOG is also supplying the European Commission and ACER with customised reports for specific tasks. In 2020, this entailed extensive work on reports to ACER in relation to their monitoring obligations for application of CMP measures, i. e., the Congestion Report, and the Market Monitoring Report. A new workstream was also added, to share information on Long-Term Capacities with ACER. ENTSOG TSOs and ACER worked together on creating the data collection, and the data was delivered successfully to ACER in May 2020.

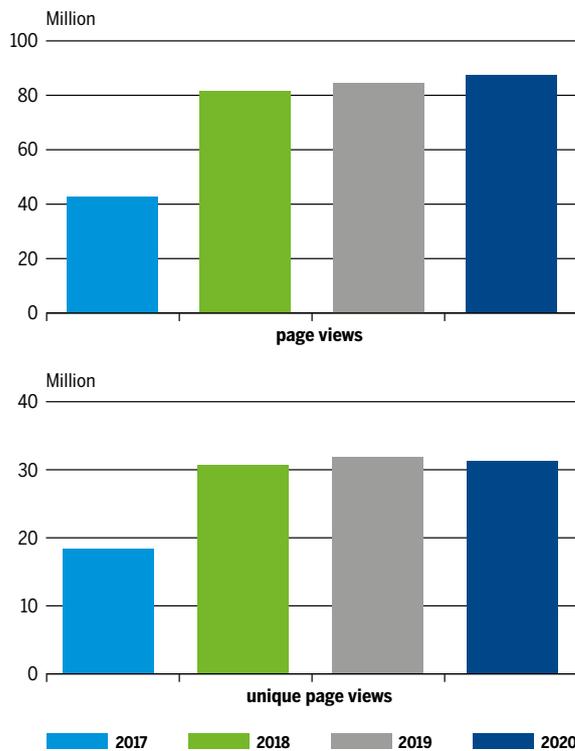
In 2020, ENTSOG shortened the existing TP Satisfaction Survey, which is aimed at getting a better understanding of the general TP user satisfaction and providing an additional forum for receiving TP user input.

TP Usage statistics

Usage statistics 2020 are included below:



The number of visits has increased by 19 % to a total of 1,704,203 in 2020 compared to 2019 and an increase of 21 % towards 32,773 for the average amount of visits per week. The highest number of visits was reached on 4 November 2020 with 6,659 visits on that day, of which 6,505 were unique visits.



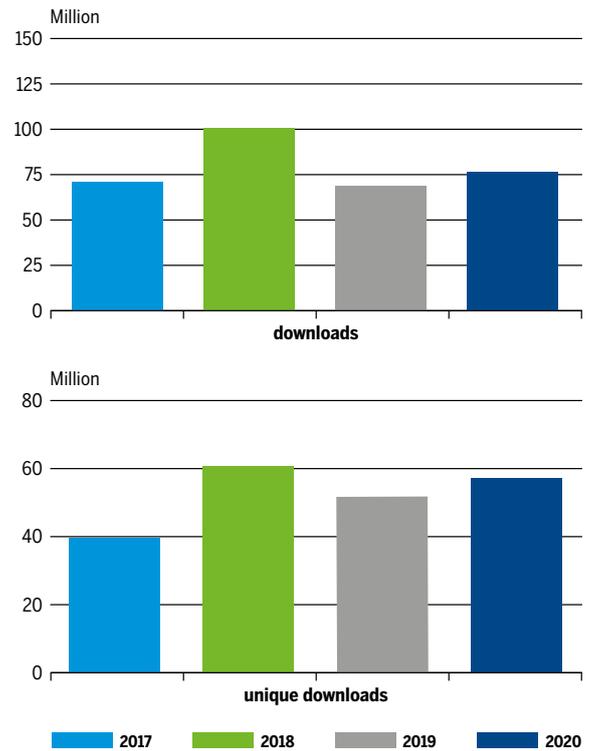
Compared to 2019, the number of page views has seen a slight increase of 4 % to a total of 87,493,879 in 2020 and the same decreased towards 31,213,422 for the total number of unique page views in 2020. It should be noted that API calls for fetching data to the TP are also counted as page views.

REMIT ACTIVITIES

Regulation (EU) No 1227/2011 Regulation on Energy Market Integrity and Transparency (REMIT) establishes rules prohibiting abusive practices affecting wholesale energy markets and providing more transparency regarding price-relevant (inside) information. It provides for the monitoring of wholesale energy markets by the ACER in close collaboration with NRAs. The goal of REMIT, through strong cross-border market monitoring, is to detect and avoid market manipulations and to facilitate the completion of a fully functioning, interconnected and integrated internal energy market.

Commission Implementing Regulation (EU) No 1348/2014 stipulates the information that shall be

The number of downloads has increased with 7 % compared to 2019, to a total of 75,674,784 in 2020 and an increase of 9 % towards 57,207,389 for the total number of unique downloads in 2020.



In 2020, users of TP were retrieving data from the TP through 725,889 dedicated API calls. This comes on top of the downloads and front-end queries on the TP. Keeping a stable user environment is important when managing the API calls and several users have been blocked during the year to fulfil this goal.

reported and defines the rules to be followed by the market participants with regards to their REMIT reporting to ACER.

ENTSOG'S ACTIVITIES AS RRM

Since 2015, ENTSOG has been a Registered Reporting Mechanism (RRM). On behalf of gas TSOs, ENTSOG reports aggregated fundamental data to ACER with regards to the capacity and use of facilities for the transmission of natural gas, including planned and unplanned unavailability of these facilities¹⁾.

1) as defined in Article 9 (1) of Commission Implementing Regulation (EU) No 1348/2014

The ENTSOG reporting system was developed according to the provisions of Commission Implementing Regulation (EU) No 1348/2014 and other supportive documentation issued by ACER with regards to REMIT. Since 7 October 2015, ENTSOG has been reporting the following set of aggregated fundamental data to ACER, for each TSO that is publishing data on the ENTSOG Transparency Platform:

- ▲ Aggregated day-ahead nominations
- ▲ Aggregated final re-nominations
- ▲ Actual physical flow
- ▲ Technical capacity
- ▲ Available firm capacity
- ▲ Contracted firm capacity
- ▲ Total interruptible capacity
- ▲ Available interruptible capacity
- ▲ Contracted interruptible capacity
- ▲ Planned interruption of interruptible capacity
- ▲ Actual interruption of interruptible capacity
- ▲ Planned interruption to firm capacity
- ▲ Unplanned interruption to firm capacity

ENTSOG submits the required information to ACER as it was received on the Transparency Platform, to ACER's REMIT Information System (ARIS).

As to the data reporting performed by ENTSOG on behalf of gas TSOs, ENTSOG provides the following information to its members:

- ▲ Segregated access (per TSO) to report files submitted to ACER Reporting Information System for Applying REMIT (ARIS)
- ▲ Segregated access (per TSO) to return receipts received by ENTSOG Reporting system from ARIS
- ▲ Daily report (per TSO) on the status of files reported to ACER

As part of the REMIT Reporting process, ENTSOG is responsible for the following:

- ▲ Submitting ENTSOG TP data to ARIS
- ▲ Rectifying and (re)submitting data in case of technical reporting issues between ENTSOG and ARIS.

In the light of the above-mentioned tasks of ENTSOG the TSOs are responsible for carrying out the following:

- ▲ Performing complete, high-quality and timely data publications on ENTSOG Transparency Platform
- ▲ Monitoring information provided by ENTSOG on data reported on TSOs' behalf to ARIS
- ▲ If ACER rejects TSO REMIT data due to content/functional reasons, the respective TSO shall re-send the relevant information to the ENTSOG Transparency Platform. It will then be transmitted to ACER through the ENTSOG Reporting System

Since October 2020, ENTSOG has been in contingency plan mode, as the receipts from ARIS cannot be decrypted. ENTSOG is dependent on information from ARIS CSD to rectify the decryption configuration.

TSOs' IMPLEMENTATION OF REMIT REPORTING

Commission Implementing Regulation (EU) No 1348/2014 stipulates that gas TSOs shall report the following disaggregated information per market participant to ACER:

- ▲ Transaction data: natural gas transportation contracts within the Union between two or more locations or bidding zones, concluded as a result of a primary explicit capacity allocation by or on behalf of the TSO, specifying physical or financial capacity rights or obligations.
- ▲ Fundamental data: day-ahead nominations, final re-nominations of booked capacities, specifying the identity of the market participants involved, and the allocated quantities.

The TSOs reporting obligations under REMIT commenced on 7 April 2016.

To facilitate the TSOs' continued activities under REMIT, ENTSOG undertakes the following:

- ▲ Regular REMIT discussions at Transparency Working Group meetings
- ▲ Ad-hoc discussion sessions between ENTSOG's Transparency Team, TSOs and members of

ACER's REMIT Team. The aim is to provide clarity on various technical and policy questions and resolve issues related to data reporting. During 2020, ENTSOG Transparency Team and Transparency Working Group participated in the following events:

- ▲ ACER REMIT Expert Group meetings
- ▲ ACER RRM User Group meetings
- ▲ ACER ENTSOG TSOs' ad-hoc stakeholder webinars
- ▲ ACER Roundtables on inside information disclosure and REMIT reporting for AEMPs, IIPs and OMPs
- ▲ EC Roundtables on REMIT fees
- ▲ 4th Energy Market Integrity and Transparency Forum

The introduction of REMIT Fees has been a high priority topic for ENTSOG and the TSOs in 2020, trying to advocate that TSOs play a special and crucial role in facilitation of REMIT reporting and surveillance of Market Participants' behaviour in the wholesale energy market, as they alleviate the reporting burden for the Market Participants. Such special considerations were unfortunately not reflected in the REMIT Fees' methodology, published by the EC on 17 December 2020.

SECURITY OF SUPPLY

SECURITY OF SUPPLY (SOS) AND REGIONAL COOPERATION

Regional Coordination System for Gas (ReCo System)

The European gas market is continuously developing, and operation of the networks is becoming more complex. Therefore, it is beneficial for each TSO to operate efficiently and to ensure security of supply.

In 2017, Regulation (EU) 2017/1938 concerning measures to safeguard the security of gas supply came into force. It states that the regional cooperation should gradually be complemented with a stronger European perspective, allowing recourse to all available supplies and tools in the entire internal gas market.

Regional cooperation and coordination between TSOs play an important and significant role in security of gas supply, handling emergencies, and helping to minimise negative effects.

To address the above-mentioned objectives, the European Union's TSOs, under the umbrella of

ENTSOG, have established specific groups – ReCo Teams. Each ReCo Team is a community of TSOs for one of the supply corridors, which are explained in Reg. (EU) 2017/1938: "Union gas supply routes that help Member States to better mitigate the effects of potential disruption of supply or infrastructure". These include TSOs from the relevant gas supply risk groups defined in Annex 1 of Regulation 2017/1938 as well as other EU TSOs if reasonable. Non-EU TSOs can also be invited by ENTSOG (after approval by ENTSOG's Board) to become a member of a ReCo Team.

ReCo Teams can provide operational expertise on an ad-hoc basis to the concerned TSOs in case of a crisis or need to provide relevant information via ENTSOG to other stakeholders such as the Gas Coordination Group (GCG), the European Commission, and the Member States.

The Regional Coordination System for Gas has been functioning and progressing since 2014 with more and more TSOs coming on board. In 2021, all 45 ENTSOG members, 2 Associated Partners, and 4 TSOs from non-EU countries (51 in total) are participating in at least one of the three ReCo Teams (East, North-West, South).

Since March 2020, the COVID-19 pandemic had a significant impact on the normal way of working for most EU TSOs and especially on people involved in daily system operations. Therefore, ENTSOG and EU TSOs were systematically assessing the situation and risks related to the pandemic, such as the impact on system operations, work of dispatching teams and security of gas supply. TSOs also observed some gas demand changes at the beginning of the pandemic, but there was no impact on the operation of the EU gas system, supply or demand conditions, or extra activities for control centres.

All EU TSOs established measures to ensure business continuity and operation twenty-four hours a day, seven days a week (24/7). Examples of such measures include redundant dispatching centres, specific shift organisation including the possibility to activate main-tenance 24/7 in case of need, and strict instructions for dispatching and office crews. TSOs' main preventive measures were documented to be used by TSOs to minimise COVID-19 risk of spread and its impact on business continuity. As a result of TSOs measures, well preparedness and procedures TSOs ensured reliable safe and secure gas supply to their customers. Preventive action documentation was provided and discussed with the members of the GCG.

In line with the procedures of the ReCo System for Gas, TSOs successfully carried out unannounced communication exercises for all ReCo Teams.

ENTSOG also worked on the concept of an information platform to support TSOs in normal and emergency conditions, and in particular, for the exchange of operational data on the European level. Further developments of the concept will continue in 2021.

Support to the EC in terms of SoS

The ENTSOG team continued cooperating closely with the EC and participated in the scheduled GCG (Gas Coordination Group) meetings in 2020. These focussed on providing operational and system-development expertise during the pandemic, e. g., by sharing TSOs measures to prevent any negative impact of the pandemic on business continuity (in particular work of dispatching centres) and organisation procedures. In November 2014, the European Commission established the Ukrainian Monitoring Mission in cooperation with ENTSOG and the Ukrainian TSO Ukrtransgaz – as from 1 January 2020 now known as LLC Gas TSO of Ukraine. Within this framework, ENTSOG carried out monitoring of the daily nominations with the associated physical flows, the pressure at cross-border points between Ukraine and Russia, and the gas consumption and storage use within the Ukrainian gas market. Although Ukrainian and Russian parties agreed on gas transportation via Ukraine for 2021–2024, ENTSOG continued its monitoring mission in 2020 and was receiving relevant information about gas flows via Ukraine on daily basis.

ENTSOG and the TSOs provided identified risks and mitigation measures resulting from the COVID-19 pandemic and other threats to Trinomics. The information was used for a study for European Commission's DG ENER to analyse the resilience of the supply chains of critical energy infrastructure.



Recommendations relating to technical cooperation with 3rd countries.

In 2018, ENTSOG adopted "Recommendations relating to the coordination of technical cooperation between Community and third-country transmission system operators" ("Third-country TSOs")¹⁾.

The document describes the key areas of technical cooperation: Security of Supply and the ReCo System, Expert Knowledge on Interoperability, and the External Contact Platform. Furthermore, the criteria to categorise third-country TSOs have been developed and the corresponding groups identified: Energy Community and EFTA countries, countries with specific agreements to accommodate or implement EU legislation, and others. For each category, different recommendations for the key areas of cooperation are given.

ENTSOG and TSOs followed the provisions of the document. Together with the Energy Community Secretariat, two meetings with third-country TSOs were held within the framework of the External Contact Platform to exchange expert knowledge and deepen further cooperation.

ENTSOG also invited TSOs from non-EU countries to participate in several workshops and conferences on the relevant processes and developments in the EU gas transmission sector.

Non-EU TSOs (from the ReCo Teams) also took part in weekly and monthly calls with EU TSOs to monitor the situation and relevant risks related to the COVID-19 pandemic, exchange of knowledge and measures to prevent negative impact of the pandemic and ensuring business continuity.

1) in accordance with Article 8.3(c) Regulation (EC) No 715/2009

Picture courtesy of GASCADE





Picture courtesy of Gasgrid Finland

INTEROPERABILITY AND DATA EXCHANGE

INTEROPERABILITY AND DATA EXCHANGE NETWORK CODE

In 2020, ENTSOG undertook an assessment of the INT & DE NC implementation status by TSOs by the end 2019. 41 TSOs provided ENTSOG with an updated set of information (as a questionnaire) on Interconnection Points (IPs) and their Interconnection Agreements (IAs) compliance with the INT & DE NC, which has allowed ENTSOG to fulfil its monitoring and reporting obligations for 2019. This third monitoring report outlines the implementation of the requirements – as set out in Articles of the INT & DE NC – by TSOs on both sides of interconnection points (IPs) within the European Union.

Analysis of TSOs' replies and IAs' review indicate that, during the last two years, the adjacent TSOs have done significant work on improving IAs and documenting their mutual agreements on the main terms and conditions envisaged in the INT & DE NC. Default terms and conditions set out in the INT & DE NC are widely used. No cross-border trade barriers related to gas quality or odourisation were identified. Implementation progress can be seen in the areas of gas quality data publication and implementation of common data exchange solutions. The report is based on the analysis of detailed evidence of IAs' compliance with the INT & DE NC.

The results of this monitoring are provided in Section Interoperability & Data Exchange Network Code Implementation and Effect Monitoring.

UPDATES OF CNOTs

In 2020, ENTSOG continued to improve the common network operation tools (CNOTs), with special attention to the communication profiles. Under the data exchange section of its website, ENTSOG published or updated the following documents:

- ▲ The ENTSOG AS4 usage profile: Based on stakeholder feedback, ENTSOG proposed some changes for the AS4 usage profile. Together with Edig@s version 6, ENTSOG presented the changes at a joint public workshop with EASEE-gas on 1 December 2020. The AS4 usage profile provides not only interoperability guidance for the required AS4 functionality (i. e., whose requirements are mandatory or optional) but also security guidance based on state-of-the-art best practices following ENISA recommendations and best practices implemented by eDelivery.

- ENTSOG worked on two CNOT documents in 2020: BRS for CAM and CMP¹⁾ and BRS for nomination and matching procedures²⁾ adding additional parameters to indicate the changes coming from the new Edig@s version 6. The amended version of both documents is planned to be published in the second half of 2021.

FOLLOW-UP OF EASEE-GAS DEVELOPMENTS

ENTSOG cooperates closely with EASEE-gas in the field of data exchange as an observer in the relevant groups – Message Workflow and Design Working Group and Technology Standards Working Group – and this continued in 2020.

On the basis of the collaborative work undertaken in 2020, and as described in the previous section, ENTSOG and EASEE-gas will organise another joint workshop on data exchange in 2021.

FUNCTIONALITY ISSUES AROUND DATA EXCHANGE

The common data exchange solution for the recent data exchange FUNC issue was published on the FUNC platform in December 2020³⁾. Communication between Capacity Platform Responsible and Registered Network User is proposed to be 'document based' while 'interactive' is mentioned as the optional solution which can be provided on top (additional solution). The communication 'Aggregated Auction

Results' is proposed to be separated into communication to registered Network Users, where 'document-based' is the common data exchange solution while the communication to all other parties but Registered Network Users will remain as 'interactive'.

The three processes 'Surrender Capacity Rights', 'Reverse Auction Bid' and 'Allocate Reverse Auction Results' are proposed to remain as 'interactive' due to the fact that they were identified as processes with less than ten active parties and less than ten interactions per year.

Furthermore, ENTSOG is working on the solution for FUNC issue 'BRS for Balancing' which is connected to the data exchange part of the INT & DE NC.

OPERATION OF THE LOCAL ISSUING OFFICE (LIO)

Energy Identification Codes (EIC), standardised and maintained by ENTSO-E, provides a unique identification of the market participants and other entities active within the Internal European Energy Market. They are widely used in the Electronic Document Interchange and to identify parties and objects for REMIT. ENTSOG continued to operate the Local Issuing Office (LIO) throughout 2020 and now manages more than 1200 EIC codes for market participants across Europe. In 2020, ENTSOG continued cooperating with ENTSO-E via the joint Central Issuing Office (CIO)/LIO meetings and contributed to upgrading the EIC Reference Manual and addressing existing issues.

1) https://www.entsog.eu/sites/default/files/2019-03/CAP0554_170523_brs_cam%2Bcmp_v21_final.pdf

2) https://www.entsog.eu/sites/default/files/2018-10/BAL0453_160622_BRS%20on%20nominations_V17_0.pdf

3) <https://www.gasncfunc.eu/gas-func/issues/01/2019/view>

ENTSO-G and Local Issuing Offices from the gas sector established, on a voluntary basis, a dedicated expert group to coordinate their activities and exchange experiences in managing EIC and communication to the CIO, which is managed by ENTSO-E.

ANNUAL PUBLIC WORKSHOP ON DATA EXCHANGE

ENTSO-G organised an online Annual Public Workshop on 01 December 2020. It was the 3rd joint workshop with EASEE-gas since the main topics, i.e., AS4 as protocol and Edig@s as a format, are part of the document-based data exchange solution. The workshop included three sessions on the following topics:

- ▲ Recent developments of AS4
- ▲ Presentation from ENTSO-G, CEF and market participants on this topic

- ▲ Presentation of EASEE-gas on the project “EASEE-Connect”, an online platform facilitating the cooperation between market participants.
- ▲ Latest updates on the format Edig@s
- ▲ Presentation from EASEE-gas on the latest status of Edig@s 6
- ▲ Update on the FUNC issue “Missing harmonisation on capacity booking platforms”
- ▲ Joint ACER and ENTSO-G presentation about the status and planned next steps.

All presentations and summary notes are available on ENTSO-G’s website .

The workshop included an interactive part where the workshop participants were asked for their opinion on the presented topics. The workshop was attended by 100 participants, which is the highest in this workshop series since its launch and demonstrates the importance of this forum for the data exchange-related topics for the European gas market.

GAS QUALITY AND HYDROGEN

COOPERATION WITH CEN AND MARCOGAZ AND EASEE-GAS

During 2020, ENTSO-G continued cooperating actively with CEN, Marcogaz and EASEE-gas on the topics of gas quality and renewable, low-carbon and decarbonised gases. As part of the pre-normative research carried out within the CEN Sector Forum Gas – Gas Quality Study WG, ENTSO-G contributed to the proposal of a Wobbe Index (WI) entry range recommendation a requirement for a classification system at exit points. This was accepted by most gas value chain stakeholders and is envisaged to be included in the future for the revision of European H-gas standard (EN16726). This work will result in a final report for, among others, CEN TC234/WG11 in the first half of 2021. CEN TC234/WG11 is responsible for revising the H-gas standard. Throughout 2021, ENTSO-G will continue cooperating with CEN on revising and completing the EN16726 (H-gas quality standard) including renewable, low-carbon and decarbonised gases, as well as facilitating the discussion on the processes and requirements needed for the implementation of the WI classification system at exit points of the network, as part of the prime movers’ group on gas quality and hydrogen handling launched in Q3 2020.

ENTSO-G is also monitoring standardisation activities regarding the injection of hydrogen into the gas grid through the CEN Sector Forum Energy Management Working Group Hydrogen.

ENTSO-G is a member of the Marcogaz Working Group Gas Quality and Renewable Gases and Hydrogen TF. ENTSO-G is also a member of the EASEE-Gas Gas Quality Harmonisation Working Group which is currently drafting a Common Business Practice for the compositional requirements of hydrogen in Natural Gas infrastructure.

HYDROGEN IN THE TRANSMISSION SYSTEM

In 2020, ENTSO-G increasingly focused on assessing the possibilities to inject hydrogen into the transmission system via internal assessments among ENTSO-G members. In 2021, ENTSO-G will further progress in assessing the tolerance for different levels of hydrogen concentration in the gas grid system and analyse the feasibility and verification of all pathways (hydrogen backbone, methane backbone, and Hydrogen/Methane blended networks).

ENTSO-G continued its dialogue with stakeholders along the gas value chain in the field of gas quality and hydrogen and delivered a workshop on this matter at the beginning of 2020.

Furthermore, in Q3 2020, relevant stakeholders of the gas value chain were invited to participate in a dedicated prime movers’ group on gas quality handling to discuss the development of innovative and feasible ways to handle gas quality in fluctuating blends, as well as pure hydrogen grids in our future gas system, and the main technical challenges foreseen. The final stage will



be to reach a better understanding on the main principles to handle gas quality related to renewable, decarbonised and low-carbon gases; and that can optimise the diversification of supplies, decarbonisation of the grid and guarantee end-user safety and access to the product they require. The process is facilitated by ENTSOG along with DSOs associations (Eurogas, Geode, CEDEC, GD4S).

GAS QUALITY OUTLOOK FOR TYNDP 2020

As part of the TYNDP 2020 publication, in 2019 ENTSOG started working on the Gas Quality Outlook 2020 report. This report was finalised and published in Q4 2020 along with TYNDP 2020 report. One of the main improvements in this edition is the inclusion of an extended section about the effect of different hydrogen volume fractions (i.e. 2 %, 5 %, 10 %, 15 %, 20 %) on WI and GCV ranges.

CYBERSECURITY

ENTSOG has collaborated with GIE on the Cybersecurity Taskforce to build a common understanding on the key areas identified by the EC regarding a potential Network Code on cybersecurity for the energy sector, as follows:

- ▲ European Cybersecurity Maturity Framework
- ▲ Supply Chain Management
- ▲ European Early Warning System for Cyber Threats
- ▲ Cross-Border and Cross-Organisational Risk Management

Furthermore, ENTSOG and GIE investigated among their members the implementation status of the NIS directive. This information will be used for the upcoming steps within this task force. Work will continue in this area throughout 2021.

INTEROPERABILITY & DATA EXCHANGE NETWORK CODE IMPLEMENTATION AND EFFECT MONITORING

From 2016, as per Article 8(8) of Regulation (EC) No 715/2009, and Article 25 of the INT & DE NC, ENTSOG is executing the task of monitoring and analysing how TSOs are progressing in implementing the Network Code for Interoperability & Data Exchange (INT & DE NC). ENTSOG reviewed TSOs' data twice in the implementation monitoring reports (IMR) of 2016 and 2017 (published in 2016 and 2018). In August 2020 ENTSOG published a follow-up report that reflected the results of implementation of INT & DE NC by the end of 2019. As a complementary part of the IMR-2019, a list of Interconnection Points (16 IPs) had been selected for a detailed assessment of IAs' compliance with the INT & DE NC. By the end of 2019, ENTSOG asked TSOs to provide an updated set of information (as a questionnaire) on IPs and their IAs compliance with the INT & DE NC. 41 TSOs provided all necessary input, which allowed ENTSOG to fulfil its monitoring and reporting

obligations for 2019 – published by ENTSOG in the second half of 2020. The main criteria of IPs' eligibility for the Implementation Monitoring Report (IMR) are that TSOs operate IPs within the EU. Based on the input received from TSOs, the IMR shows that 67 out of 69 IPs are covered with IAs between adjacent TSOs. Two IPs are missing IAs: IP Petrzalka (AT–SK) is not in operation; IP Negru Voda II, III (RO) / Kardam (BG) is in operation, although “missing technical and legal conditions necessary for an IA.” The implementation process for the later IP is in progress (according to comments from the adjacent TSOs).

The evidence gathered confirms significant results achieved by TSOs. With only few minor procedures that are still in progress, all analysed IPs are operated in accordance with the INT & DE NC.

IPS' STATUS WITHIN EUROPEAN UNION BY THE END OF 2019 AND RESULTS PUBLISHED IN 2020

IP status	Number of IPs	Comments
IPs between EU TSOs within the European Union	69	IPs are subject to the IMR 2019-
IPs in operation with IA	67	<ul style="list-style-type: none"> – One IP with derogation of INT & DE NC requirements expired by the end 2019 – Two IPs became parts of common balancing zones – One IP in derogation became a part of a common balancing zone
IP in operation without IA	1	Missing technical and legal conditions necessary for an IA
IP not in operation	1	A new IP. Never in operation

INT & DE NC, CHAPTER II. INTERCONNECTION AGREEMENTS

Analysis of TSO replies and IA review indicate that, during the last two years, the adjacent TSOs have done significant work on improving IAs and documenting their mutual agreements on the main terms and conditions envisaged in the INT & DE NC. 63 % of the existing IAs have been amended with added provisions to the IAs that cover at least the terms and conditions defined in articles 6–12 of the INT & DE NC. In 97 % of the cases, TSOs fulfilled their obligations (according to Article 4 INT & DE NC) to inform Network Users about IA provisions that may directly affect the said Users. The remaining 3 % are in progress.

For the majority of IAs, the “Rules for flow control” (Article 6) and “Measurement principles” (Article 7) have been taken into consideration as stated in the INT & DE NC.

The various requirements stemming from Article 6 (flow control, safety legislation, emergency plans, preventive action plans etc.) are 82 %–99 % covered in the IAs. The remaining percentages represent mainly “Not applicable” answers with TSOs' clarifying comments that the rules are “not included in IAs but existing in other technical and legal documentation.”

Replies regarding Article 7 INT & DE NC “Measurement principles for gas quantity and quality” show 90–99 % TSOs’ compliance with all paragraphs of the article. The remaining percentages indicate that the work is mainly “In progress”.

Paragraphs of Article 8 INT & DE NC “Rules for the matching process” received 95–99 % compliance replies. 56 % of TSOs specified a flow control equipment operator responsible for the matching process, 40 % reported that “roles are designated between the partners”, 4 % described the work “In progress”.

In most of the IAs, the “lesser rule” has been implemented as the matching rule (96 %), and the operational balancing account (OBA) as the allocation rule (97 %).

Compliance with Article 10 INT & DE NC “Agreements on communication procedures in case of exceptional events” has been reported in 97 % of cases.

Compliance with Article 11 INT & DE NC “Settlement of disputes” has been reported by 96 % of TSOs.

Compliance with Article 12 INT & DE NC “Amendment process” has been reported by 95 % of TSOs.

INT & DE NC, CHAPTER III. UNITS

Compliance with Article 13 INT & DE NC “Common set of units” used for data exchange and publication has been reported by 92 % of TSOs.

INT & DE NC, CHAPTER IV. GAS QUALITY AND ODOURISATION

According to the results, TSOs are 100 % compliant with the requirements of Articles 15 and 19 of the INT & DE NC that cover gas quality and odourisation issues and prescribe instruments for managing cross-border trade restrictions due to differences of gas quality or odourisation practices. No cross-border trade restrictions due to differences in gas quality or odourisation practices have been reported.

89 % of the TSOs comply with the obligations of Article 16, INT & DE NC regarding publication of the gas quality parameters WI and GCV on an hourly basis for each entry IP.

For Article 17 INT & DE NC “Information provision on short-term gas quality variation”, as applies to the relevant entitled parties, TSOs reported 85 % compliance and 15 % “No” answers with clarifying comments that these TSOs do not have any party that falls under the eligibility criteria according to paragraph 17.2. Therefore, they are not obliged to define and maintain a list of parties according to paragraph 17.3. (a). 48 % of TSOs reported providing WI to the relevant parties, 65 % of TSOs share GCV, and 43 % of TSOs provide information about the full composition of gas. The main way to communicate data is to publish it on TSOs website 53 %; second most frequently applied communication method is the Industrial or B2B protocol – 28 %.

INT & DE NC, CHAPTER V. DATA EXCHANGE

The results published in 2020 show that all TSOs have met the data exchange security requirements as stated in Article 22 of the INT & DE NC. In reference to Article 23.2 INT & DE NC Other Data Exchange Solution than Art 21, 12 TSOs reported that, besides the Document Based Data Exchange solution (AS4, EDIG@s xml), they are still using other data exchange solutions than those defined in Article 21 for data exchange requirements envisaged in point 2.2 of Annex I to Regulation (EC) No 715/2009, CAM/CMP NC, BAL NC, REMIT and INT & DE NC. Following requirements

of Article 24 INT & DE NC “Development process for common network operation tools”. All 12 TSOs reported that they are in progress to implement to common data exchange solution, 37 TSOs implemented the Common Data Exchange Solution as defined in ENTSOG’s Common Data Exchange Solution Table. The remaining TSOs reported the implementation work is in progress with temporary use of the optional solutions approved by NRAs.

6

STRATEGY, POLICY AND COMMUNICATION



With publication of the European Green Deal, the major task of the Strategy, Policy and Communication (SPC) business area is to facilitate stakeholder dialogue and value chain cooperation, particularly the framework at the basis of EC's Energy System Integration and the Hydrogen strategies. The EC is also planning its upcoming package of Hydrogen and Gas markets Decarbonisation package of legislation - active participation in these discussions is crucial at this time.

The SPC business area addresses:

- ▲ the identification of strategic aspects,
- ▲ policy monitoring,
- ▲ communication service.

The SPC business area supports managerial activities by provision of information sharing of resources, networks and relevant knowledge to organise internal ENTSOG strategic debate. SPC oversees promotion of ENTSOG activities to its members and the external environment, by involving relevant stakeholders, by contributing to consultations, participating in conferences and fora as discussion partner or speaker, but also by maintaining a close dialogue with media representatives. ENTSOG SPC develops and manages relevant partnerships with research centres, for example:

Florence School of Regulation, Delta Energy Institute, Copenhagen School of Infrastructure and think tanks.

The new area monitors numerous European Commission's studies, consultations and stakeholder workstreams including dialogue ahead of Madrid, Florence and Copenhagen Fora. The area coordinates all the external communications of ENTSOG, including management and preparation for public appearances related to future of the European infrastructure.

SPC also coordinates annually the ENTSOG Annual Report and the ENTSOG Annual Work Programme, with input from the Business Areas. ENTSOG's annual conferences ENTSOG's are coordinated by SPC each year since 2017 and ENTSOG's social media activity is managed by the business area.

WORK STRUCTURE

The ENTSOG G2020 TF is responsible for coordinating ENTSOG's activities related to work on the parts of the European Green Deal - legislative actions, policy communications, action plans announced by the EC or other, as requested by the ENTSOG Board.

The TF will be active at least to the end of the work on the Green Deal regulatory and legal developments.

The TF meets on a monthly basis, with an option for ad-hoc meetings, if required. The TF is managed by the ENTSOG SPC, with close cooperation of other ENTSOG business areas. Ad-hoc activities may be addressed to the G2020 TF as determined by the Board and/or GA.



Figure 11: G2020 Task Force



ACTIVITIES

The G2020 Task Force is responsible for coordinating ENTSOG's activities related to work on the parts of the European Green Deal which will be relevant for and impacting the gas infrastructure. In 2020, the Task Force coordinated these activities in close cooperation with the relevant ENTSOG Working Groups, the ENTSOG Business Areas and coordinators of ENTSOG strategic topics. It provided the prioritisation and policy overview of the European Commission files for decision by the ENTSOG Board.

The TF continued in 2020 to cover ENTSOG's engagement in the ENTSOG 2050 Roadmap which was published in 2019, by facilitating associated communication and stakeholder dialogue via organisation of three respective stakeholder webinars. Based on the feedback received from stakeholders, the ENTSOG 2050 Roadmap Action Plan was developed with consideration of the European Commission's Energy System Integration and Hydrogen Strategies. It identifies three key principles will reinforce European gas TSOs commitments to deliver on Europe's energy and climate objectives. These principles are delivering Europe's future energy networks (Infrastructure); having the same market principles for all gases including hydrogen (markets); and gas TSOs as system integrators in the emerging hybrid energy system.

In 2020 the TF was responsible for providing EU policy proposals and updates on the preparations for the European Green Deal developments and on upcoming reopening of gas related legislation expected in 2021/2022. The TF has informed the ENTSOG members on all the relevant EC studies, forming the background to any associated impact assessments.

In 2020, strategic focus areas for ENTSOG under the European Green Deal were identified related to relevant legislative actions, policy communications, action plans announced by the EC any other topic, as requested by the ENTSOG Board. The TF has provided update about the positions of important stakeholders, including Gas Infrastructure Europe, New Gases Network, electricity, gas and hydrogen value chain representatives.

Also undertaken in 2020 – the development of policy proposals legal text proposals based on the outcome of the stakeholders' dialogue on ENTSOG 2050 Roadmap for gas grids. These focused on gas- and hydrogen market design, energy system integration and sector coupling, gas quality and hydrogen handling, methane emissions and other strategic topics. The TF has coordinated those deliverables linked with ENTSOG strategic topics.

7

ENTSOE MANAGEMENT SUPPORT



The management team has five support groups which provide compliance, financial and other services across the association. These are Legal, Financial, HR, IT and Administration.

ACTIVITIES

In 2020, the Management Support Team continued to provide support to the Business Areas and management in Brussels, and work with ENTSOG members. Support is through the Legal, HR, Finance, and IT functions to ensure there is a robust platform for the activ-

ities and deliverables of ENTSOG's Business Areas. They are also responsible for organisation of the meetings of the GA and the Board, as well as those for the Liaison Group, the Legal Advisory Group, and the Financial Committee.

LEGAL

The Legal Team, either internally or together with the Legal Advisory Group (LAG), which meets on a monthly basis, contributes to the work and deliverables of all the Business areas. This includes the interpretation of Network Codes and other legal texts applicable to ENTSOG and the TSOs as well as the support to the other Business areas for addressing Network Codes Functionality Platform issues. Other work undertaken is the analysis of potential mirroring from electricity (the Clean Energy Package) to gas legislation and development of regulatory input for the upcoming gas legislative package. The LAG has contributed to ENTSOG 2050 Roadmap Action Plan and its work on Certificates and Guarantees of Origin for renewable and decarbonised gases.

In 2020, the Legal Team were involved in the organisation of workshops and follow up discussion with Market Team and ACER on balancing suspected misconduct cases, the participation in external consulta-

tion and studies launched by the EC and ACER, and REMIT activities of ENTSOG. The LAG also issued formal recommendations to the Board and GA with respect to the applications for membership, Associated Partner membership and for Observer membership.

In 2020, the Legal Team, with the other areas, organised the two additional meetings of the External Contact Platform (ECP) in June and November. The ECP was created by ENTSOG and the Energy Community Secretariat to strengthen the cooperation between ENTSOG and other non-EU gas transmission gas companies. The scope focus on coordination and technical cooperation between ENTSOG and other non-EU gas transmission system operators, as framed by Regulation 715/2009. Finally, the Legal Team also ensured the internal day to day way of working of ENTSOG by contributing to the organisation of the GA and Board meetings and assisting the HR and communication services as well as the management.

HR AND FINANCE

ENTSOG Human Resources continued with a well-prepared recruitment process, so that the relevant resources and competences were in place to perform the requested activities. ENTSOG has a strong focus on the resource allocation as well as the relevant hand-over processes to ensure the performance of the

organization vis-à-vis the required deliverables. With regards to financial reporting, ENTSOG created and implemented clear and efficient accounting procedures and controls in 2020. ENTSOG's Financial Statement for 2020 is included in this report.

IT

The ENTSOG IT team provides IT support and services to the ENTSOG team (i. e., management and the Business Areas), its members and other ENTSOG stakeholders (e. g., ACER, EC).

The list of the main IT projects for 2020 include the following:

- ▲ Data warehouse (PDWS) and TP Migration to the Cloud (Microsoft Azure) – development started in 2020 and will be finished and delivered in Q2 2021.
- ▲ TP Upgrade to newer version of technologies.
- ▲ Developing Geographical Information Systems (GIS) software for the System Development projects (built on ESRI ArcGIS).
- ▲ PDWS (data warehouse) and TP Performance enhancements.
- ▲ Update of the UMM portal on TP including application for becoming an IIP.
- ▲ Developing the Projects Data Collection Portal for TYNDP 2020 and PCI.
- ▲ Open discussions and gathering requirements for the new/updated collaboration tool for emergency situations.

- ▲ Initial setup of PLEXOS simulation tool for System Development team.
- ▲ Developing and collaborating with ACER on the new GASNCFUNC 2.0 platform.
- ▲ SharePoint improvements to the collaboration platform with the Members.
- ▲ Improvements to office IT software and hardware.

In addition, ENTSOG is moving their reporting capabilities to the Microsoft platform called Power BI. In 2020, some internal reports were migrated - this will continue in 2021 with more reports.

Beside the above listed projects, the IT team also have worked on recurrent projects in 2020 – the TYNDP 2020, Project Submission Portal, Capacity Transmission Map, and Summer/Winter Outlook/Review data collections.

8

RESEARCH AND DEVELOPMENT AT ENTSOG



Each year, ENTSOG aims to improve and progress its way of working, by assessing its tools, methodologies and approaches, some of which are summarised below.

In 2020 and beyond, ENTSOG works closely with its Members to develop innovative products and services to facilitate the future role of gas in the overall European energy mix and to meet energy and climate targets. There will be challenges such as dealing with fluctuating gas quality, growing renewable, low-carbon and decarbonised gases content, framing the proper conditions for connecting low carbon, decarbonised and renewable gas production, planning for hydrogen and biomethane being used in gas grids or designing new data flows between TSOs and DSOs. Nevertheless, gas systems offer long-distance transportation, long-term energy storage, decarbonisation potential and short-term demand management support tools.

Innovative work continued in 2020 by ENTSOG and its Members, to ensure readiness and facilitate those developments going forward.

STRATEGIC ENERGY TECHNOLOGY (SET) PLAN COLLABORATION

The EC defined a roadmap for accelerating the European energy System Transformation through an Integrated Strategic Energy Technology (SET) Plan as a tool to deliver cost reduction and improvement of performance of low-carbon technologies through synergistic innovation actions. An Implementation Working Group (IWG6) on Energy Efficiency in Industry was created to include representatives from Member

States, industry and various European Commission DGs. On 25 June 2020 ENTSOG became a Member of this Implementation Working Group (IWG6). ENTSOG is engaged in providing feedback to the new Implementation Report and specifically on the newly created area – ‘Enablers’. This has allowed ENTSOG’s R&D agenda to progress.

RE-STREAM STUDY

ENTSOG, CONCAWE, GIE, and IOGP launched in 2020 the Re-Stream study to address the reuse of both onshore and offshore oil and gas infrastructure for

hydrogen and Carbon Capture and Storage. The study is being undertaken by Carbon Limits and DNV and results are expected to be published in 2021.

APPROACHES ON ADDRESSING HYDROGEN IN THE GAS GRIDS

In 2020, ENTSOG produced an internal assessment setting out ENTSOG’s current understanding of the technical opportunities and challenges with an increased penetration of hydrogen in gas grids. The assessment is intended to serve as a starting point to further investigate the technical feasibility of hydrogen blends and other renewables in gas transmission systems across EU. Based on the findings, TSOs are working towards increasing their knowledge for

operating hydrogen grids, supported by ENTSOG internal knowledge sharing sessions but also through facilitating information sharing and discussion between stakeholders along the value chain. Further details are provided in Section Gas Quality and Hydrogen of this report.

CONSIDERATION AND ASSESSMENT OF TYNDP 2020 ENERGY TRANSITION (ETR) PROJECTS, INCLUDING HYDROGEN PROJECTS

To support Europe's climate and energy ambitions, ENTSOG have collected and assessed projects contributing to the decarbonisation of the gas system on a transparent and non-discriminatory basis.

For this first exercise in TYNDP 2020, ENTSOG collected a relatively large number of projects. Submitted ETR projects reflect the wide variety of solutions needed to decarbonise the energy sector, from renewable generation to demand conversion including CO₂

storage and infrastructure conversion. Based on the information collected, ENTSOG has estimated that TYNDP 2020 ETR projects can contribute to more than 400 Mt CO₂ savings per year. Since the ETR projects collection is not a regulatory requirement, they were submitted to ENTSOG on a voluntary basis. Therefore, the assessment is not comprehensive and the impact of the assessed ETR projects can be considered as the beginning of this work.

ENTSOG TYNDP 2020 DEDICATED WEBSITE AND VISUALISATION PLATFORM

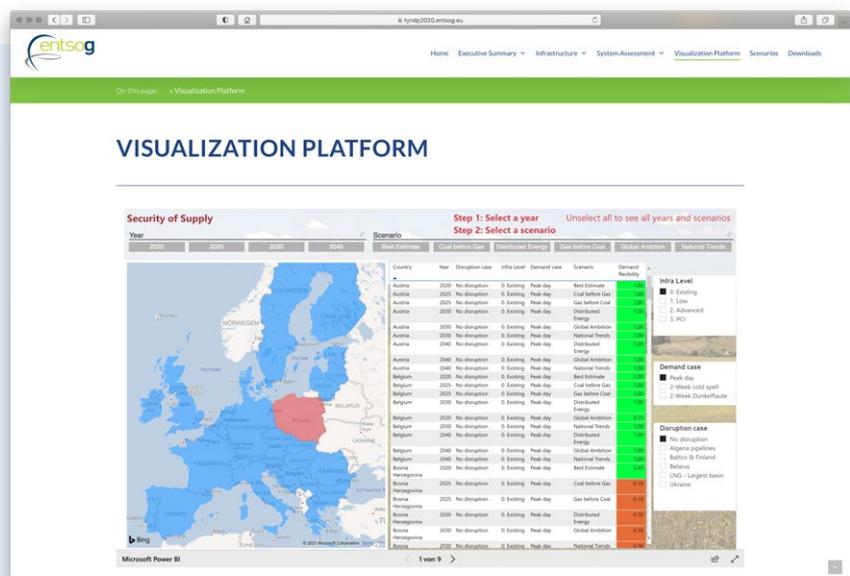
To ensure a maximum level of transparency and outreach to external stakeholders in the most efficient way, ENTSOG has developed a **website dedicated to TYNDP 2020** – all reports and results can be easily accessed or downloaded. This was the first time that a dedicated website was developed for the TYNDP, associated reports and annexes. The website also

provides a **visualisation platform** which allows stakeholders to select from the extensive data set produced for the TYNDP infrastructure assessment and display them in different ways. This platform provides a better user interface, and it is possible to view all simulation results, for all years, and all scenarios of the TYNDP 2020.

tyndp2020.entsog.eu



Visualisation platform



A NEW NETWORK SIMULATION TOOL FOR ENTSOG

ENTSOG investigated in 2019 the possibility to identify a new simulation tool to use when developing the Summer and Winter Outlook report simulations, as well as TYNDP and other possible functions. In 2020, ENTSOG selected PLEXOS, a simulation tool developed by Energy Exemplar, as the most suitable for its

modelling needs. This tool will allow ENTSOG to address potential new needs for TYNDP 2022 and to interlink multiple energy sectors like electricity and gases (including hydrogen). Progress will continue using this tool into 2021 and beyond.

9

ENTSOG BOARD AND TEAMS



ENTSOG BOARD

On 25 June 2020, ENTSOG General Assembly approved the nomination as Members of ENTSOGs Board as of 1 July 2020, of:

- ▲ Mr. Szabolcs I. Ferencz (FGSZ Ltd.) replacing Mr. Vedran Špehar (Plinacro Ltd.); and,
- ▲ Mr. Olli Sipilä (Gasgrid Finland Oy) replacing Mr. Andreas Rau (NET4GAS s.r.o.).

On 2 April 2020, the ENTSOG General Assembly approved as ENTSOG Observers:

- ▲ LLC Gas Transmission System Operator of Ukraine
- ▲ Transitgas AG, Switzerland

On 10 December 2020, the ENTSOG General Assembly approved Conexus Baltic Grid as an ENTSOG (full) Member as of 1 January 2021.

Listed below are ENTSOG Board members, as of 31 December 2020



Stephan Kamphues, President
(OGE/Vier Gas Transport GmbH)



Miroslav Bodnár
(eustream a.s.)



Pascal De Buck
(Fluxys Belgium S.A.)



Francisco de la Flor Garcia
(Enagás S.A)



Bart Jan Hoevers
(Gasunie Transport Services B.V.)



Gaetano Mazzitelli
(Snam Rete Gas S.p.A.)



Chris Logue
(National Grid Gas plc.)



Szabolcs I. Ferencz
(FGSZ Ltd)



Olli Sipilä
(Gasgrid Finland Oy)



Tomasz Stepień
(GAZ-SYSTEM S.A.)



Harald Stindl
(Gas Connect Austria)



Thierry Trouvé
(GRTgaz)



Christoph von dem Bussche
(GASCADE Gastransport GmbH)

ENTSOG TEAMS

Status as of 31 December 2020

MARKET TEAM



Alessia D'Addabbo
Adviser, Market Codes



Kateryna Dolzhenko
Adviser, Market Development



David Gil
Adviser, Market Development



Matt Golding
Director, Market



Madeleine Hammerman
Adviser, Market Codes



Seán Kinsella
Adviser, Market Development



Alexandra Kiss
Senior Assistant, Office & Web Support



Claude Mangin
Market Development Subject Manager



Irina Oshchepkova
Market Codes Subject Manager



Laurent Percebois
Adviser, Market Codes



Constanza Troiano
Adviser, Market Codes

SYSTEM DEVELOPMENT TEAM



Stefano Astorri
Investment Subject Manager



Magdalena Bogucka
Adviser, System Development



Anne Boorsma
Director, System Development



Maria Castro
Adviser, System Development



Paula Di Mattea
Adviser, System Development



Maria Fernandez
Scenario Adviser, System Development



Alexander Kättlitz
Scenario Adviser, System Development



Anna Keri
Assistant



Rares Mitrache
Adviser, System Development



Jacques Reberol
Modelling Subject Manager, System Development



Cihan Sönmez
Scenario Subject Manager



Louis Watine
Deputy Director, System Development



Kacper Żeromski
Adviser, System Development

SYSTEM OPERATION TEAM



Lilia Jakobsson
Adviser, Interoperability



Anna Keri
Assistant



Anton Kolisnyk
Adviser, Interoperability



Viktoria Medvedeva-
Tšernobrivaja Adviser, Transparency



Kathrine Nygaard Stannov
Transparency Subject Manager



Hendrik Pollex
Director, System Operation



Rosa Puentes
Adviser, System Operation



Thilo von der Grün
Adviser, Interoperability



Marin Zwetkow
Subject Manager
Interoperability & Data Exchange

STRATEGY, POLICY & COMMUNICATION TEAM



Carmel Carey
External Communication Manager



Alexandra Kiss
Senior Assistant, Office & Web Support



Patricia Orglervoa
Policy Adviser



Sara Piskor
Director, Strategy, Policy & Communication

MANAGEMENT SUPPORT TEAM



Mauro Barbosa
Assistant



Maria Dhénin
Executive Coordinator



Bogdan Gugescu
IT Manager



Alexandra Kiss
Senior Assistant, Office & Web Support



Areti Kostaraki
Lead Legal Adviser



Agata Musial
Finance & Admin Manager



Nicolas Van der Maren
Legal Manager

MANAGEMENT



Stephan Kamphues
President



Jan Ingwersen
General Director

ENTSOG FINANCIAL STATEMENT 2020

The Financial Statement 2020 was approved by the ENTSOG General Assembly on 27 April 2021.

Due to a change in accounting software by ENTSOG in 2020, it is not possible to provide comparison of figures between 2019 and 2020. Comparison between two sets of years will be provided in the forthcoming Annual Report 2021 and in future editions.

Values EUR	Note	2020
ASSETS		
FORMATION EXPENSES	20	
FIXED ASSETS	21/28	185,853.18
Intangible fixed assets (explanation 6.1.1)	21	
Tangible fixed assets (explanation 6.1.2)	22/27	185,353.18
Land and buildings	22	
Plant, machinery and equipment	23	
Furniture and vehicles	24	140,373.48
Leasing and similar rights	25	
Other tangible fixed assets	26	44,979.70
Assets under construction and advance payments	27	
Financial fixed assets (explanation 6.1.3)	28	500.00
CURRENT ASSETS	29/58	2,943,100.41
Amounts receivable after more than one year	29	
Trade debtors	290	
Other amounts receivable	291	
Stocks and contracts in progress	3	
Stocks	30/36	
Contracts in progress	37	
Amounts receivable within one year	40/41	39,372.51
Trade debtors	40	39,372.51
Other amounts receivable	41	
Current investments	50/53	
Cash at bank and in hand	54/58	2,853,727.90
Deferred charges and accrued income	490/1	50,000.00
GL accounts not in the standard Belgian schema	AXX	
TOTAL ASSETS	20/58	3,128,953.59

EQUITY AND LIABILITIES

EQUITY	10/15	1,735,107.02
Contribution (explanation 6.7.1)	10/11	619,892.00
Capital	10	619,892.00
Issued capital	100	619,892.00
Uncalled capital	101	
Out of capital	11	
Share premium	1100/10	
Other	1109/19	
Revaluation surpluses	12	
Reserves	13	300,000.00
Unavailable reserves	130/1	
Legal reserve	130	
Reserves not available in respect of own shares held	1311	
Own shares acquisitions	1312	
Financial support	1313	
Other	1319	
Untaxed reserves	132	
Available reserves	133	300,000.00
Accumulated profits (losses)	(+)/(-) 14	815,215.02
Investment grants	15	
Advance to associates on the sharing out of the assets	19	
PROVISIONS AND DEFERRED TAXES	16	
Provisions for liabilities and charges	160/5	
Pensions and similar obligations	160	
Fiscal costs	161	
Big repair and maintenance	162	
Environmental obligations	163	
Provisions for liabilities and charges (explanation 5.4)	164/5	
Deferred taxes	168	

EQUITY AND LIABILITIES

AMOUNTS PAYABLE	17/49	1,393,846.57
Amounts payable after more than one year (explanation 6.3)	17	
Financial debts	170/4	
Credit institutions, leasing and other similar obligations	172/3	
Other loans	174/0	
Trade debts	175	
Advance payments received on contract in progress	176	
Other amounts payable	178/9	
Amounts payable within one year (explanation 6.3)	42/48	1,158,013.57
Current portion of amounts payable after more than one year falling due within one year	42	
Financial debts	43	
Credit institutions	430/8	
Other loans	439	
Trade debts	44	1,062,315.87
Suppliers	440/4	1,062,315.87
Bills of exchange payable	441	
Advance payments received on contract in progress	46	
Taxes, remuneration and social security	45	95,697.70
Taxes	450/3	-89,570.45
Remuneration and social security	454/9	185,268.15
Other amounts payable	47/48	
Accruals and deferred income	492/3	235,833.00
GL accounts not in the standard Belgian schema	BXX	
TOTAL LIABILITIES	10/49	3,128,953.59

INCOME STATEMENT

Operating income and charges			
Gross operating margin	(+)/(-)	9900	2,198,183.82
Including: non-recurring profit		76A	
Turnover		70	8,860,095.89
Raw materials, consumables, services and other goods		60/61	6,661,912.07
Remuneration, social security costs and pensions (explanation 6.4)	(+)/(-)	62	1,574,529.92
Depreciation of and other amounts written off formation expenses, intangible and tangible fixed assets		630	78,013.82
Amounts written off stocks, contracts in progress and trade debtors: Appropriations (write-backs) (+)/(-)		631/4	
Provisions for liabilities and charges: Appropriations (uses and write-backs)	(+)/(-)	635/8	
Other operating charges		640/8	10,807.89
Operating charges carried to assets as restructuring costs	(-)	649	
Non-recurring costs		66A	
Operating profit (loss)	(+)/(-)	9901	534,832.19
Financial income (explanation 6.4)		75/76B	28.22
Recurring financial profit		75	28.22
Including: capital and interests subsidies		753	
Non recurring profit		76B	
Financial charges (explanation 6.4)		65/66B	9,361.89
Recurring financial costs		65	9,361.89
Non recurring financial costs		66B	
Gain (loss) for the period before taxes	(+)/(-)	9903	525,498.52
Transfer from deferred taxes		780	
Transfer to deferred taxes		680	
Income taxes	(+)/(-)	67/77	
Gain (loss) of the period	(+)/(-)	9904	525,498.52
Transfer from untaxed reserves		789	
Transfer to untaxed reserves		689	
GL accounts not in the standard Belgian schema		WXX	
Gain (loss) of the period available for appropriation	(+)/(-)	9905	525,498.52
APPROPRIATION ACCOUNT			
Profit (loss) to be appropriated	(+)/(-)	9906	525,498.52
Gain (loss) of the period available for appropriation	(+)/(-)	(9905)	525,498.52
Profit (loss) brought forward	(+)/(-)	14P	
Withdrawals from capital and reserves		791/2	
Transfer to capital and reserves		691/2	
to capital and share premium account		691	
to legal reserve		6920	
to other reserves		6921	
Profit (loss) to be carried forward	(+)/(-)	(14)	525,498.52
Owners' contribution in respect of losses		794	
Profit to be distributed		694/7	
Dividends		694	
Directors' or managers' entitlements		695	
Employees		696	
Other beneficiaries		697	
Non-connected accounts		XXX	

PRESS RELEASES AND STAKEHOLDER WORKSHOPS 2020

PRESS RELEASES

08 Jan	ENTSOE and ACER launch consultation on FUNC issue 'missing harmonisation of interfaces on capacity platforms'
20 Jan	ENTSOE launches its report on the first incremental capacity process cycle
24 Feb	Gas TSOs of the Central Eastern Europe (CEE) region publish their Gas Regional Investment Plan 2019
23 Mar	ENTSOE and GIE Members maintain gas infrastructure operations during coronavirus (Covid-19) pandemic
22 Apr	ENTSOE publishes its second Tariff Network Code (TAR NC) monitoring report
27 Apr	ENTSOE Publishes Summer Supply Outlook 2020 and Summer Supply Review 2019
06 May	Gas TSOs of the Southern Corridor region publish the 4 th edition of their Gas Regional Investment Plan
11 May	ENTSOE publishes list of PS-CBA groups for TYNDP2020
14 May	ENTSOE issues Final Call to submit Energy Transition Related projects to TYNDP 2020
04 Jun	ACER and ENTSOG publish solution on FUNC issue reported auction restrictions
23 Jun	Gas TSOs of the North West Region publish the 4 th edition of their Gas Regional Investment Plan
29 Jun	ENTSO-E and ENTSOG publish their final Joint Scenarios for TYNDP 2020 and open registration for public webinar
30 Jun	ENTSOE publishes its Annual Report 2019 and Monitoring Report for the Balancing Network Code
01 Jul	Upgraded Gas Network Codes Functionality Platform launched by ACER and ENTSOG
05 Aug	ENTSOE opens public stakeholder consultation on its Annual Work Programme (AWP) 2021
07 Aug	ENTSOE publishes third Interoperability & Data Exchange Rules NC Implementation Monitoring Report
21 Sep	ACER and ENTSOG consult on their recommendations to mitigate suspected misconduct in EU gas balancing markets
08 Oct	ENTSOE publishes its Winter Supply Outlook 2020/21 and Winter Supply Review 2019/20
08 Oct	ENTSOE publish its '2050 Roadmap Action Plan' to deliver on European Commission's Energy System Integration and Hydrogen Strategies
09 Oct	ENTSOE publishes its 2020 Addendum to the Union-wide simulation of gas supply and infrastructure disruption scenarios (SoS simulation) report
03 Nov	ENTSO-E and ENTSOG launch public consultation on their draft TYNDP 2022 scenario storylines
25 Nov	ENTSOE publishes draft TYNDP 2020 and open consultation

04 Dec	ENTSOG online platform is opened for submission of gas project candidates for the EC 5 th EU PCI list
10 Dec	ENTSOG hosted its online Annual Conference 'Future of Gas Grids' on 8 December 2020
11 Dec	ACER and ENTSOG publish two solutions on the Functionality Platform
16 Dec	ENTSOG publishes its Annual Work Programme 2021
18 Dec	ACER and ENTSOG launch a new joint public consultation on the Functionality issue 'Greater flexibility to book firm capacity at Interconnection Points'

ENTSOG STAKEHOLDER CONSULTATIONS AND WORKSHOPS 2020

08 Jan	Interoperability	Public Consultation on the reported FUNC issue "Missing harmonisation of interfaces on capacity platforms"
18 Jan	Market Codes	ACER and ENTSOG launched a joint public consultation for the FUNC issue 'Greater flexibility to book firm capacity at IPs'.
Feb–April	Market Codes & Interoperability	FSR /ENTSOG online Gas Network Codes course
10–26 March	Energy Transition	Three stakeholder workshops on ENTSOG 2050 Roadmap for Gas Grids
03 July	TYNDP	ENTSOG and ENTSO-E workshop on TYNDP Scenarios – Closing 2020 edition, commencing 2022 cycle
21 Sep–3 Nov	Market Codes	Joint ACER/ENTSOG Public Consultation on ACER-ENTSOG Public Consultation on joint recommendations to mitigate potential suspected misconduct in EU gas balancing markets.
05 Aug	General	Stakeholder consultation on its Annual Work Programme (AWP) 2021
Sep–Dec	Gas Quality	Prime mover GQ & H2 sessions with stakeholders
19 Nov	Transparency	14 th Transparency workshop
01 Dec	Interoperability	3 rd Joint ENTSOG/EASEE-gas workshop on Data Communication Harmonisation for Gas Transmission
02 Dec	TYNDP	ENTSO-E & ENTSOG TYNDP 2022 Scenarios Draft Storyline Report Stakeholder Consultation Workshop
08 Dec	Energy Transition	ENTSOG Annual Conference 2020: Future of Gas Grids
16 Dec	TYNDP	Draft TYNDP 2020 public consultation webinar
18 Dec	Market Codes	ACER and ENTSOG joint public consultation on the Functionality issue 'Greater flexibility to book firm capacity at Interconnection Points'

LIST OF ABBREVIATIONS

ACER	Agency for the Cooperation of Energy Regulators
AR	Annual Report
ARIS	ACER's REMIT Information System
AWP	Annual Work Programme
BAL KG	Balancing Kernel Group
BAL NC	Balancing Network Code
BP	Booking Platform
CAM NC	Capacity Allocation Mechanism Network Code
CAP KG	Capacity Kernel Group
CBA	Cost-Benefit Analysis
CCS	Carbon Capture Storage
CCUS	Carbon Capture, Utilisation and Storage
CEN	European Committee for Standardisation
CIO	Central Issuing Office
CMP GL	Congestion Management Procedures Guidelines
CNOT	Common Network Operational Tool
EASEE-gas	European Association for the Streamlining of Energy Exchange - gas
EC	European Commission
ECP	External Contact Platform
EEA	European Economic Area
EFTA	European Free Trade Association
EIC	Energy Identification Code
EnC	Energy Community
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
ETS	European Trading Scheme
ETR	Energy Transition
EU	European Union
FDA UIOLI	Firm-Day Ahead Use It Or Lose It
FSR	Florence School of Regulation
FUNC	Gas Network Codes Functionality Platform
GA	General Assembly
GCG	Gas Coordination Group
GCV	Gross Calorific Value
GIE	Gas Infrastructure Europe
GHG	Greenhouse Gases
GIS	Geographical Information System
GO	Guarantee of Origin

GO KG	Guarantee of Origin Kernel Group
IAs	Interconnection Agreements
INT WG	Interoperability Working Group
INV WG	Investment Working Group
IP	Interconnection Point
KG	Kernel Group
LAG	Legal Advisory Group
LIO	Local Issuing Office
LT UIOLI	Long-Term Use It Or Lose It
LNG	Liquefied Natural Gas
MC WG	Market Codes Working Group
MD WG	Market Development Working Group
MS	Member State
NC	Network Code
NeMo KG	Network Model Kernel Group
NRA	National Regulatory Authority
OBA	Operational Balancing Account
PCI	Project of Common Interest
R&D	Research and Development
ReCo	Regional Coordination System for Gas
REMIT	Regulation (EU) No 1227/2011 on wholesale energy market integrity and transparency
RES	Renewable Energy Sources
RRM	Registered Reporting Mechanism
SCN WG	Scenario Working Group
SET	Strategic Energy Technology
SoS	Security of Supply
SPC	Strategy, Policy and Communication
TAR KG	Tariff Kernel Group
TAR NC	Tariff Network Code
Tariff Idoc	Tariff Network Code Implementation Document
TP	Transparency Platform
TRA WG	Transparency Working Group
TSO	Transmission System Operator
TYNDP	Ten-Year Network Development Plan
UMM	Urgent Market Message
VTPs	Virtual Trading Points
WG	Working Group
WI	Wobbe Index

COUNTRY CODES (ISO)

AL	Albania	LU	Luxembourg
AT	Austria	LV	Latvia
AZ	Azerbaijan	LY	Libya
BA	Bosnia and Herzegovina	MA	Morocco
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CY	Cyprus	NO	Norway
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EE	Estonia	RU	Russia
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HR	Croatia	TN	Tunisia
HU	Hungary	TR	Turkey
IE	Ireland	UA	Ukraine
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LT	Lithuania		

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