

# Ten Year Network Development Plan 2020-2029

## Main challenges and tasks for the new UA-TSO



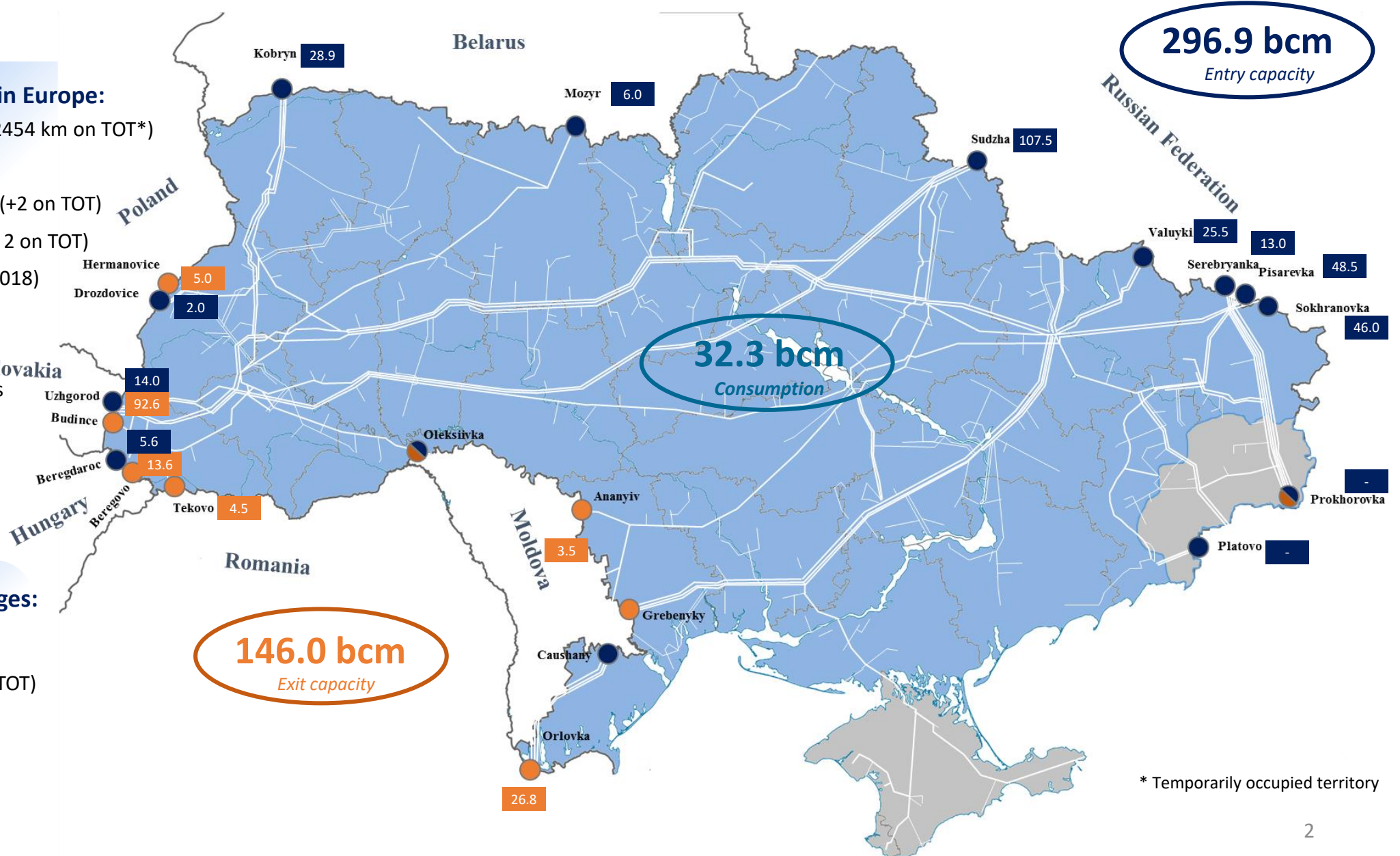
# UA-TSO gas system at a glance

## One of the biggest GTS in Europe:

- 35 441 km pipelines (+ 2454 km on TOT\*)
- 1 389 GDS (+83 on TOT)
- 71 Compressor stations (+2 on TOT)
- 87 Compressor shops (+ 2 on TOT)
- 18 355 peoples (31.12.2018)
- Network users
  - 41 DSO companies
  - 153 direct consumers
  - 186 shippers

## Underground gas storages:

- 11 UGS (+2 on TOT)
- 30.5 bcm (+1,4 bcm on TOT) (capacity of storages)



**296.9 bcm**  
Entry capacity

**32.3 bcm**  
Consumption

**146.0 bcm**  
Exit capacity

\* Temporarily occupied territory

**Other actors of the Energy sector**

# Ecosystem



# Concertation

**Directly connected customers (153)**

**UA TRANSMISSION SYSTEM OPERATOR**

**Transport**

**НКРЕКП**

**Regulator**

КАБІНЕТ МІНІСТРІВ УКРАЇНИ  
CABINET OF MINISTERS OF UKRAINE

**СМУ**

**Customers on distribution**

**DSOs (41)**

**Distribution**

**EUROPE:**  
EC, ACER, ENTSOG, ...

МІНІСТЕРСТВО ПАЛИВА ТА ЕНЕРГЕТИКИ УКРАЇНИ

**Ministry of Energy**

ВЕРХОВНА РАДА УКРАЇНИ

**Deputies**

**Neighboring TSOs**

**Storages SSO**

**New SSO**

**Shippers Traders (186)**

**Gas producers**

# EU gas network assessment template also considered to establish the UA-TSO TYNDP

## Market integration

Multidirectional flows, flexibility and  
price convergence

## Sustainable development

Reducing greenhouse gases emissions

## Competitiveness

Optimized  
access and dependence  
to resources

## Security of supply

Stress-Resiliency, complementarity  
and solidarity

Supply sources

Climatic conditions

Infrastructure

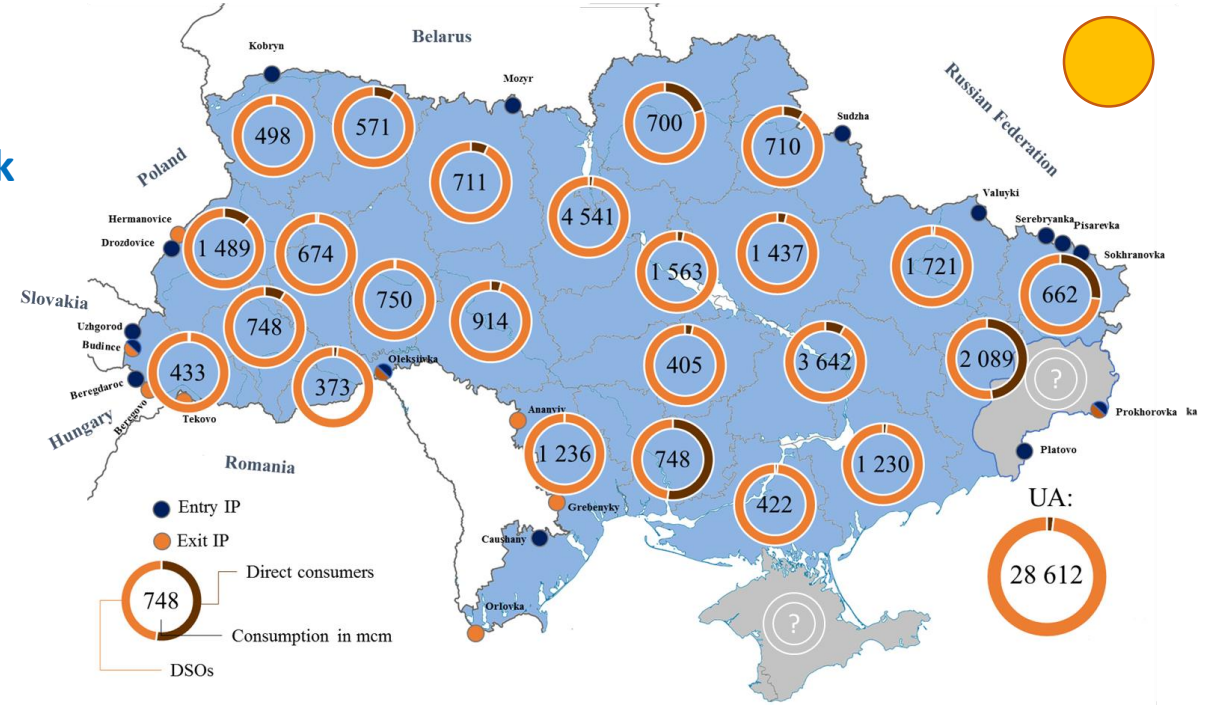
- Comprehensive modelling of Ukraine and interconnected neighboring gas infrastructures
- Consistent demand, supply and infrastructure scenarios

# Gas demand in Ukraine: direct customers and DSO

More than 95% of the domestic consumption is carried by DSO connected to the transmission network

## Gas consumption in Ukraine includes:

- **Customers directly connected to the transmission network**  
big industries and heat/power stations
- **Customers connected to distribution networks**  
residential, commercial and industrial sectors  
and also big industries and heat/power stations



Consumptions direct customers and DSO networks in 2018

Total consumption\* of natural gas in Ukraine for 2018 amounted to 28.6 bcm:

Kiev, Dnepropetrovsk and Donetsk regions have the largest gas consumption, with large populations and important industries, mainly in the metallurgy and chemistry sectors that take 38.6% of all industrial gas consumption

(\*) excluding gas consumption used to operate gas production facilities and gas infrastructures.

# Security of supply: Domestic production and storages

## Large storage capacities are in the West of Ukraine

Volume: 30.9 bcm

Injection: 252.4 mcm/d      Withdrawal: 260.1 mcm/d

The underground storage operator is the result of the recent split of Ukrtransgaz into separated TSO and SSO

## Important gas domestic production in Ukraine: It satisfies 62.6% of the Ukrainian gas market needs

**Ukraine\***: 19.0 bcm

Norway: 127.3 bcm

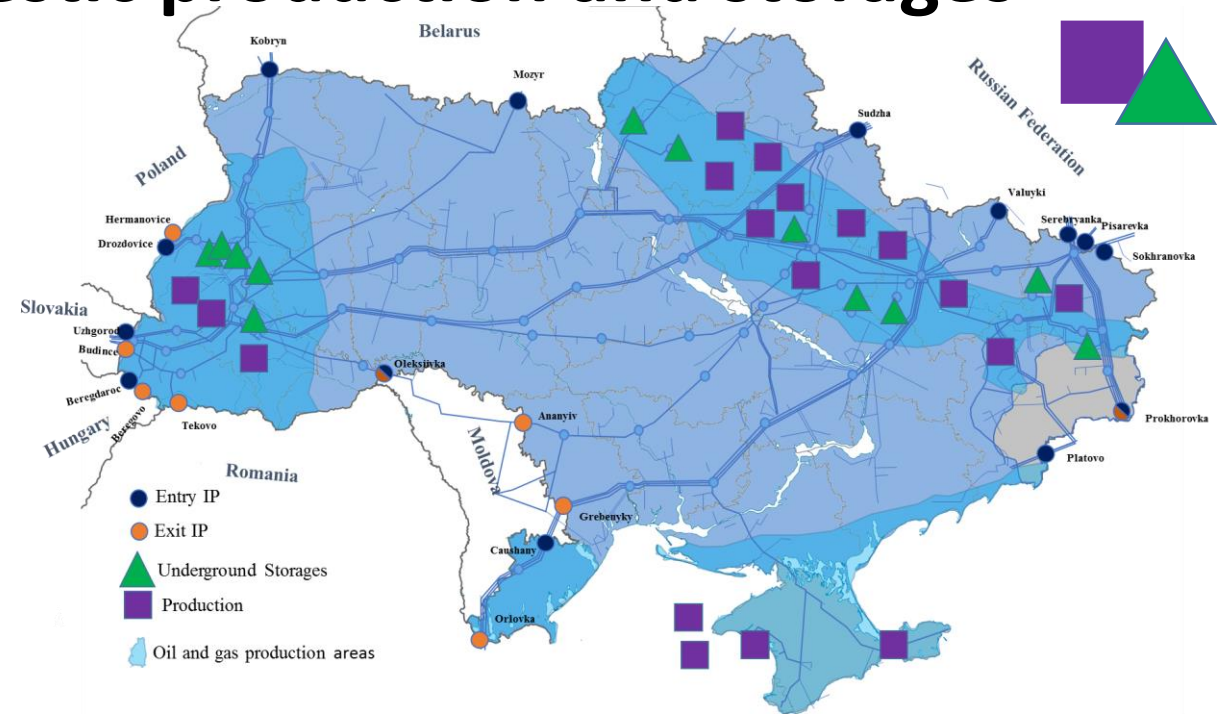
Great Britain: 42.8 bcm

Netherland: 34.0 bcm

## Main gas production is in Kharkiv and Poltava regions (about 90% of total)

Gas production is also carried out in 10 other regions: Lviv (3.5% of total), Dnepropetrovsk (2.5%), Ivano-Frankivsk (2.5%), and finally Luhansk, Sumy, Chernihiv, Zakarpattia, Kherson, Chernivtsi and Volyn (1%)

## Underground storages give an important flexibility for Ukraine and Europe, especially in the winter when they can bring necessary volumes and speed up gas flows to Europe.



Gas production and storage facilities in Ukraine (■, ▲)

(\*) excluding gas consumption used to operate gas production facilities.

# Interconnections with other gas markets

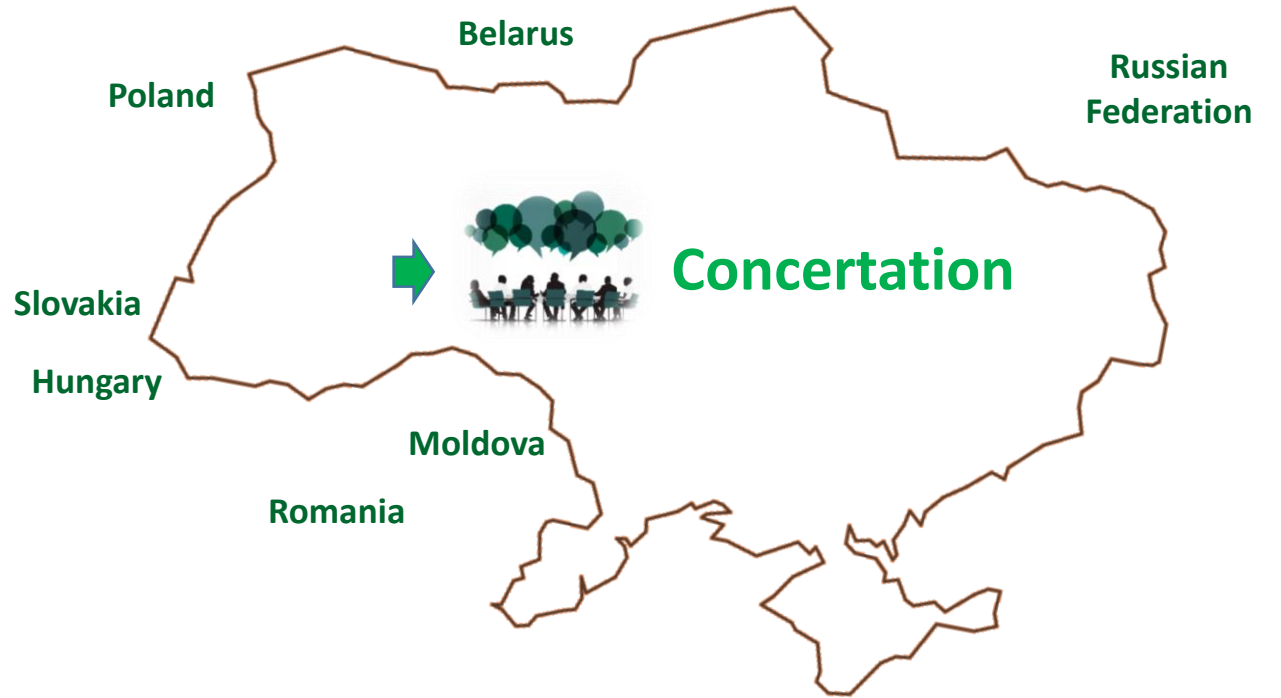
**296.9 bcm**  
*Entry capacity*



**146.0 bcm**  
*Exit capacity*

**For the preparation of the UA-TSO TYNDP, the TYNDP and planning documents of the neighboring TSO have been taken into account.**

The coherence between the development plans of the adjacent players is a guarantee of a better understanding of the TYNDP of the UA-TSO.



**Large interconnection with the neighboring gas markets is a key advantage of the Ukrainian gas system.**

EU domestic production North Sea

Production Norway

Production Russian Federation



LNG

EU Consumption

# Integrated Ukrainian Gas System

Production Algeria

Production Libya

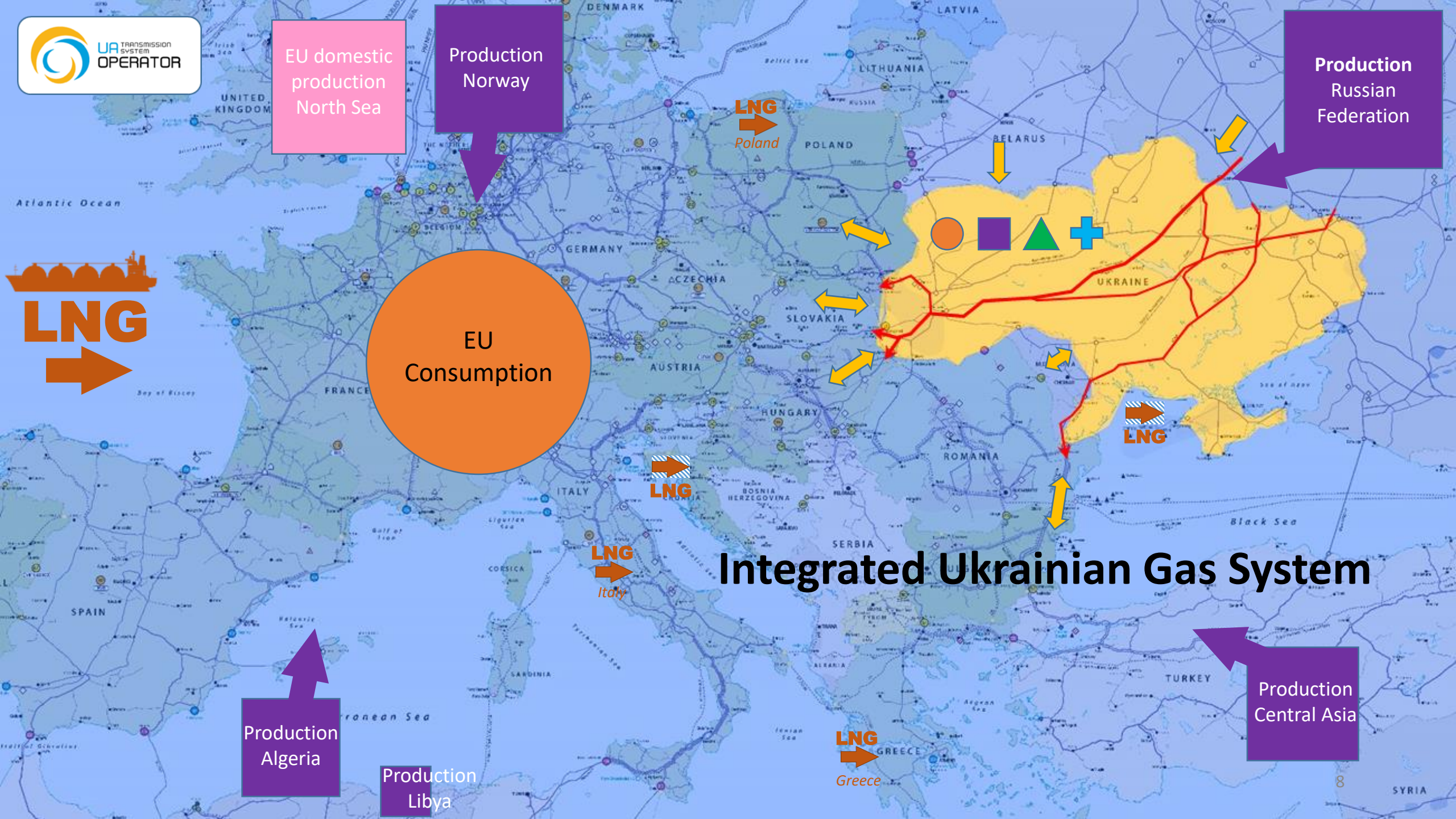
Production Central Asia

LNG Poland

LNG Italy

LNG Greece

LNG





# New areas for the gas business development

## Demand/Supply and Market:

- LNG: new terminal facilities in UA
- Elec-Gas systems complementarity

## Performance:

- Digital: at every level of the company
- Data modeling: system design
- Metering: new methods

## New activities:

- Gas mobility: Bus, trucks, trains
- Bio-methane: Renewable injected

## Energy transition:

- Hydrogen: hydrolysis or steam-reforming
- CCS and CO<sub>2</sub>: transmission and storage

## Conventional R&D:

- Gas system equipment
- Technologies using gas

**The energy market is in evolution:** looking for better results (financial and technical).

**Digitalization and Energy transition** are opening news fields of research and development.

**R&D is to be developed** with Ukrainian partners and at European and worldwide levels.





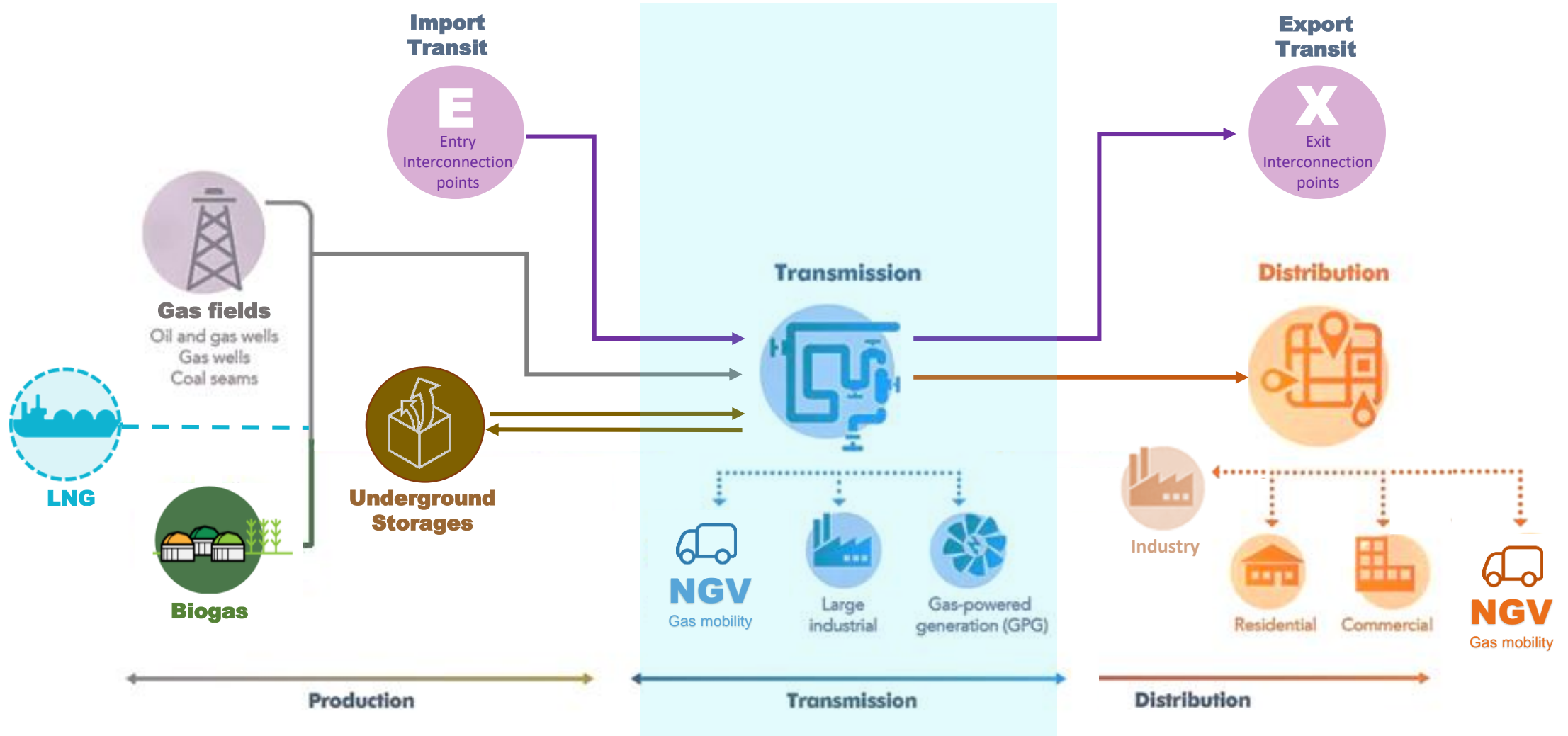
**Thank you for your attention!**

**Merci pour votre attention !**

**Дякуємо вам за увагу!**

# Back-up

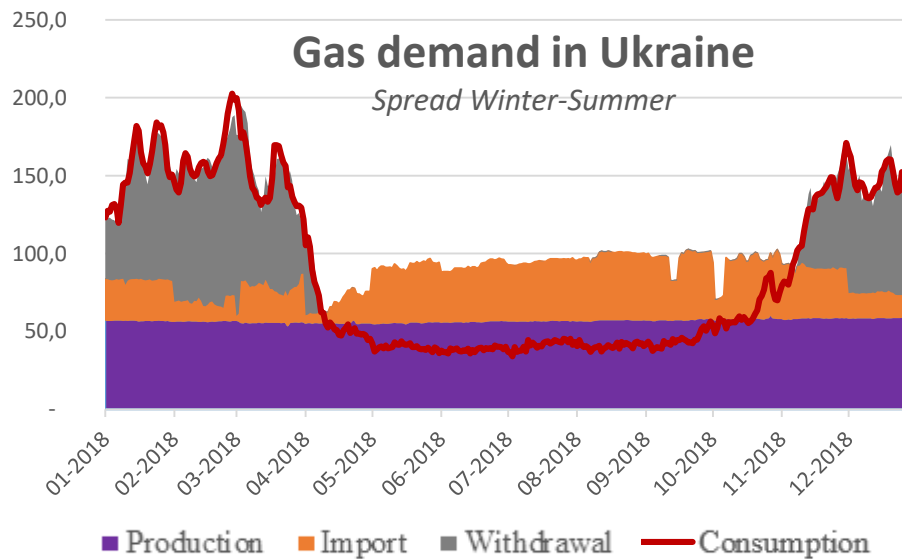
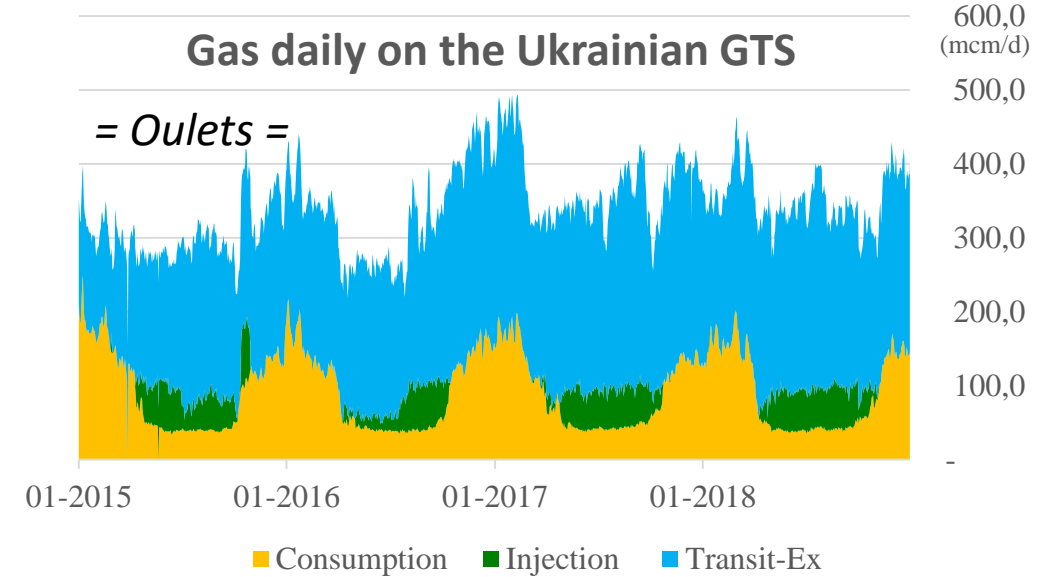
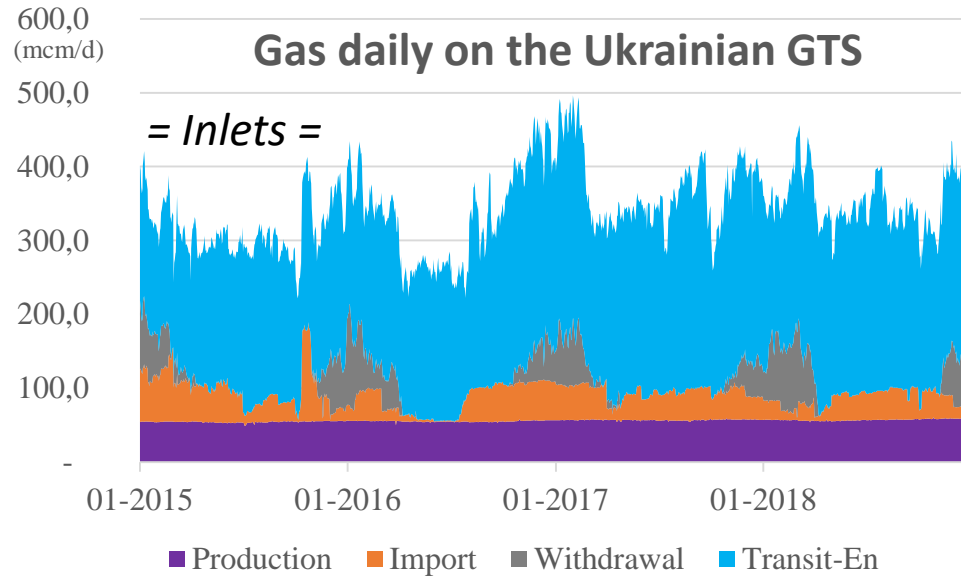
# Connected gas infrastructures



**Transmission network connects Supply and Demand**

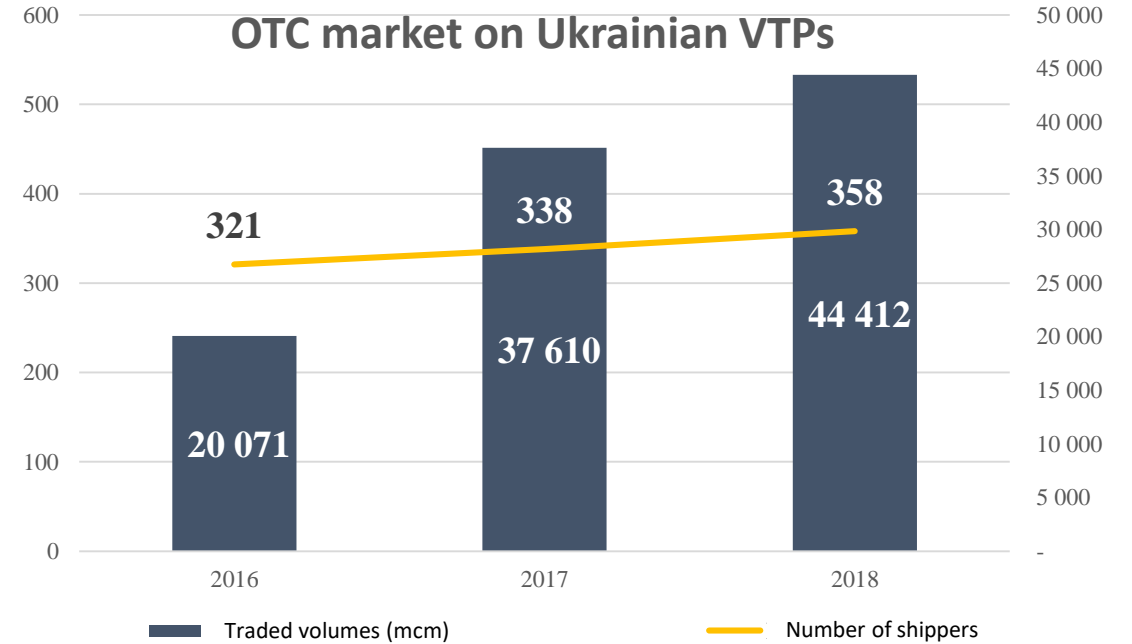
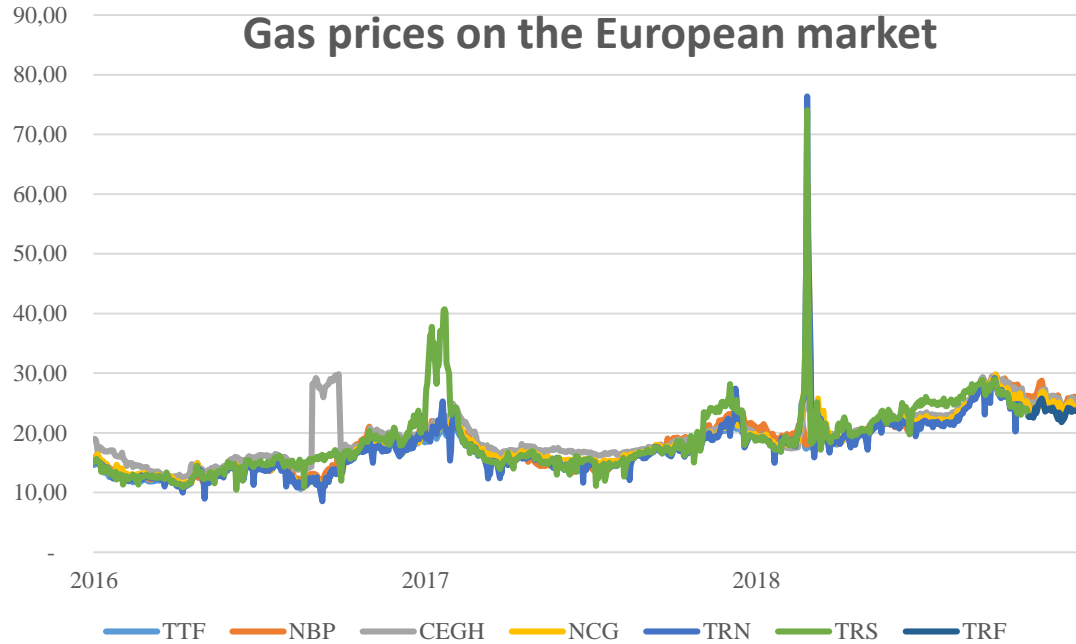
*A healthy TSO means a healthy gas chain*

# Dynamics of the gas system: technical facts



- A TSO has to face different gas flow situations daily and along the year.
- Capacity analysis allow to adapt its network and offer for the benefit of the customers.

# Dynamics of the gas system: economical facts



**Guaranteed and flexible access to resources and gas system balancing are key factors for a fair gas market and stable prices.**

# Interconnected with European projects



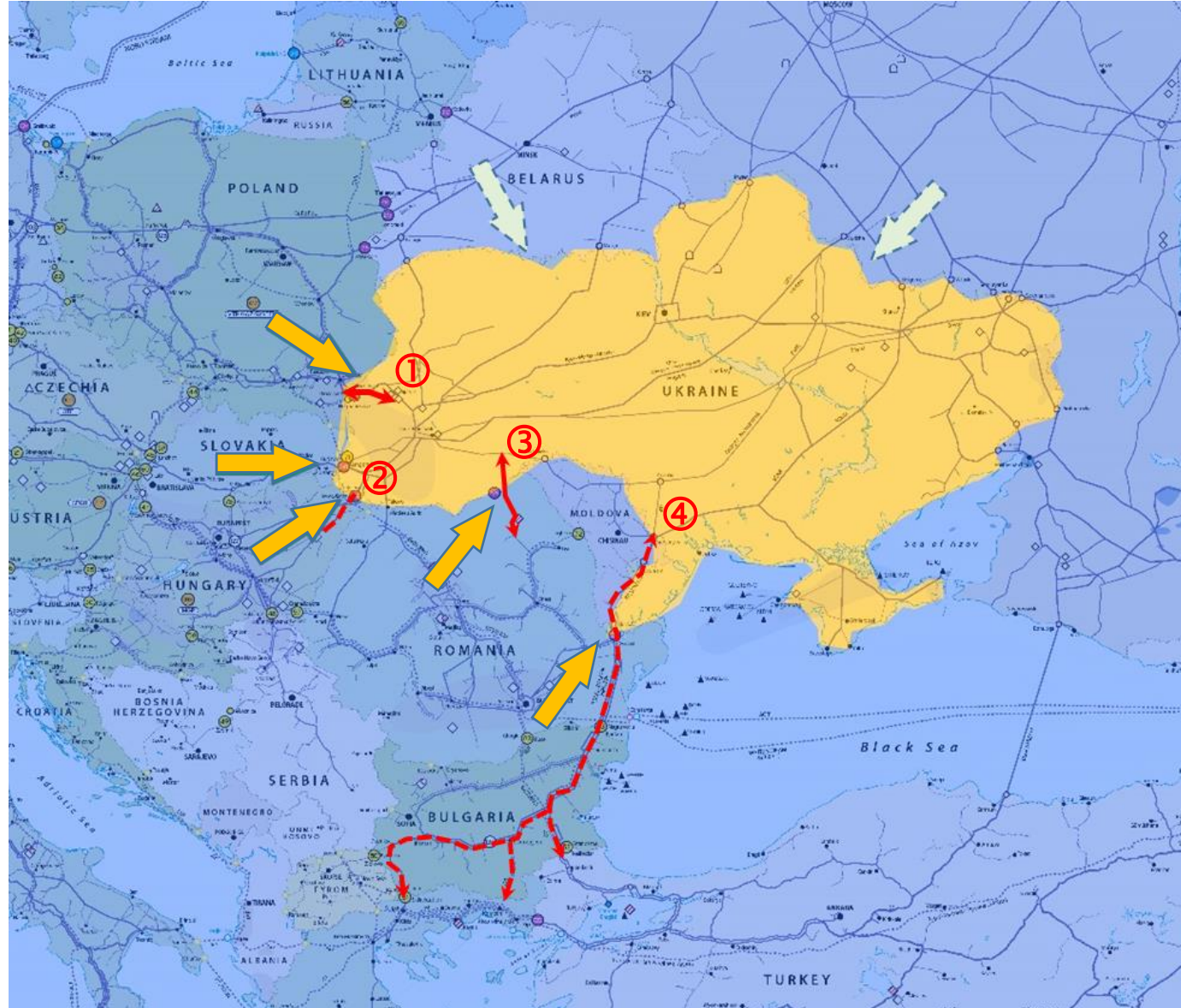
[https://ec.europa.eu/energy/infrastructure/transparency\\_platform/map-viewer/main.html](https://ec.europa.eu/energy/infrastructure/transparency_platform/map-viewer/main.html)

Energy Community		
PMI and PECI with Ukraine		
① Interconnector Poland-Ukraine	PMI	
② Reverse flow Hungary-Ukraine	had PMI status in 2016 - 2018	The status of the project is not determined due to the lack of a source of investment for the Hungarian side.
③ Interconnector Romania - Ukraine	New project	New joint Ukrainian and Romanian project submitted for ENTSOG TYNDP 2020. Project will be submitted to PECI/PMI.
④ Trans-Balkan Bi-directional Flow	PECI Ukraine, Moldova, Romania, Bulgaria, Greece	Only Ukrainian and Moldavian part got PECI status. Other countries did not submit for application form.

<https://www.energy-community.org/>

- Terminal for liquefied natural gas (LNG)
- Storage facility
- Reverse flow
- Compressor station
- Adaptation low to high
- Node
- Pipeline
- Gas hub

# Interconnection: main projects ①②③④



## ① Interconnector Poland-Ukraine

**Project promoters:** PJSC «UKRTRANSGAZ»  
GAZ-SYSTEM S.A.

**PL-UA:** 5-8 bcm

**UA-PL:** 5-7 bcm

**Commissioning:** IVQ 2022

## ② Reverse flow Hungary-Ukraine

**Project promoters:** PJSC «UKRTRANSGAZ»  
FGSZ Ltd.

**HU-UA:** 6.2 bcm

**Commissioning:** Completed in 2016 (Ukrainian part)

## ③ Interconnector Romania - Ukraine

**Project promoters:** PJSC «UKRTRANSGAZ»  
«TRANSGAZ» S.A.

**RO-UA:** 4 bcm

**UA-RO:** 4 bcm

**Commissioning:** 2019

## ④ Trans-Balkan Bi-directional Flow

**Project promoters:** PJSC «UKRTRANSGAZ»  
«TRANSGAZ» S.A.  
«Bulgartransgaz» EAD  
«DESFA» S.A.

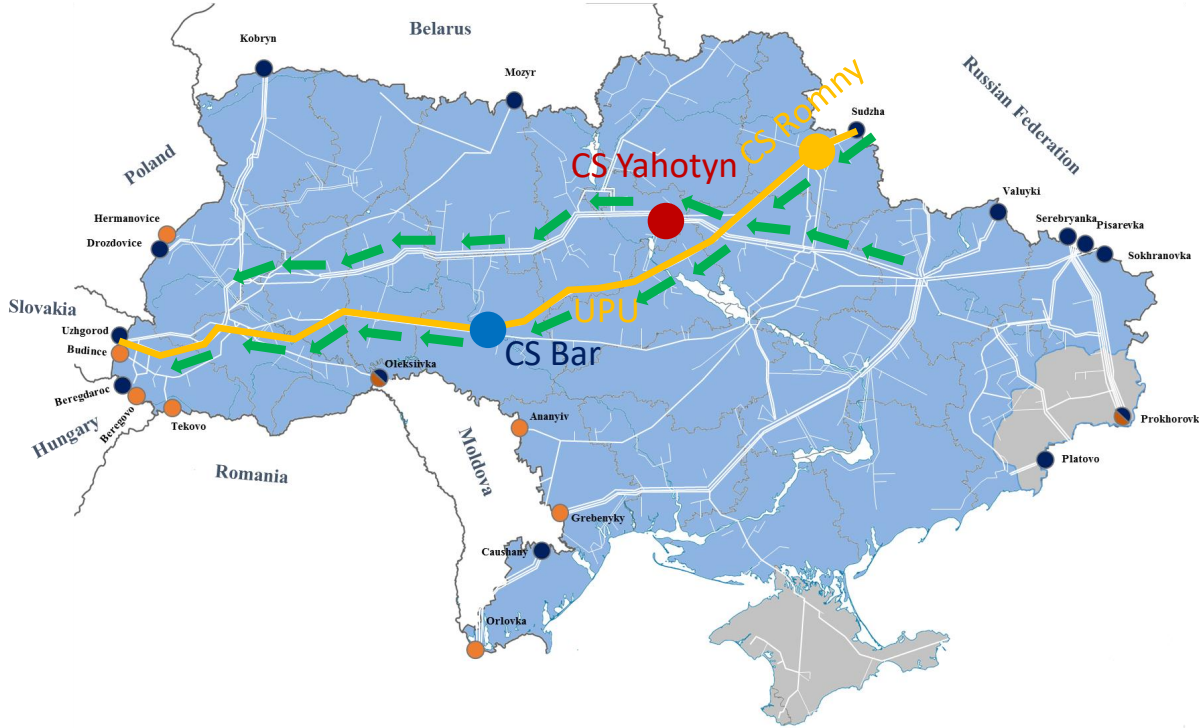
**RO-UA:** 8 bcm




**UA-RO:** 26.8 bcm

**Commissioning:** 2019



# Renovation projects: main projects



<p><b>Thorough overhaul of UPU Urengoi Pomary Uzhgorod</b></p> 	<p><b>Reconstruction of compression station Bar</b></p> 	<p><b>Reconstruction of compression station Yahotyn</b></p> 
<p><b>Schedule: 2016 – 2020</b></p> <ul style="list-style-type: none"> <li>• Reconstruction of linear parts</li> <li>• Reconstruction of CS Romny</li> </ul>	<p><b>Schedule: 2016 – 2020</b></p>	<p><b>Schedule: 2019 – 2021</b></p>

- **Reconstruction and renovation:** linear parts, compression stations, metering stations and gas distribution stations
- **Modernization and digitization of the transmission system**