entsog
european network
of transmission system operators
for gas

Picture courtesy of DESFA

GAS REGIONAL INVESTMENT PLAN SOUTHERN CORRIDOR

Based on ENTSOG's TYNDP 2018

ANNEX A

Country Profiles

SOUTHERN CORRIDOR

TABLE OF CONTENTS

AUSTRIA

Existing Gas Infrastructure

Number of TSOs	2
Total length of transmission network(s)	approx. 1,700 km
Total compressor power	626 MW
Inter-TSO connections where capacity is marketed (incl. adjacent operators)	
Gas Connect Austria GmbH	— Baumgarten GCA/eustream (SK) — Baumgarten WAG/eustream (SK) — Mosonmagyaróvár/FGSZ (HU) — Murfeld/Plinovodi (SI) — Petrzalka/eustream (SK) — Überackern ABG/bayernets (DE) — Überackern ABG/Open Grid Europe (DE) — Überackern SUDAL/bayernets (DE) — Überackern SUDAL/Open Grid Europe (DE) — Oberkappel/Open Grid Europe (DE) — Oberkappel/GRTgaz Deutschland (DE)
Trans Austria Gasleitung GmbH	— Baumgarten/eustream (SK) — Tarvisio-Arnoldstein/Snam Rete Gas (IT)
Storage facilities on Austrian territory	
	— Schönkirchen/Reyersdorf — Tallesbrunn — Puchkirchen/Haag — Aigelsbrunn — Nussdorf/Zagling — Haidach 5 — Haidach — 7 Fields
Production facilities	
All production facilities are connected to the DSO network.	— 1 virtual entry point from OMV Austria Exploration & Production — 1 virtual entry point from RAG
Directly connected customers	
Gas Connect Austria GmbH	— Total: 1 — Gas-fired power plants: 0

Physical TSO-DSO connections and total number of DSOs in the country	
Physical TSO-DSO connections	— Gas Connect Austria GmbH: 7 — Trans Austria Gasleitung GmbH: 9
Total number of DSOs	— 21
Physical hubs and Virtual Trading Points	— CEGH
Balancing zones	— Market Area East — Market Area Tyrol in connection with Market Area Vorarlberg
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 90,681 GWh **2017:** 95,163 GWh **2016:** 87,966 GWh **2015:** 84,585 GWh

Network Overview

Austria is a transit country for natural gas to Europe. The recipients are Germany and Western Europe connected via the Interconnection Points Oberkappel, Überackern ABG and SUDAL, Italy, Slovenia and Croatia (supplied via the Interconnection Point Arnoldstein, as well as Murfeld) and Hungary (connected via the Interconnection Point Mosonmagyaróvár).

Gas Connect Austria GmbH

Website	www.gasconnect.at
Current Publications	The Network Development Plan of GCA is published in the course of the Coordinated Network Development Plan (10 Years Planning Horizon) on the Website of the Austrian Market Area Manager
Total length of the transmission network	564 km
Total compressor power	146 MW
Unbundling model	ITO

Trans Austria Gasleitung GmbH

Website	www.taggmbh.at
Current Publications	The Network Development Plan of Trans Austria Gasleitung GmbH is published in the course of the Coordinated Network Development Plan (10 Years Planning Horizon) on the Website of the Austrian Market Area Manager
Total length of the transmission network (this excludes distribution)	1,140 km
Total compressor power	480 MW
Total transported energy (in gas)	**2015:** 345,133 GWh/a **2016:** 337,852 GWh/a **2017:** 348,460 GWh/a **2018:** 331,605 GWh/a
Ratio of transported energy over demand of the national market (2018)	3,65
Unbundling model	ITO

BULGARIA

Existing Gas Infrastructure

Number of TSOs	1
Total length of transmission network(s)	2,788 km
Total compressor power	Transmission: 319 MW Storage: 9 MW
Inter-TSO connections where capacity is marketed (incl. adjacent operators)	
Bulgartransgaz	— Negru Voda I & II, III/Transgaz (RO) — Kulata/Sidirokastron/DESFA (GR) — Malkoclar/BOTAS (TK) — Zidilovo/GA-MA (MK) — Ruse/Transgaz (RO)
LNG terminals	
	— N/A
Storage facilities	
The underground gas storage facility, which is owned and operated by Bulgartransgaz is connected to Bulgartransgaz network	— Chiren UGS
Production facilities	
Production facilities in Bulgaria are connected to Bulgartransgaz network in the following entry points:	— GMS Galata — GMS Dolni Dabnik
Directly connected customers	
Bulgartransgaz	— Total: 230 — Gas-fired power plants – Number: 1

Distribution systems SOs and total number of DSOs in the country	
Bulgartransgaz	— Number of physical TS-DS connections: 104 — Number of DSOs: 24
Physical hubs and Virtual Trading Points	— N/A
Number of balancing zones	2
Balancing zones	— Market Area East — Market Area Tyrol in connection with Market Area Vorarlberg
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 31,663 GWh **2017:** 33,285 GWh **2016:** 32,705 GWh

Network Overview

Bulgartransgaz EAD Gas infrastructure on the territory of the Republic of Bulgaria consists of the National gas transmission network supplying natural gas to most Bulgarian users, the Gas transmission network for transit transmission ensuring mainly natural gas transport to Turkey, Greece and North Macedonia of 2,788 km total length and the Underground gas storage in Chiren (UGS Chiren), directly connected to the national gas transmission network.

National gas transmission network

The National gas transmission network (NGTN) is gas transmission network the main purpose of which is natural gas transmission to consumers in Bulgaria connected thereto. The NGTN is comprising about 1,835 km main gas pipelines and high-pressure gas pipeline branches, three compressor stations – CS Kardam-1, CS Valchi Dol and CS Polski Senovets with total installed capacity of 49 MW. The NGTN comprises also of gas regulation stations, gas metering stations, electrochemical protection system, pigging facilities, communications system, information system and other ancillary facilities. Its technical transmission capacity amounts to 7.4 bcm/y and the maximum working pressure is 54 bar.

Gas transmission network for transit transmission

The Gas transmission network for transit transmission (GTNTT) is gas transmission network the main purpose of which is natural gas transit transmission, used also for gas transmission to customers in Bulgaria connected thereto, comprising of 953 km gas pipelines and six compressor stations – CS Kardam-2, CS Provadia, CS Lozenets, CS Strandzha, CS Ihtiman and CS Petrich, with total installed capacity of 270 MW, electrochemical protection system, pigging facilities, communication system, information system and other ancillary facilities. It mainly transports natural gas quantities from an entry point at the Bulgarian-Romanian border to the exit points to Turkey, Greece and North Macedonia. Its technical capacity for natural gas transit transmission in total to the three directions amounts to 17.8 bcm/y and the maximum working pressure is 54 bar. Bulgartransgaz EAD had constructed and run in commercial operation two reverse flow stations, metering natural gas quantities between the transit and the national gas transmission networks, GMS Ihtiman and GMS Lozenets and by using them the Operator can transport natural gas quantities to network users of both networks.

Underground Gas Storage (UGS) Chiren

The Underground Gas Storage Chiren was built near Chiren village based on the already depleted gas condensate field. It is equipped with specialized underground and above-ground facilities, required to ensure natural gas storage. Chiren UGS has 24 exploitation wells and a compressor station of approximately 9 MW total installed capacity. The present storage capacity can provide storage of up to 5,813,500 MWh/d natural gas. The withdrawal and injection capacity, according to the formation pressures and other factors, is between 5,500 MWh/d (minimum) up to 40,377 MWh/d (maximum) for withdrawal.

Bulgartransgaz

BULGARTRANSGAZ

Website	http://www.bulgartransgaz.bg/en
Current Publications	N/A
Total length of the transmission network	2,788 km
Total compressor power	Transmission: 319 MW Storage: 10 MW
Total transported energy (in gas)	186,398 GWh
Ratio of transported energy over demand of the national market (2018)	5.27
Unbundling model	ITO

CROATIA

Existing Gas Infrastructure

Number of TSOs	1
Total length of transmission network(s)	2,693 km
Total compressor power	–
Inter-TSO connections where capacity is marketed (incl. adjacent operators)	
PLINACRO	– Rogatec/Plinovodi (SLO) – Donji Miholjac (Dravaszerdehaly)/FGSZ (HU)
LNG terminals	
	–
Storage facilities	
UGS OKOLI facility is connected to PLINACRO's 50 bar network	– UGS OKOLI/Podzemno skladište plina d.o.o.
Production facilities	
PLINACRO	– CPS Molve (Durdevac)/INA d.d. – CPS Etan (Ivanic Grad)/INA d.d. – offshore platforms/Terminal Pula/INAGIP d.o.o. – Ferdinandovac/INA d.d. – Gola/INA d.d. – Hampovica/INA d.d.

Directly connected customers	
PLINACRO	— Total: 23 — Gas-fired power plants: 5
Distribution systems SOs and total number of DSOs in the country	
PLINACRO	— Number of physical TS-DS connections: 166 — Number of DSOs: 37
Physical hubs and Virtual Trading Points	1
Number of balancing zones	1
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 25,609 GWh **2017:** 28,129 GWh **2016:** 24,381 GWh **2015:** 22,992 GWh **2014:** 22,382 GWh

Network Overview

Plinacro owns and operates 2,693 km of high-pressure gas pipelines, **1,741 km of which is 50-bar** and **952 km is 75-bar system**, 6 entry measuring stations, 157 exit measuring-reduction stations with 166 TS-DS connections and a state-of-the-art National Dispatching Centre, a centre of remote supervision and managing the entire gas transmission system. Croatian gas transmission system operated by Plinacro has two interconnection points with neighboring countries, interconnection point Rogatec (Slovenia) and interconnection point Donji Miholjac/Dravaszerdahely (Hungary). A bi-directional gas flow, enabling gas flow from Croatia to Slovenia, was established in 2018, at the interconnection point Rogatec/Slovenia. The first compressor station on the Croatian gas transmission system will be commissioned by the end of 2019. This compressor station will enable gas flow from Croatia to Hungary at the existing interconnection point Donji Miholjac/Dravaszerdahely, transit of gas between the two existing interconnection points and compression of gas from 50-bar gas transmission system into 75-bar gas transmission system. The compressor station will consist of three reciprocating compressor units driven by gas engines two of which will be working units and one a spare unit. Total compressor power will be 4.2 MW.

Plinacro is preparing construction of gas pipeline Omišalj-Zlobin DN 800/100 bar which will connect planned LNG terminal on the island of Krk with existing 75 bar gas transmission system. Commissioning of the gas pipeline Omišalj-Zlobin is planned for the end of 2020.

In 2018, 29,541 GWh of gas was taken over into the transmission system, decreased by 8.68 % in comparison to 2017. Out of the totally delivered gas quantities the share of gas produced in Croatia was 35 %, the share of gas from import was 55 %, while the share of gas taken over from UGS Okoli was 10 %. Gas entry from production fields has increased by 12.11 %, while the imported gas was decreased by 25.95 %.

In 2018, 25,609 GWh of gas was delivered from the gas transmission system to the final customers and DSO which a decrease by 8.96 % compared to 2017, while 3,932 GWh was delivered to the UGS Okoli which is na decrease of 6.63 % compared to 2017. Technical capacities at entries and exits from the transmission system provided safe and secure gas supply.

PLINACRO

Website	www.plinacro.hr
Current Publications	TYNDP 2018-2027
Total length of the transmission network	2,693 km
Total compressor power	—
Total transported energy (in gas)	29,541 GWh
Ratio of transported energy over demand of the national market (2018)	1.15
Unbundling model	Ownership unbundling (OU)

GREECE

Existing Gas Infrastructure

Number of TSOs	1
Total length of transmission network(s)	1,464 km
Total compressor power	13 MW
Inter-TSO connections where capacity is marketed (incl. adjacent operators)	
DESFA	— Kula/Sidirokastron – Bulgartransgaz (BG) — Kipi – Botas (TK)
LNG terminals	
	— Revithoussa
Storage facilities	
	— N/A
Production facilities	
	— N/A

Directly connected customers	
	— Total: 41 — Of which Gas-fired power plants: 12
Distribution systems SOs and total number of DSOs in the country	
	— Number of physical TS-DS connections: 23 — Number of DSOs: 3
Physical hubs and Virtual Trading Points	1
Number of balancing zones	1
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 50,426 GWh **2017:** 52,134 GWh **2016:** 43,705 GWh **2015:** 32,801 GWh

Network Overview

The Greek gas transmission system is composed of a north-south backbone linking the two main import points: the IP Kula/Sidirokastro at the GR/BG border and the LNG terminal on the island of Revythoussa, near Athens. An eastwards branch links this backbone to the third import point, the IP Kipi at the GR/TK border. Several more branches supply gas to industrial or urban areas and to individual customers, mainly power producers.

The second upgrade of the LNG terminal was finalized in 2018 by increasing the storage capacity up to 225.000 m³ and the send out rate by 40 %. Greece intends to upgrade its role in the Regional gas market due to several interconnection projects that will link the country to its neighbours, most of them sponsored by third parties, like TAP, IGB or that will increase the flexibility of its transmission network like new import points or the South Kavala UGS in Northern Greece.

In 2018 gas was imported mainly from the Sidirokastro IP (66 %), LNG followed with 21 % while the remaining 14 % was imported from Kipi.

Note: In 2019 the LNG share in the supply mix exceeded 50 %.

DESFA S.A.

DESFA
Hellenic Gas Transmission System Operator S.A.

Website	www.desfa.gr
Current Publications	— 10-year Network Development Study (mandatory) 2020–2029 — 10-year Network Development Plan (mandatory) 2017–2026 (the new Development Plan for 2020–2029 is under approval by the Regulator, as of Nov.2019)
Total length of the transmission network	1,464 km
Total compressor power	13 MW
Total transported energy (in gas)	50,426 GWh
Ratio of transported energy over demand of the national market (2018)	1.0
Unbundling model	Ownership Unbundling

HUNGARY

Existing Gas Infrastructure

Number of TSOs	2
Total length of transmission network(s)	5,873 km
Total compressor power	243 MW
Inter-TSO connections where capacity is marketed (incl. adjacent operators)	
FGSZ	— Beregdaróc 1400 (UA>HU)/Ukrtransgas (UA) — Beregdaróc 800 (HU>UA)/Ukrtransgas (UA) — Mosonmagyaróvár (AT>HU)/Gas Connect Austria (AT) — Kiskundorozsma (HU>RS)/Srbijagas (RS) — Csanádpalota (HU>RO)/Transgaz (RO) — Csanádpalota (RO>HU)/Transgaz (RO) — Drávaszerdahely (HU>CR)/Plinacro (HR) — Drávaszerdahely (CR>HU)/Plinacro (HR) — Vecsés 4 (MGT>FGSZ)/MGT — Vecsés 4 (FGSZ>MGT/FGSZ
FGSZ	— Balassagyarmat (HU>SK)/eustream a.s (SK) — Balassagyarmat (SK>HU)/eustream a.s (SK)
LNG terminals	
	— N/A
Storage facilities	
FGSZ	Unified storage entry/exit point, which contains the following storage facilities: — Zsana/Magyar Földgáztároló Zrt. — Hajdúszoboszló/Magyar Földgáztároló Zrt. — Pusztaederics/Magyar Földgáztároló Zrt. — Kardoskút/Magyar Földgáztároló Zrt. Strategic and commercial storage: — Algyő III Szőreg-I/MMBF Zrt.

Production facilities	
FGSZ	— Algyő III "0" point/MOL Nyrt. — Babócsa "0" point/MOL Nyrt. — Endrőd "0" point/MOL Nyrt. — Hajdúszoboszló "0" point/MOL Nyrt. — Karcag II (Bucsa) "0" point/MOL Nyrt. — Pusztaederics "0" point/MOL Nyrt. — Szank "0" point/MOL Nyrt. — Kardoskút "Regional 6 bar"/MOL Nyrt. — Kardoskút "Regional 15 bar"/MOL Nyrt. — Kenderes II inert "0" point/MOL Nyrt. — Babócsa Regional/MOL Nyrt. — Zsámbok "0" point/MOL Nyrt. — Berekfürdő "0" point/MOL Nyrt. — Tiszavasvári II "0" point/Folyópart — Edde "0" point/MOL Nyrt. — Sáránd "0" point/OGD Kft.
Directly connected customers	
FGSZ	— Total: 38 — Gas-fired power plants — Number: 13
Distribution systems SOs and total number of DSOs in the country	
FGSZ	— Number of physical TS-DS connections: 357 — Number of DSOs: 10
Physical hubs and Virtual Trading Points	— MGP/FGSZ
Number of balancing zones	1
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 104,886 GWh **2017:** 109,450 GWh **2016:** 102,334 GWh **2015:** 95,012 GWh **2014:** 86,772 GWh **2013:** 97,166 GWh **2012:** 111,950 GWh **2011:** 121,684 GWh **2010:** 131,233 GWh

Network Overview

The natural gas transmission network consists of "0" points, compressor stations, gas transmission nodes, measuring stations, high-pressure transmission pipelines and gas delivery stations directly supplying the regional natural gas distribution companies and industrial consumers.

The natural gas coming from imported gas sources, domestic productions and from underground gas storage facilities is injected into the transmission network at the entry points.

The natural gas received at the entry points is forwarded through the Company's transmission network to the connected system operators and the direct industrial consumers. The transmission network is 5,873 km long and consists of steel pipes with a size between DN100 and DN1400, mostly with a design pressure of 63 bar (sometimes 75 bar).

In the compressor stations built into the transmission network are operating gas turbine-propelled centrifugal compressors, which have the function of increasing the system's capacity by elevating the gas pressure so that the gas can be transported through the pipeline to the consumers.

The allocation of the natural gas transported through the pipeline system takes place at the gas delivery stations. These facilities continuously transport and transfer the gas to the connected system operators and the direct industrial consumers under monitored conditions.

The Company measures the amount of the natural gas and knows the quality of the natural gas at every input and output point of the transmission system. The quality of the delivered gas is measured with more than 600 measurement systems at the gas delivery stations, input points and international measurement stations for the gas suppliers, industrial and power plant consumers. We monitor the quality of the natural gas with continuously working gas chromatographs at the entry points, high capacity delivery and node points, where gases of different quality can mix.

Network Overview (continued)

There is a complex telemechanic remote supervision system (SCADA) on the natural gas transmission network supporting the execution of operation and system operation activities.

The Company operates a cathodic protection system covering its entire steel transmission pipeline network.
There are two TSO in Hungary: FGSZ Ltd. and Magyar Gáz Tranzit Zrt.

FGSZ Ltd.
(Natural Gas Transmission Company Limited by Shares)

Website	www.fgsz.hu
Current Publications	10-year Network Development Plan (voluntary)
Total length of the transmission network	5,782 km
Total compressor power	234 MW
Total transported energy (in gas)	223,355 GWh
Ratio of transported energy over demand of the national market (2018)	2.13
Unbundling model	ITO

Magyar Gáz Tranzit Zrt.

Website	www.gaztranzit.hu
Current Publications	–
Total length of the transmission network (this excludes distribution)	92 km
Total compressor power	9 MW
Total transported energy (in gas)	104 GWh
Ratio of transported energy over demand of the national market (2018)	n.d
Unbundling model	OU

ITALY

Existing Gas Infrastructure

Number of TSOs	9
Total length of transmission network(s) (31/12/2018)	34,876 km
Total compressor power (31/12/2018)	961 MW
Inter-TSO connections where capacity is marketed (incl. adjacent operators)	
Snam Rete Gas	— Passo Gries/FluxSwiss (CH) — Passo Gries/Swissgas (CH) — Tarvisio/TAG (AT) — Gorizia/Plinovodi (SI) — Gela/Greenstream (LY) — Mazara del Vallo/TMPC (TN) — Bizzarone/DSO (CH) — San Marino/DSO (SM)
LNG terminals	
Snam Rete Gas	— Panigaglia/GNL Italia — Cavarzere/Adriatic LNG (the related entry point is linked to Infrastrutture Trasporto Gas network and Snam Rete Gas markets the entry point capacity) — Livorno/OLT Offshore LNG Toscana

Storage facilities (Interconnected to the national network through two virtual entry-exit points: Stogit hub and Edison Stoccaggio hub)	
Stogit hub	— Brugherio/Stogit (100 %) — Bordolano/Stogit (100 %) — Cortemaggiore/Stogit (100 %) — Fiume Treste/Stogit (100 %) — Minerbio/Stogit (100 %) — Ripalta/Stogit (100 %) — Sabbioncello/Stogit (100 %) — Sergnano/Stogit (100 %) — Settala/Stogit (100 %)
Edison Stoccaggio hub	— Cellino/Edison Stoccaggio (100 %) — Collalto/Edison Stoccaggio (100 %) — San Potito e Cotignola/Edison Stoccaggio (90 %) e Blugas Infrastrutture (10 %)
Ital Gas Storage Spa	— Cornegliano Laudense/Ital Gas Storage (100 %)
Production facilities (interconnected to the national network)	
	— Cupello — Casteggio — Caviaga — Fornovo — Ovanengo — Piadena Ovest — Pontetidone — Quarto — Rivolta d'Adda — Soresina — Trecate — Casalborsetti — Collalto — Medicina — Montenevoso — Muzza — Nervesa della Battaglia — Ravenna Mare — Ravenna Mare Lido Adriano — Santerno — Spilamberto B.P. — Vittorio V. (S. Antonio) — Rubicone — Falconara — Fano — Capparuccia — Carassai — Cellino — Grottammare — Montecosaro — Pineto — Bagnacavallo — Guardiaperticara — S. Giorgio M. — San Benedetto T. — Settefinestre/Passatempo — Fonte Filippo — Larino — Ortona — Poggiofiorito — Reggente — S. Stefano M. — Candela — Roseto/T. Vulgano — Torrente Tona — Calderasi/Monteverdese

Production facilities (continued)	
	— Metaponto — Monte Alpi — Pisticci A.P./B.P. — Sinni (Policoro) — Crotone — Hera Lacinia — Bronte — Comiso — Gagliano — Mazara/Lippone — Noto
Directly connected customers	
Snam Rete Gas	— Total number of physical connections to active customers: 3,156 — Gas-fired power plants — Number: 100 plants
Distribution systems SOs and total number of DSOs in the country	
Snam Rete Gas	— Number of physical active TSO-DSO connections: 3,926 — Number of DSOs: 211 (Source: AEEG Annual Report, 2018; this may include DSOs not directly connected to Snam Rete Gas' network)
Physical hubs and Virtual Trading Points	— Punto di Scambio Virtuale (PSV)/Snam Rete Gas
Number of balancing zones	1
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 768,279 GWh **2017:** 752,262 GWh **2016:** 749,756 GWh **2015:** 713,026 GWh **2014:** 654,559 GWh **2013:** 740,833 GWh **2012:** 792,005 GWh **2011:** 823,829 GWh **2010:** 879,444 GWh **2009:** 825,758 GWh

Network Overview

Since more than seventy years **Snam Rete Gas** has been designing, building and managing the infrastructure for the transmission of natural gas, ensuring Italy stable supplies through a continuous improvement of the gas system. The pipeline network, which has been realized in respect of the environment and landscapes, extends for more than 32,500 km across most of the country. This integrated network is operated by eight local districts that oversee and control the activities of the 48 maintenance centres and a dispatching centre coordinating the 11 compressor stations.

Snam Rete Gas takes in charge the natural gas at the delivery points which are connected to the import lines from Russia, Northern Europe and North Africa, with regasification plants as well as with production and storage sites throughout Italy. The gas is then transported and made available, based on the request of the shippers, at delivery points connected to local distribution networks, large industrial users and power stations. Access to the transport service is subject to regulation, like also tariffs, which are defined on the basis of clear and transparent criteria established by the Italian Regulatory Authority for Energy, Networks and Environment (ARERA).

The **Infrastrutture Trasporto Gas** transportation system consists of the pipeline "Cavarzere - Minerbio" which runs for about 84 km, from Cavarzere (VE) up to the interconnection with Snam Rete Gas near Minerbio (BO). The pipeline allows the interconnection of the offshore regasification terminal located off the coast of Porto Viro (province of Rovigo) with the Minerbio hub, thanks to a 36" pipeline, with a pressure of 75 bar and a transportation capacity of 9.6 billion Smc, corresponding to a maximum daily capacity of 26.4 MSmc/day. The infrastructure was completed in February 2008, and the commercial transmission of gas, that comes mainly from Qatar, began in September 2009.

Società Gasdotti Italia network is composed by around 1,600 km of pipelines located mainly in central and southern Italy. The network connects production sites, storage areas, regional distributors and power generation facilities yearly transporting around 1 Bsm^3. SGI grid comprises 9 interconnections with national transport network of Snam Rete Gas, 11 entry points interconnected with domestic gas production and 2 points linked to underground storage sites (Cellino e Collalto).

Snam Rete Gas and SGI have signed an agreement for the constitution of a new TSO (ENURA S.p.A.) participated by both companies with the task of building and operating the gas transport network for the methanization of the Sardinia region.

Snam Rete Gas S.p.A. (Societa per Azioni – Joint Stock Company)

Website	http://www.snam.it
Current Publications	Development Plan of SRG Network – Ten year basis (mandatory)
Total length of the transmission network (this excludes distribution)	32,586 km
Total compressor power	961 MW
Total transported energy on national networks in 2018 (in gas)	769,853 GWh
Ratio of transported energy over demand of the national market (2018)	1
Unbundling model	Ownership unbundling

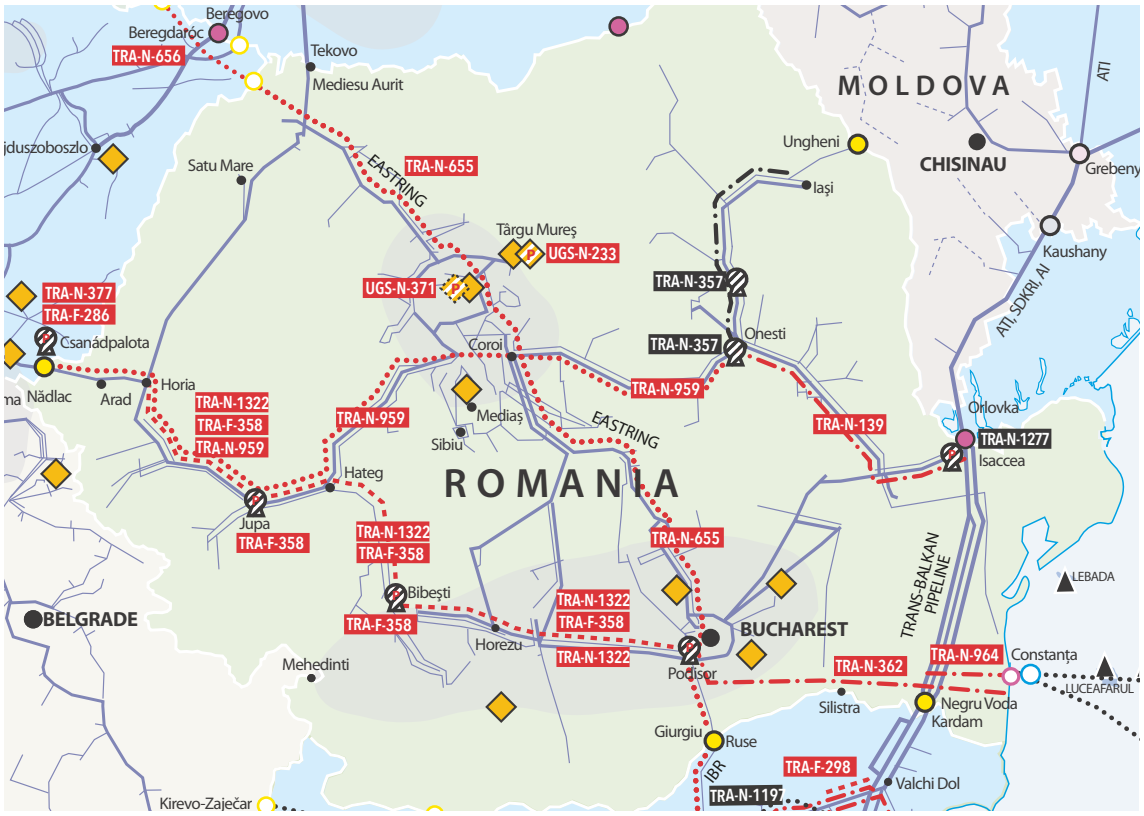
Società Gasdotti Italia S.P.A. (Societa per Azioni – Joint Stock Company)

Website	http://www.gasdottitalia.it/it
Total length of the transmission network (this excludes distribution)	1,593 km

Infrastrutture Trasporto Gas S.P.A. (Societa per Azioni – Joint Stock Company)

Website	http://www.snam.it/it/trasporto/Processi_Online/ReteSnamReteGas/informazioni/rete-srg/index_rete.html
Total length of the transmission network	83 km

ROMANIA



Existing Gas Infrastructure

Number of TSOs	1
Total length of transmission network(s)	13,380 km
Total compressor power	28,94 MW
Inter-TSO connections where capacity is marketed (incl. upstream operators)	
SNTGN Transgaz SA	— Csanadpalota/FGSZ HU — Negru Voda 1/Bulgartransgaz (BG) — Negru Voda 2/Bulgartransgaz (BG) — Negru Voda 3/Bulgartransgaz (BG) — Mediesul Aurit –Isaccea Import/Ukrtransgaz (UA) — Isaccea 1/Uktransgaz (UA) — Isaccea 2/Uktransgaz (UA) — Isaccea 3/Uktransgaz (UA) — Ungheni/Vestmoldotransgaz — Ruse-Giurgiu/Bulgartransgaz (BG)
LNG terminals	
	— N/A
Storage facilities	
SNTGN Transgaz SA is interconnected to storage facilities which are owned and operated by SNGN Romgaz SA or DEPOMURES SA.	— Underground Storage Sărmășel/Sărmășel (RO)/ SNGN Romgaz SA-Depogaz — Underground Storage Bălăceanca/Bălăceanca (RO)/ SNGN Romgaz SA-Depogaz — Underground Storage Bilciurești (Butimanu)/ Bilciurești (Butimanu) (RO)/SNGN Romgaz SA-Depogaz — Underground Storage Ghercești/Ghercești (RO)/ SNGN Romgaz SA-Depogaz

Storage facilities (continued)	
SNTGN Transgaz SA is interconnected to storage facilities which are owned and operated by SNGN Romgaz SA or DEPOMURES SA.	— Underground Storage Urziceni/Urziceni (RO)/ SNGN Romgaz SA-Depogaz — Underground Storage Tg. Mures/Tg. Mures (RO)/ DEPOMURES SA
Production facilities	
SNTGN Transgaz SA	— 77 entry points/Romanian territory/SNGN Romgaz SA — 38 entry points/Romanian territory/OMV Petrom SA — 12 entry points/Romanian territory/Amromco Energy SA — 1 entry point/Romanian territory/SC Raffles Energy SRL — 1 entry point/Romanian territory/Lotus Petrol SRL — 1 entry point/Romanian territory/ SC Hunt Oil Company Romania SA — 1 entry point/Romanian territory/ SC Stratum Energy Romania LLC — 1 entry point/Romanian territory/ SC Serinus Energy Romania SA — 1 entry point/Romanian territory/Foraj Sonde SA
Directly connected customers	
SNTGN Transgaz SA	— Total: 223 — Gas-fired power plants: 15
Distribution systems SOs and total number of DSOs in the country	
SNTGN Transgaz SA	— Number of physical TS-DS connections: 889 — Number of DSOs: 35
Physical hubs and Virtual Trading Points	— N/A
Number of balancing zones	1
Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 129,535 GWh **2017:** 129,861 GWh **2016:** 124,110 GWh

Network Overview

Gas transmission Operator "TRANSGAZ" S.A. is the tehnical operator of the Romanian gas transmission system. TRANSGAZ S.A. operates the system based on the licence no. 1933/2013 which is valid until 2032.

The transmission system in Romania consists of pipelines with the length of 13,380 km (out of which 370 km are transit pipelines) with diameters between 50 mm and 1,200 mm. The operating pressure varies between 6 bar and 40 bar, whereas the transit is carried out at 63 bar. The required gas pressure in the pipelines is ensured through 3 compressor stations having a total installed power of 28.94 MW. From the transmission system the gas is further supplied to the distribution systems, underground storage facilities and the facilities of directly connected customers.

The existing transmission system is very complex, with multiple operational interconnections, but it requires upgrading in term of replacing old pipelines and increasing transmission capacities.

Besides the inter-TSO connections mentioned above, development on the Romanian territory of two gas transmission corridors (BRUA corridor phase 1 and phase 2, in a first stage, and a central one BRUA phase 3, in a second step, in case the exploitation in the Black Sea exceeds the current estimates) is intended which will provide the link between Black Sea gas reserves and Central Western European markets, while ensuring the backbone of the Romanian Gas Transmission System.

Moreover, Transgaz has in view to create new transmission corridors and to extend the transmission capacities in the interconnection points with neighbouring countries.

SNTGN Transgaz SA

Website	www.transgaz.ro
Current Publications	10 Years Network Development Plan 2016–2025 10 Years Network Development Plan 2017–2026 10 Years Network Development Plan 2018–2027 10 Years Network Development Plan 2019–2028 – (to be approved)
Total length of the transmission network (this excludes distribution)	13,380 km
Total compressor power	28.94 MW
Total transported energy (in gas)	139,165 GWh
Ratio of transported energy over demand of the national market (2018)	1.07
Unbundling model	ISO

SLOVAKIA

Existing Gas Infrastructure

Number of TSOs	1
Total length of transmission network(s) (30.9.2019)	2,332 km
Total compressor power (30.9.2019)	541 MW
Inter-TSO connections where capactiy is marketed (incl. upstream operators)	
eustream, a.s.	– Veľké Kapušany and Budince – Ukrtransgaz (UA)/eustream (SK) – Baumgarten – eustream (SK)/Gas Connect Austria, Trans Austria Gasleitung (AT) – Lanžhot – Eustream (SK)/Net4Gas (CZ) – Veľké Zlievce – Eustream (SK)/FGSZ (HU)
LNG terminals	
	– N/A
Storage facilities	
Eustream	– NAFTA, a.s. (NAFTA is also connected to the DSO) – POZAGAS, a.s (not directly connected to the TSO)
Production facilities	
Eustream	– NAFTA, a.s. (NAFTA is also connected to the DSO)
Directly connected customers	
Eustream	– Total:0 – Gas fired power plants: –

Distribution systems SOs and total number of DSOs in the country	
eustream, a.s.	— Number of physical TSO-DSO connections: 9 — Number of DSOs: 1
Physical hubs and Virtual Trading Points	1
Number of balancing zones	1
Demand	
Historical annual gas demand on the national market (final customers)	**2018:** 25,609 GWh **2017:** 28,129 GWh **2016:** 24,381 GWh **2015**: 22,992 GWh **2014:** 22,382 GWh

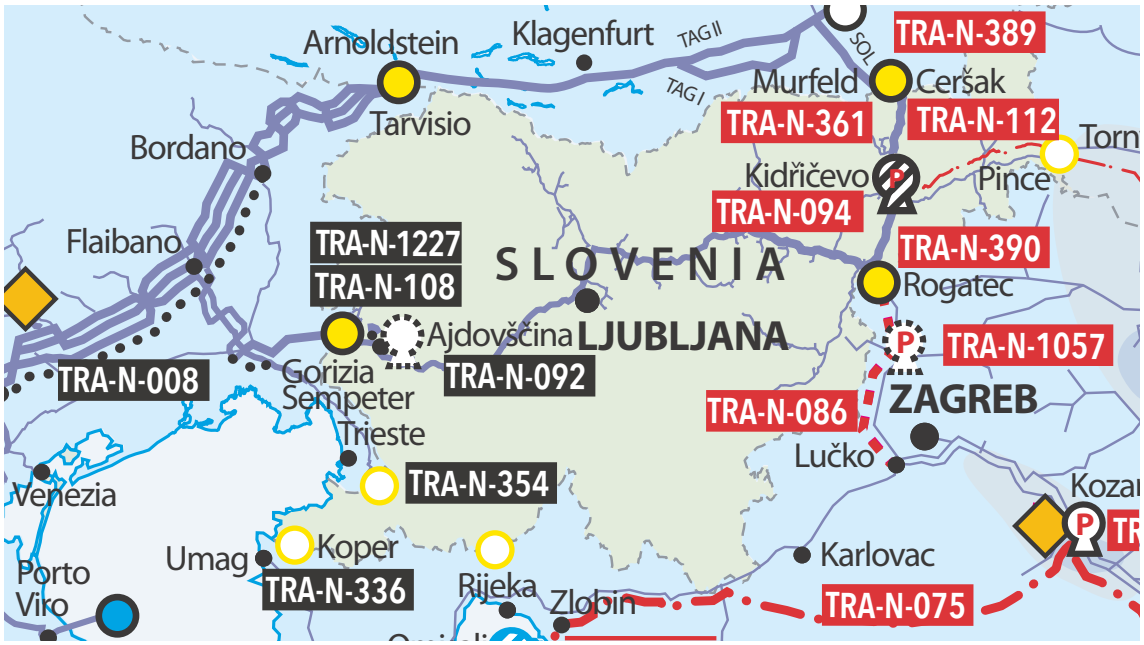
Network Overview

Since 1972, Eustream has secured the transmission of over 2.5 trillion cubic meters of natural gas across the territory of the Slovak republic, successfully continuing more than 160 years long tradition of the Slovak gas industry. The annual capacity of the transmission system operated by Eustream is 80 billion cubic meters, which equals roughly 16 times the overall domestic gas consumption of the Slovak Republic. This demonstrates the importance of international gas transit in Eustream's operations. Eustream in the past has responded to the gas crisis situations by improving interconnections with neighbouring countries. The EU has co-funded several Eustream's projects (SK-HU interconnection, PL-SK interconnector, Eastring) that increase security of supply not only in Slovakia but in the whole region. These projects include Slovakia-Hungarian Interconnection, increase of reverse flow capacities at Lanžhot, Poland – Slovakia interconnector, increase of the capacities towards Ukraine. Eustream continuously invests into modernization and upgrade of the infrastructure and doing its utmost to reduce the environmental impact of its activities. Eustream allows access to the gas transmission network and offers its customers a wide range of transmission services on a transparent and non-discriminatory basis. The access regime is in full compliance with existing EU and national legislation and gas industry standards.

Eustream, a.s. (Joint stock company)

Website	www.eustream.sk
Current Publications	annual reports, national development plans
Total length of the transmission network	2,332 km
Total compressor power	541 MW
Total transported energy 2017 (in gas)	680.52 TWh
Ration of transported energy over demand on national market (2017) (in gas)	13.5
Unbundling model	ITO

SLOVENIA



Existing Gas Infrastructure

Number of TSOs	1
Total length of transmission network(s)	1,174 km
Total compressor power	19.5 MW
Inter-TSO connections where capacity is marketed (incl. upstream operators)	
Plinovodi d.o.o.	— Murfeld/Ceršak - GAS CONNECT AUSTRIA (AT) — Rogatec - Plinacro (HR) — Gorizia/Šempeter - Snam Rete Gas (IT)
LNG terminals	
	— N/A
Storage facilities	
Interconnected DSOs	— N/A
Production facilities	
Interconnected DSs	— N/A
Directly connected customers	
Plinovodi d.o.o.	— Total: 151 — Gas-fired power plants: 2
Distribution systems SOs and total number of DSOs in the country	
Plinovodi d.o.o.	— Number of physical TS-DS connections: 108 — Number of DSOs: 13
Physical hubs and Virtual Trading Points	— From 1.10.2015 a Virtual Trading Point (VTP-SI) is operating in Slovenia.
Number of balancing zones	1

Demand	
Historical annual gas demand of the national market (final customers)	**2018:** 9,437 GWh **2017:** 9,559 GWh **2016:** 9,257 GWh **2015:** 8,837 GWh **2014:** 8,127 GWh **2013:** 8,864 GWh

Network Overview

Slovenian gas transmission system is connected through 3 interconnection points to the Austrian, Italian and Croatian gas transmission system. There is no interconnection between Slovenia and Hungary yet, but it is planned.

Based on the importance of gas infrastructure projects, from the viewpoint of the development of the national gas market, harmonization with international projects and safety updates, the TSO Plinovodi divides planned gas infrastructure into 3 groups:

— The first group includes projects intended to increase operational reliability/security, these are mostly "loops" and adjustments of the gas transmission system due to settlement and other circumstances.
— The second group includes new construction, connecting the gas transmission system with new municipalities and other gas consumers, also including projects that are intended to locally increase the capacity of the transmission system and the security of supply.
— The third group are projects for cross-border gas transmission with transmission systems of neighbouring countries, which are included in international projects for diversified supply of the European gas market (including 4 Projects of Common Interest – PCIs – of the EC).

Plinovodi d.o.o.

Website	http://www.plinovodi.si
Current Publications	N/A
Total length of the transmission network (this excludes distribution)	1,174 km
Total compressor power	19.5 MW
Total transported energy (in gas)	20,066 GWh/year 2015
Ratio of transported energy over demand of the national market (2018)	2.26
Unbundling model	ITO

ENTSOG AISBL
Avenue de Cortenbergh 100 | 1000 Brussels, Belgium
Tel. +32 2 894 51 00

info@entsog.eu | www.entsog.eu