entsog
european network
of transmission system operators
for gas

GAS REGIONAL INVESTMENT PLAN
2017–2026

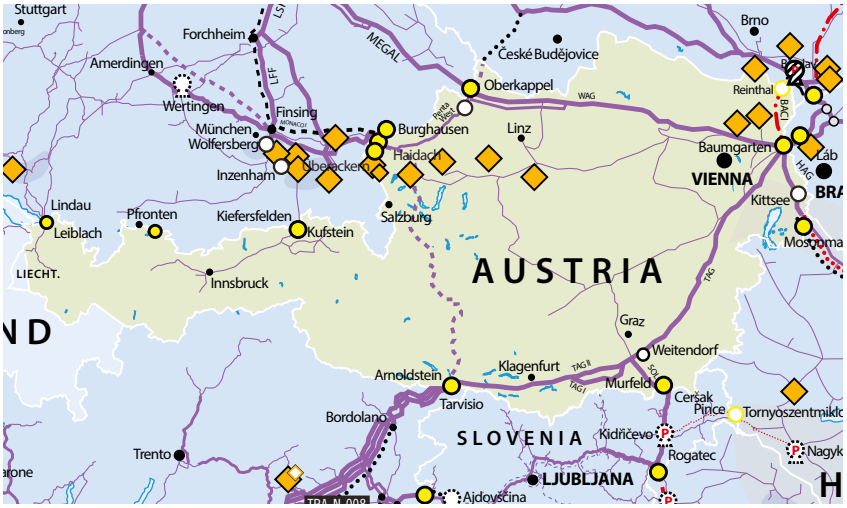
Southern Corridor

GRIP

ANNEX A: COUNTRY PROFILES

GAS CONNECT AUSTRIA
TAG Trans Austria Gasleitung
BULGARTRANSGAZ
plinacro
DESFA
Hellenic Gas Transmission System Operator S.A.
FGSZ LTD.
SNAM RETE GAS
TRANSGAZ
MAGISTRALA ENERGIEI
eustream
SLOVAK GAS TSO
Plinovodi
Connected through energy

Austria



EXISTING GAS INFRASTRUCTURE	
Number of TSOs	2
Total length of transmission network(s)	approx. 1,600 km
Total compressor power	621 MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
Gas Connect Austria GmbH	– Baumgarten/Eustream (SK) – Überackern ABG/Bayernets (DE) – Überackern SUDAL/Bayernets (DE) – Mosonmagyaróvár/FGSZ (HU) – Murfeld/Plinovodi (SI) – Petrzalka/SPP Distribution (SK) – Oberkappel/Open Grid Europe (DE) – Oberkappel/GRTgaz Deutschland (DE)
Trans Austria Gasleitung GmbH	– Baumgarten/Eustream (SK) – Tarvisio-Arnoldstein/Snam Rete Gas (IT)
STORAGE FACILITIES	
Interconnected DSOs (All storage facilities are connected to the DSO network (except Haidach, which is connected to German networks and 7 Fields, which is connected to the Transmission System and to the Distribution System). Domestic market capacity is managed by Austrian Gas Grid Management AG (AGGM) in its function as Distribution Area Manager.)	– Schönkirchen Reyersdorf/OMV Gas Storage Austria – Tallesbrunn/OMV Gas Storage Austria – Thann/OMV Gas Storage Austria – Puchkirchen/RAG – Haidach 5/RAG – Haidach/RAG/Wingas/Gazprom Export – 7 Fields/Eon Gas Storage
PRODUCTION FACILITIES	
Interconnected DSs (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	
	– Total: 1 – Gas-fired power plants • Number: 0
PHYSICAL TS-DS CONNECTIONS AND TOTAL NUMBER OF DSOS IN THE COUNTRY	

Gas Connect Austria GmbH	– Number of physical TS-DS connections: 1 – Number of DSOs: 1
Trans Austria Gasleitung GmbH	– Number of physical TS-DS connections: 9 – Number of DSOs: 1
Physical hubs and Virtual Trading Points	– CEGH
Number of balancing zones	1

DEMAND

Historical annual gas demand of the national market (final customers)	2015: 84,384 GWh 2014: 78,907 GWh 2013: 86,572 GWh 2012: 91,059 GWh

NETWORK OVERVIEW

Austria is a transit country for natural gas to Europe. The main recipients are Germany or Western Europe respectively (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). As of 01 January 2013 a new Market Model was introduced in Austria which caused the transfer of a Point-to-Point System to an Entry/Exit System. Additionally, capacities that were previously allocated on a First-Come-First-Served Basis have been auctioned on the European Auction Platform PRISMA Primary according to the CAM Network Code since 01 April 2013.

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 (this excludes distribution)	170 km Operated: approx. 1,600 km
Total compressor power	40 MW
Total transported energy (in gas)	2012: 93,882 GWh
Ratio of transported energy over demand of the national market (2012)	1.03
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: 347,092 GWh/a
Ratio of transported energy over demand of the national market (2015)	4.11
Unbundling model	ITO

Bulgaria

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	1
Total length of transmission network(s)	2,765 km
Total compressor power	Transmission: 274 MW Storage: 10 MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
Bulgartransgaz	– Negru Voda I & II, III/Transgaz (RO) – Kulata/Sidirokastron/DESFA (GR) – Malkoclar/BOTAŞ (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: 206 – Gas-fired power plants • Number: 0
DISTRIBUTION SYSTEMS SOs AND TOTAL NUMBER OF DSOs IN THE COUNTRY	
Bulgartransgaz	– Number of physical TS-DS connections: 102 – Number of DSOs: 16
Physical hubs and Virtual Trading Points	N/A
Number of balancing zones	2

DEMAND

Historical annual gas demand of the national market (final customers)

- 2015: 31,390 GWh
- 2014: 28,405 GWh
- 2013: 28,594 GWh

NETWORK OVERVIEW

Gas infrastructure of Bulgartransgaz EAD on the territory of the Republic of Bulgaria consists of the national gas transmission network that ensures natural gas to the main part of the Bulgarian users, the gas transmission network for transit transmission ensuring chiefly natural gas transport to Turkey, Greece and FYRoM and the underground gas storage in Chiren (Chiren UGS), directly connected to the national gas transmission network. Since the beginning of 2014 both networks are interconnected at GMS Ihtiman. In February 2017 was issued the permit for use of the second interconnection between the two networks, at GMS Lozenets.

NATIONAL GAS TRANSMISSION NETWORK

The national gas transmission network is built in a ring-shaped form of high pressure gas pipelines with a total length of 1,835 km, three compressor stations – CS Kardam-1, CS Valchi Dol and CS Polski Senovets with total installed capacity of 49 MW, cleaning facilities, electrochemical protection system, communications system, information system, 240 metering lines to connected users at 115 exit points (AGRS, GMS). Its technical transport capacity amounts to 7.4 bcm/year, and the maximum working pressure is 54 bar.

GAS TRANSMISSION NETWORK FOR TRANSIT TRANSMISSION

The transit gas transmission network comprises high pressure gas pipelines of total lentgh of 930 km with prevailing diameter of DN 1000, six compressor stations – CS Kardam-2, CS Provadia, CS Lozenets, CS Strandja, CS Ihtiman and CS Petrich, with total installed capacity of 225 MW, electrochemical protection system, cleaning facilities, communications system, information system and other ancillary facilities. Its total technical capacity for natural gas transit transmission amounts to 17.8 bcm/year and the maximum working pressure is 54 bar.

UNDERGROUND GAS STORAGE (UGS) CHIREN

The Underground Gas Storage Chiren was built on the lands of Chiren village based on the already depleted gas condensate field. It is equipped with specialized underground and surface facilities required to secure injection, production and quality of the stored gas. Chiren UGS is also equipped with a compressor station with total installed capacity of 10 MW. The present storage capacity can provide storage of 550 mcm natural gas. The withdrawal and injection capacity according to the formation pressures and other factors is of 0.5 mcm/d (minimum) up to 3.4 mcm/d (maximum) for withdrawal, in case of emergency withdrawal the maximum capacity is up to 4.2 mcm/d at the following conditions – emergency situation, full gas storage reservoir and for a short time period (a maximum of 30 days), and 0.5 mcm/day (minimum) to 3.16 mcm/d (maximum) for injection.

BULGARTRANSGAZ

Website	http://www.bulgartransgaz.bg/en
Current Publications	N/A
Total length of the transmission network (this excludes distribution)	2,765 km
Total compressor power	Transmission: 274 MW Storage: 10 MW
Total transported energy (in gas)	174,544 GWh
Ratio of transported energy over demand of the national market (2015)	5.56
Unbundling model	ITO

Croatia

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	1
Total length of transmission network(s)	2,693 km
Total compressor power	– MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
PLINACRO	– Rogatec/Plinovodi (SLO) – Donji Miholjac (Dravaszerdehaly)/FGSZ (HU)
LNG TERMINALS	
	–
STORAGE FACILITIES	
PLINACRO	PSP OKOLI/Podzemno skladište plina
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 – Gola/INA – Hampovica/INA
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)	– 2015: 25.494 GWh – 2014: 24.811 GWh – 2013: 28.721 GWh – 2012: 29.954 GWh – 2011: 31.914 GWh

NETWORK OVERVIEW

At the beginning of the new millennium, in compliance with EU Directive, the reform of the energy sector (and consequently, of the gas sector) in the Republic of Croatia started. On February 1, 2001 Plinacro Ltd. was founded as a company for natural gas transmission and trade, at the beginning as a member of INA Group and 100 percent owned by INA.

In July 2001, the Government of the Republic of Croatia brought the package of energy acts, necessary for further reform of the energy sector. In compliance with new acts, primarily with the Energy Act, the gas transmission becomes an energy activity performed as a public service. On March 11, 2002 Plinacro became a 100 percent state-owned company. By establishing Plinacro Ltd, an organisation for introducing natural gas market liberalisation in compliance with EU Directive requirements was founded, providing its consumers with the possibility to choose from different suppliers and free access to the gas transmission system. The Committee for regulation of energy activities by their decision dated December 10, 2003 (class: UP/034-02/03-08/01, reg. no. 371-02/03-04), issued to Plinacro the licence for performance of energy activity – gas transmission, and thereby the company acquired all necessary preconditions for the performance of its main activity.

Since necessary preconditions for the implementation of the open energy market are development and infrastructure building, in April 2002, Plinacro prepared the Plan of Development, Construction and Modernisation of the Gas Transmission System of the Republic of Croatia from 2002 to 2011. The Plan was made on the basis of the Strategy of Energy Development of the Republic of Croatia approved by the Croatian Parliament in 2002.

Plinacro acquired 100 % share in the company Podzemno skladište plina, the main activity of which is underground storage of gas – UGS Okoli on 30 April 2009.

The Plan of Development, Construction and Modernisation of the Gas Transmission System of the Republic of Croatia until 2011, implemented by Plinacro, was the largest investment project in the energy infrastructure.

Aiming at the long-term security of supply of consumers, Plinacro has been designing and developing its transmission system in such a way so it can be connected to and included in the international gas pipeline grid. Therefore significant means have been invested in the construction of the interconnections which are to connect the Croatian gas transmission system with the gas transmission systems of the neighbouring countries and in that way provide the diversification of supply and possibility for the transit of gas for these countries.

Croatia became an EU member on 1 July 2013.

In compliance with the Third energy package Plinacro commenced a certification procedure in May 2013. Plinacro has chosen the ownership unbundling model.

In 2016, 27,689 GWh of gas was taken over into the transmission system, which is an increase by 5 % compared to 2015. Out of the totally delivered gas quantities the share of gas produced in Croatia was 39 %, the share of gas from import was 46 %, while the share of gas taken over from UGS Okoli was 15 %. Gas entry from production fields has increased by 12.11 %, while the entry of gas from import has decreased by 25.95 %.

In 2016, 27,648 GWh of gas was delivered from the gas transmission system which is an increase by 4.84 % compared to 2015.

Technical capacities at entries and exits from the transmission system provided safe and secure gas supply.

PLINACRO

Website	www.plinacro.hr
Current Publications	TYNDP 2017–2026
Total length of the transmission network (this excludes distribution)	2,693 km
Total compressor power	–
Total transported energy in2016 (in gas)	27,689 GWh
Ratio of transported energy over demand of the national market (2015)	1
Unbundling model	Ownership unbundling (OU)

Greece

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	1
Total length of transmission network(s)	1,459 km
Total compressor power	13 MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
DESFA	– Kula/Sidirokastron – Bulgartransgaz (BG) – Kipi – Botaş (TK)
LNG TERMINALS	
	Revythoussa
STORAGE FACILITIES	
	N/A
PRODUCTION FACILITIES	
	N/A
DIRECTLY CONNECTED CUSTOMERS	
	– Total: 41 – Gas-fired power plants: 12

DISTRIBUTION SYSTEMS SOs AND TOTAL NUMBER OF DSOs IN THE COUNTRY

	– Number of physical TS-DS connections: 24 – 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)	2016: 43,705 GWh 2015: 32,801 GWh 2014: 31,603 GWh 2013: 41,452 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.

– An extension to the centre of the Peloponese, in the south, was commissioned in October 2015 and an upgrade of the LNG terminal is under construction and due to be commissioned by mid 2018. 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 the South Kavala UGS in Northern Greece.

– In 2016 gas was imported mainly from the Sidirokastro IP (64 %). LNG marked an increase (20 % in 2016 compared to 19 % in 2015 while the remaining 16 % was imported from Turkey.

DESFA S.A.

Website	www.desfa.gr
Current Publications	– 10-year Network Development Study (mandatory) 2018–2027 – 10-year Network Development Plan (mandatory) 2017–2026
Total length of the transmission network (this excludes distribution)	1,464 km
Total compressor power	13 MW
Total transported energy (in gas) in 2015	32,801 GWh
Ratio of transported energy over demand of the national market (2015)	1.0
Unbundling model	ITO

Hungary

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	2
Total length of transmission network(s)	5,873 km
Total compressor power	240 MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
FGSZ	– Beregdaróc 1,400/Ukrtransgas (UA) – Beregdaróc 800/Ukrtransgas (UA) – Mosonmagyaróvár/Gas Connect Austria (AT) – Kiskundorozsma/Srbijagas (RS) – Csanádpalota/Transgaz (RO) – Csanádpalota/Transgaz (RO) – Drávaszerdahely/Plinacro (HR) – Drávaszerdahely/Plinacro (HR) – Vecsés 4/MGT
MGT	– Balassagyarmat (HU > SK)/eustream a.s (SK) – Balassagyarmat (SK > HU)/eustream a.s (SK) – Vecsés 4/FGSZ
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
DIRECTLY CONNECTED CUSTOMERS	
FGSZ	– Total: 39 – Gas-fired power plants • Number: 15
DISTRIBUTION SYSTEMS SOs AND TOTAL NUMBER OF DSOs IN THE COUNTRY	
FGSZ	– Number of physical TS-DS connections: 361 – 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)	– 2016: 102,334 GWh – 2015: 95,012 GWh – 2014: 86,772 GWh – 2013: 97,166 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 DN 100 and DN 1400, 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.

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 (this excludes distribution)	5,782 km
Total compressor power	233 MW
Total transported energy in 2015 (in gas)	147,172 GWh
Ratio of transported energy over demand of the national market (2015)	1.55
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	7 MW
Total transported energy in 2015 (in gas)	276 GWh
Ratio of transported energy over demand of the national market (2015)	n. d (commissioning year, test mode)
Unbundling model	OU

Italy

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	9 (Source: AEEGSI Annual Report 2017)
Total length of transmission network(s) (31/12/2015)	34,857 km
Total compressor power (31/12/2015)	877 MW

INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
Snam Rete Gas	– Passo Gries/FluxSwiss (CH) – Passo Gries/Swissgas (CH) – Tarvisio/TAG (AT) – Gorizia/Plinovodi (SI) – Gela/Greenstream (LY) – Mazara del Vallo/TPMC (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 %)
- 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 %) and Blugas Infrastrutture (10 %)

PRODUCTION FACILITIES (interconnected to the national network)

Snam Rete Gas

- 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
- 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
- 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: 3,196
- 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: 3,911
- Number of DSOs: 219
  (Source: AEEG Annual Report, 2017; 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)	– 2016: 741,786 GWh – 2015: 713,026 GWh – 2014: 654,559 GWh – 2013: 740,833 GWh

NETWORK OVERVIEW

The natural gas injected into the National Network originates from imports mainly from Russia, Northern Europe and North Africa and, to a lesser extent, national production and LNG regasification plants. The import gas is injected into the National Network via eight entry points where the network joins up with the import pipelines (Mazara del Vallo from Tunisia, Gela from Libya), the import/export pipelines (Tarvisio with Austria, Gorizia with Slovenia, Passo Gries with Switzerland) and the LNG regasification terminals (Panigaglia and Livorno in the Ligurian sea and Cavarzere in the North Adriatic).

Snam Rete Gas' infrastructures are managed by eight Districts, which supervise and oversee the activities of 48 Maintenance Centres across Italy, and by a Dispatching Centre that coordinates 11 Compressor Stations.

The National Gas Pipeline Network of Snam Rete Gas consists mainly of pipes, which usually have a large diameter, (up to 56"), used to transport gas from the entry points (imports and main domestic production) to the interconnection points with the Regional Transmission Network and storage facilities. Snam Rete Gas pipelines are therefore divided into a National Gas Pipeline Network (of approximately 9,600 km) and a Regional Transmission Network (of approximately 23,000 km), representing the physical backbone of a fully meshed and decoupled entry-exit system.

The Cavarzere Entry Point is connected to a dedicated transmission infrastructure owned and operated by Infrastrutture Trasporto Gas. Such infrastructure consists in a 36", 83 km long pipeline operated at 75 bar and has a transmission capacity equal to approximately 9.6 Bsm³.

Società Gasdotti Italia network is composed by around 1,500 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 Bsm³. 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 S.P.A. (Società per Azioni – Joint Stock Company)

Website	http://www.snamretegas.it
Current Publications	Development Plan of SRG Network – Ten year basis (mandatory)
Total length of the transmission network (this excludes distribution)	32,534 km
Total compressor power	877 MW
Total transported energy (in gas) in 2015	711,051 GWh
Ratio of transported energy over demand of the national market (2015)	1
Unbundling model	Ownership Unbundling

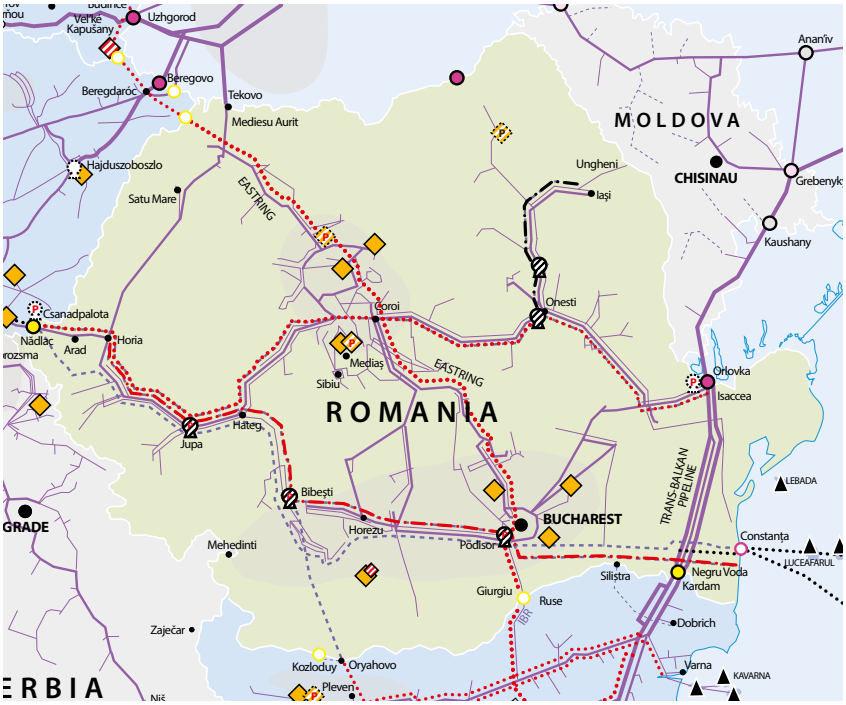
INFRASTRUTTURE TRASPORTO GAS S.P.A. (Società per Azioni – Joint Stock Company)

Website	http://www.infrastrutturetg.it
Total length of the transmission network (this excludes distribution)	83 km

SOCIETÀ GASDOTTI ITALIA S.P.A. (Società per Azioni – Joint Stock Company)

Website	http://www.gasdottitalia.it
Total length of the transmission network (this excludes distribution)	1,561 km

Romania



EXISTING GAS INFRASTRUCTURE	
Number of TSOs	1
Total length of transmission network(s)	13,300 km
Total compressor power	29 MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
SNTGN Transgaz SA	– Csanadpalota/FGSZ HU – Negru voda I/Bulgartransgaz (BG) – Negru voda II/Bulgartransgaz (BG) – Negru voda III/Bulgartransgaz (BG) – Mediesul Aurit – Isaccea Import/Ukrtransgaz (UA) – Isaccea I/Uktransgaz (UA) – Isaccea II/Uktransgaz (UA) – Isaccea III/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 Sarmasel/Sarmasel (RO)/SNGN Romgaz SA – Underground Storage Balaceanca/Balaceanca (RO)/SNGN Romgaz SA – Underground Storage Bilciuresti (Butimanu)/Bilciuresti (Butimanu) (RO)/SNGN Romgaz SA – Underground Storage Cetatea de Balta/Cetatea de Balta (RO)/SNGN Romgaz SA – Underground Storage Ghercesti/Ghercesti (RO)/SNGN Romgaz SA – Underground Storage Urziceni/Urziceni (RO)/SNGN Romgaz SA – Underground Storage Tg. Mures/Tg. Mures (RO)/DEPOMURES SA

PRODUCTION FACILITIES

SNTGN Transgaz SA	– 82 entry points/Romanian territory/SNGN Romgaz SA – 42 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

DIRECTLY CONNECTED CUSTOMERS

SNTGN Transgaz SA	– Total: 221 – 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: 881 – Number of DSOs: 37
Physical hubs and Virtual Trading Points	N/A
Number of balancing zones	1

DEMAND

Historical annual gas demand of the national market (final customers)	– 2015: 121,726 GWh – 2014: 127,608 GWh – 2013: 132,603 GWh

NETWORK OVERVIEW

Gas transmission Operator "TRANSGAZ" S.A. is the technical 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 13,300 km (out of which 553 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 29 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, 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 2014 – 2023 http://new.transgaz.ro/sites/default/files/plan_de_dezvoltare_pe_10_ani_2014_-_2023_14.12.2014.pdf – 10 Years Network Development Plan 2016 – 2025 – (to be issued)
Total length of the transmission network (this excludes distribution)	13,300 km
Total compressor power	29 MW
Total transported energy in 2015 (in gas)	131,315 GWh
Ratio of transported energy over demand of the national market (2015)	1.08
Unbundling model	ISO

Slovakia

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	1
Total length of transmission network(s) (31/12/2016)	2,273 km
Total compressor power (31/12/2016)	541 MW
INTER-TSO CONNECTIONS WHERE CAPACITY IS MARKETED (incl. upstream operators)	
Eustream	– Veľké Kapušany and Budince – Ukrtransgaz (UA)/Eustream (SK) – Baumgarten – Eustream (SK)/Gas Connect Austria, BOG, Trans Austria Gasleitung (AT) – Lanžhot – Eustream (SK) /Net4Gas (CZ) – Veľké Zlievce – Magyar Gáz Tranzit (H)/Eustream (SK)
LNG TERMINALS	
	N/A
STORAGE FACILITIES	
Eustream	– NAFTA a.s. (NAFTA is also connected to the DSO – SPP-distribucia, a.s.) – POZAGAS a.s. (not connected to the Eustream transmission system)
PRODUCTION FACILITIES	
Eustream	NAFTA a.s. (NAFTA is also connected to the DSO – SPP-distribucia, a.s.)
DIRECTLY CONNECTED CUSTOMERS	
Eustream	– Total: 0 – Gas-fired power plants: –
DISTRIBUTION SYSTEMS SOs AND TOTAL NUMBER OF DSOs IN THE COUNTRY	
Eustream	– Number of physical TS-DS connections: 8 – Number of DSOs: 1
Physical hubs and Virtual Trading Points	1
Number of balancing zones	1

DEMAND

Historical annual gas demand of the national market (final customers)

- 2015: 49,700 GWh
- 2014: 47,000 GWh
- 2013: 54,300 GWh
- 2012: 55,300 GWh

NETWORK OVERVIEW

Since 1972, Eustream has secured the transmission of 2.4 trillion cubic meters of natural gas across the territory of the Slovak Republic, successfully continuing the more than 160 years long tradition of the Slovak gas industry.The annual capacity of the transmission system operated and maintained 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 responded to the 2009 Gas Crisis by reviewing its interconnections with neighboring countries. The EU co-funded several Eustream's projects increase security of supply not only in Slovakia but in the whole region. These projects include the Slovak Reverse Flow, Slovakia-Hungary Interconnector, a planned Poland-Slovakia Interconnector and Modification of gas turbines to the Dry Low Emissions system. Thanks to the continual modernization and upgrade of infrastructure, Eustream contributes to ensuring safe and reliable gas supplies to Central and Western Europe and also to Ukraine whilst doing its utmost to reduce the environmental impact of its activities. In this respect, one of the main challenges faced is the reduction of carbon emissions produced at the four gas compressor stations operated. 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 legislation and gas industry standards. The business partners of Eustream include major energy companies from EU and non-EU member states.

EUSTREAM, A.S. (Joint Stock Company)

Website	www.eustream.sk
Current Publications	Annual reports
Total length of the transmission network (this excludes distribution)	2,273 km
Total compressor power	541 MW
Total transported energy in 2015 (in gas)	591,130 GWh
Ratio of transported energy over demand of the national market (2015)	11.9
Unbundling model	ITO

Slovenia

EXISTING GAS INFRASTRUCTURE	
Number of TSOs	1
Total length of transmission network(s)	1,155 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: 148 – 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: 14
Physical hubs and Virtual Trading Points	Virtual Trading Point (VTP-SI) in Slovenia.
Number of balancing zones	1

DEMAND

Historical annual gas demand of the national market (final customers)

- 2015: 8,869 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)	1,155 km
Total compressor power	19,5 MW
Total transported energy in 2015 (in gas)	20,066 GWh
Ratio of transported energy over demand of the national market (2015)	2.26
Unbundling model	ITO

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