

Slovak Gas Market

Main characteristics and its role in European gas transmission

Pavol Malickay

Business Development and Commodity
Management

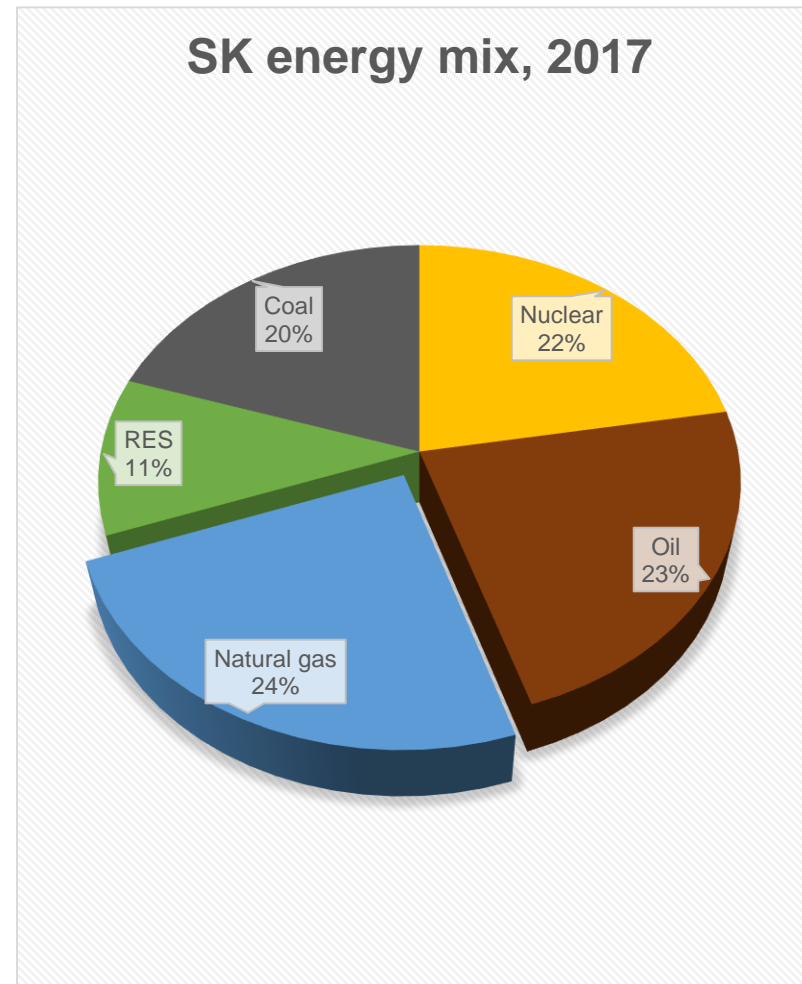
September 2019

Agenda

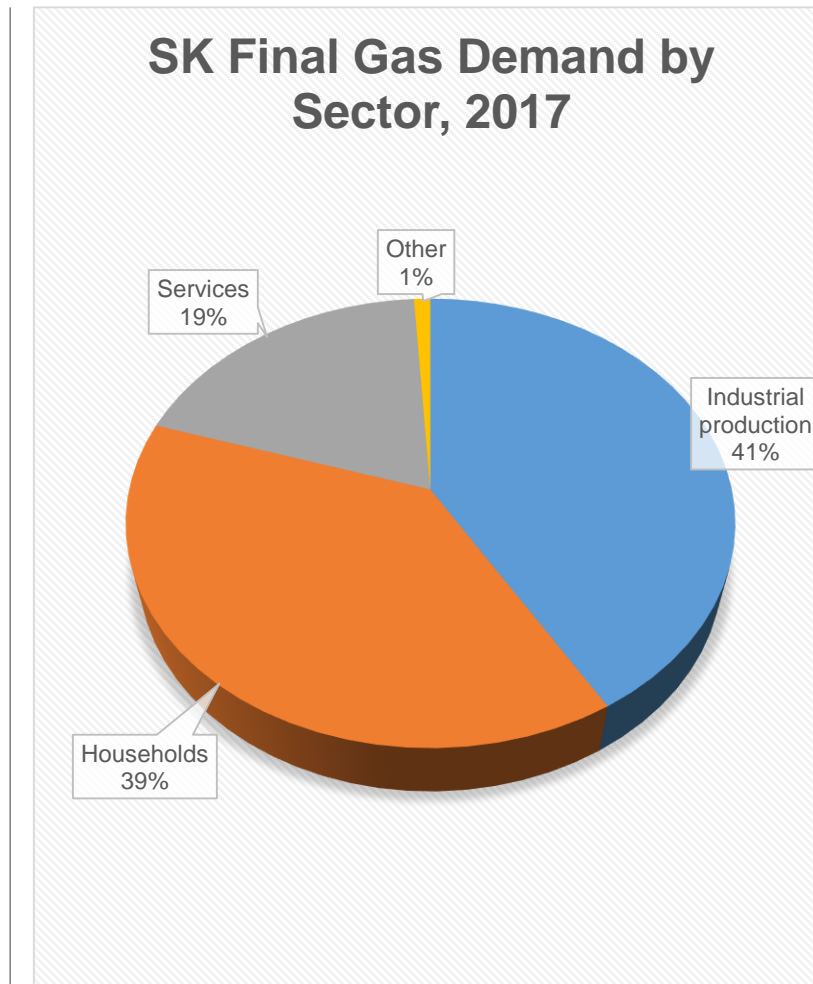
- Slovak gas market
- Gas transmission system in Slovakia
- Development of the Slovak transit route
- Principal gas flows

Importance of gas in Slovakia

- High importance of natural gas as fuel
- Nuclear contribution to rise after 2020
- Slovak industry very gas-dependent



Source: National report of Slovak Republic, 2019



Source: Statistical Office of the Slovak Republic, Energetika

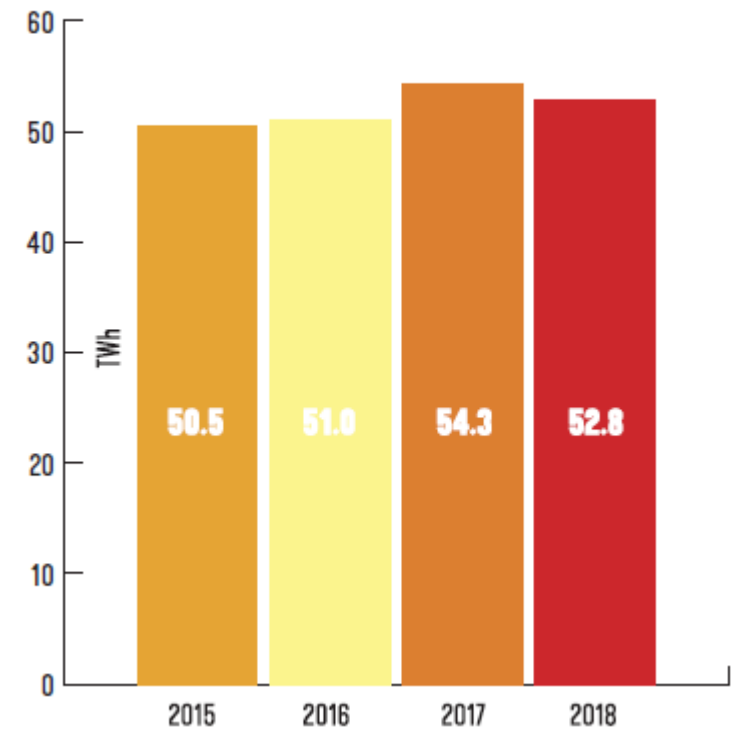
Slovak gas market – key facts 2018

- **Domestic consumption**
- Average daily consumption
- Maximum daily consumption
- **Domestic production**
- **International transit**
- Pipeline length total
- Transmission system operator
- Distribution system operator
- Underground storage operators

- **52.8 TWh = 5 bcm/y**
- 135 GWh = 12.8 mcm/d
- 343 GWh = 32.5 mcm/d
- **0.95 TWh = 0.09 bcm/y**
- **630.4 TWh = 59.7 bcm/y**
- 35 690 km
- Eustream, a.s.
- SPP – distribúcia, a.s.
- Nafta, a.s. and Pozagas, a.s.

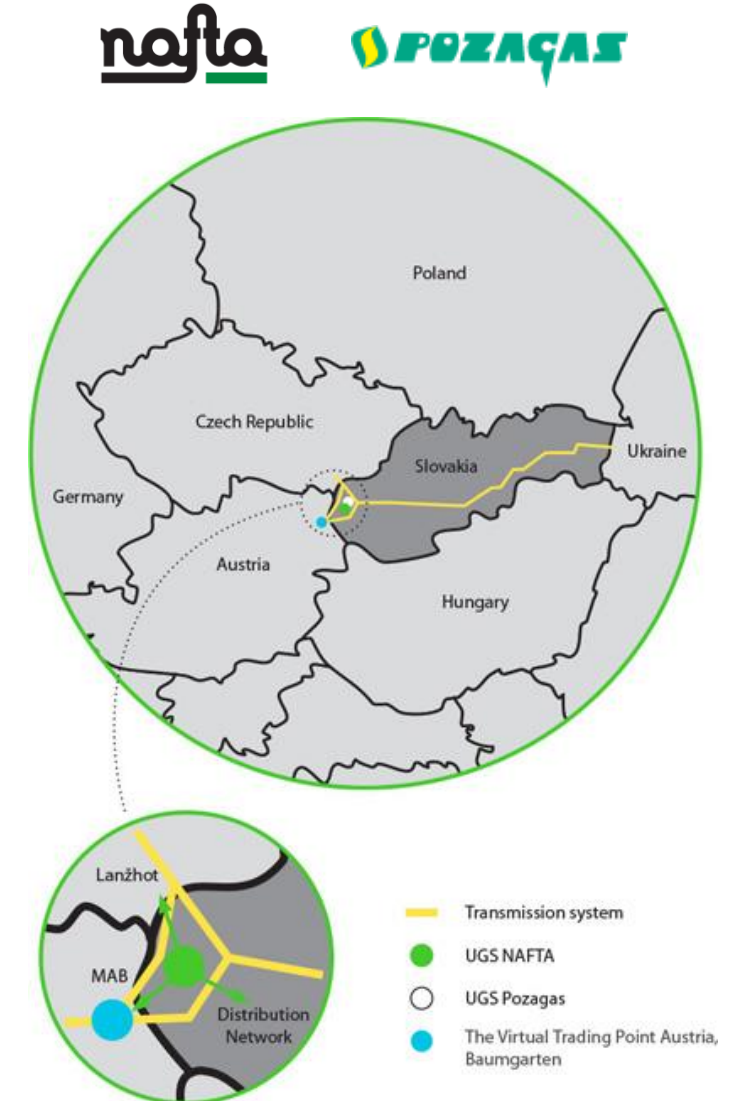
Domestic gas consumption

Gas consumption in TWh



Underground gas storages

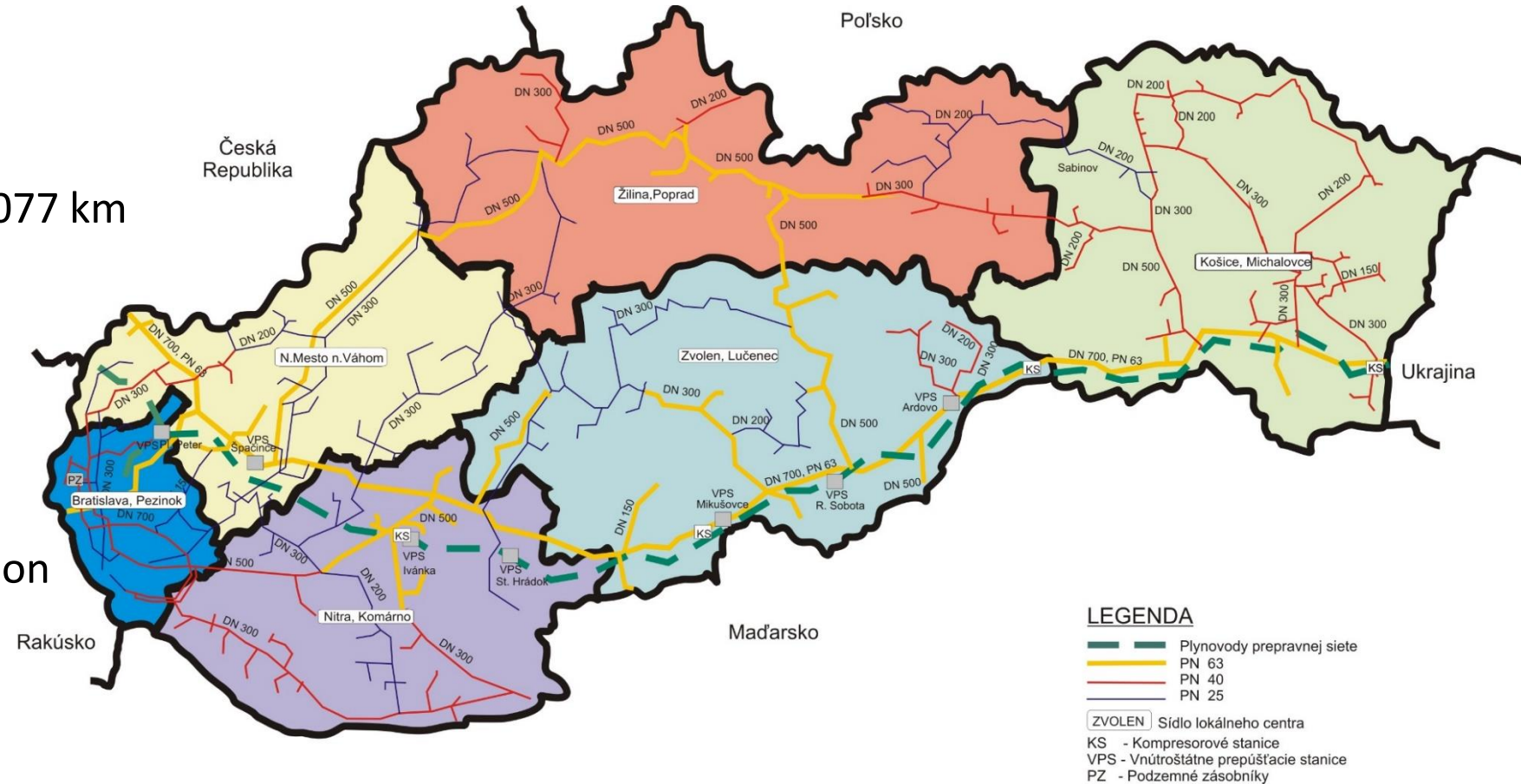
- Nafta, a.s. and Pozagas, a.s. - two underground storage operators
- Technical working volume: 3.72 bcm
- Tech. injectability: 38.72 mcm/d
- Tech. withdrawal capacity: 43.81 mcm/d
- Additional 0.57 bcm UGS in Czech Republic
- Operated by SPP Storage s.r.o.
- Used for balancing of distribution network



Distribution system



- SPP – distribúcia, a.s. - distribution system operator
- Distribution network: total length 33 358 km
 - High pressure: 6 281 km
 - Mid & low pressure: 27 077 km
- High gas infrastructure penetration
 - Reaches 94% of population

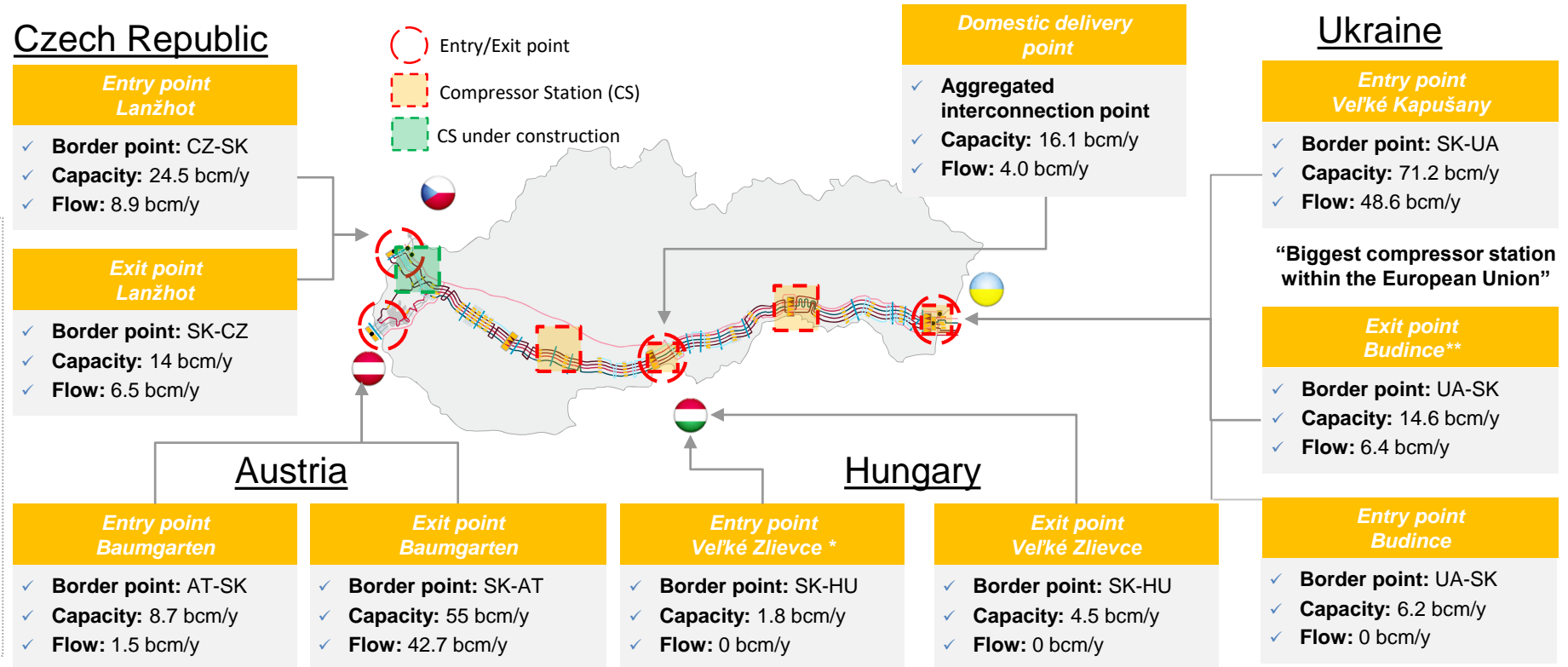


Transmission system



Eustream – Slovak Gas TSO

- ❑ Sole gas TSO in Slovakia
- ❑ Owner of all transmission infrastructure
- ❑ Almost one third of the European import capacity from Russia. The largest and most used natural gas import route to Ukraine from Western Europe
- ❑ Fully compliant system operator in the EU regulatory environment
- ❑ Successfully implemented all EU Network Codes



Modern infrastructure

- ❑ Technical capacity ca. 90 bcm/y, 78 bcm/y in the East-West direction
- ❑ Sizeable transported volume (60 bcm of gas transported in 2018)
- ❑ Cross-border connections with Ukraine, the Czech Republic, Austria and Hungary
- ❑ All EU entry/exit cross-border points support physical reverse flow
- ❑ Five/four parallel pipelines 56"/48" (2,273 km in Slovakia)
- ❑ Four compressor stations (Power output ~ 500 MW)
- ❑ All infrastructure is fully owned

Source: Company Information
 Note: Capacities as of July 2019, Flow in 2018
 Budince Entry capacity available from 4/2016

* Only interruptible capacity
 **Capacity partially interruptible

Slovakia – gas transmission country

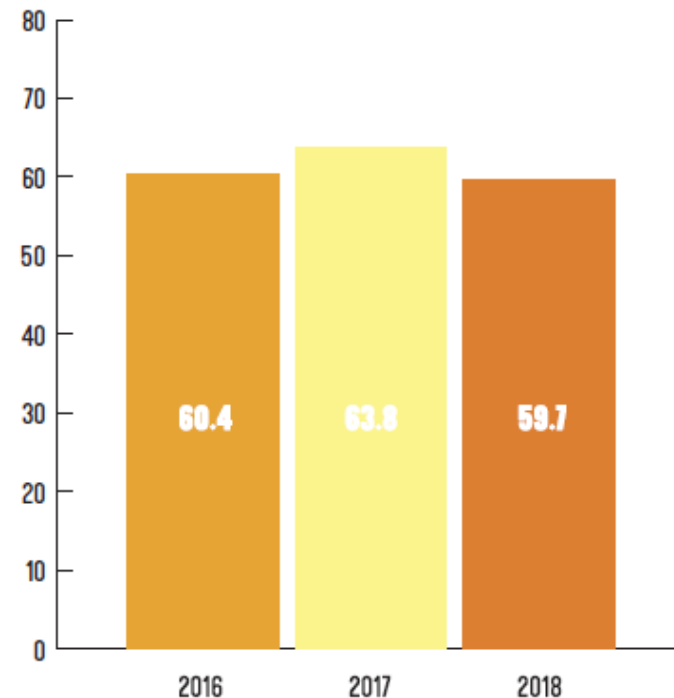
- Eustream transported 59.7 bcm of gas in 2018
- Only 5 bcm, i.e. 8.4% of the total volume was gas for domestic users



- 92% of gas transported in Slovakia is for international transmission

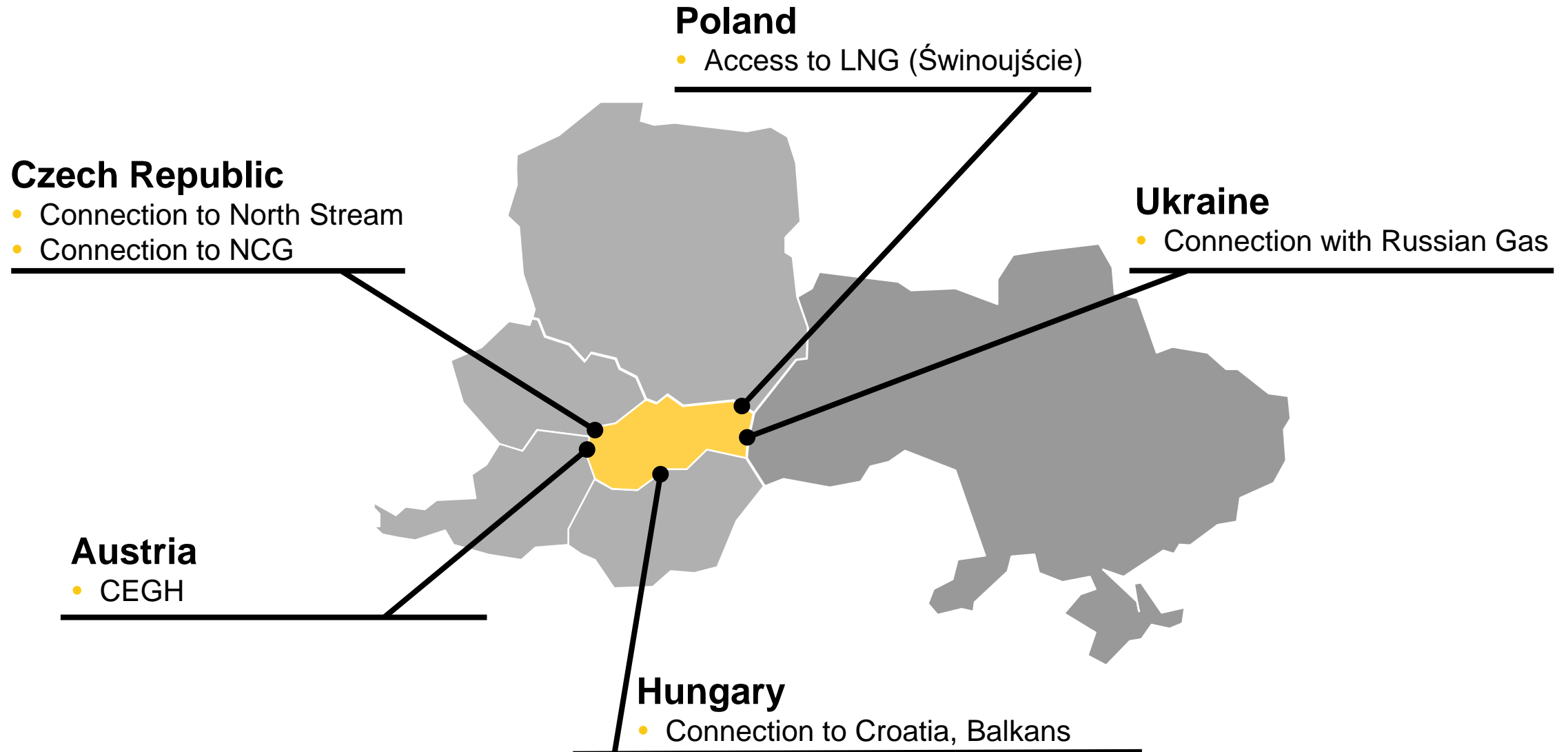
International gas transmission

Gas transmission volume in bcm



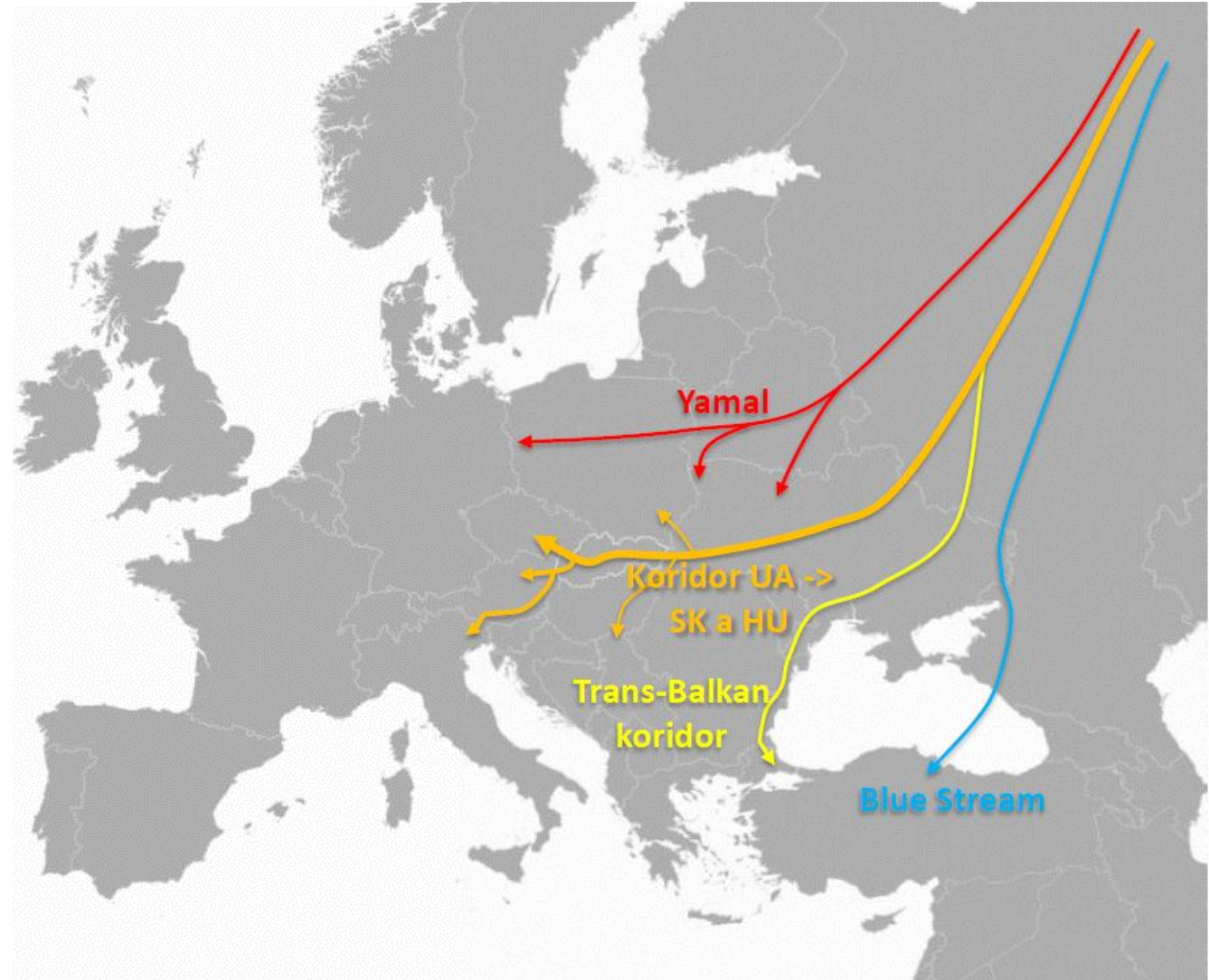
Source: Regulatory Office for Network Industries, Annual report 2018

Gas Crossroads of Central Europe



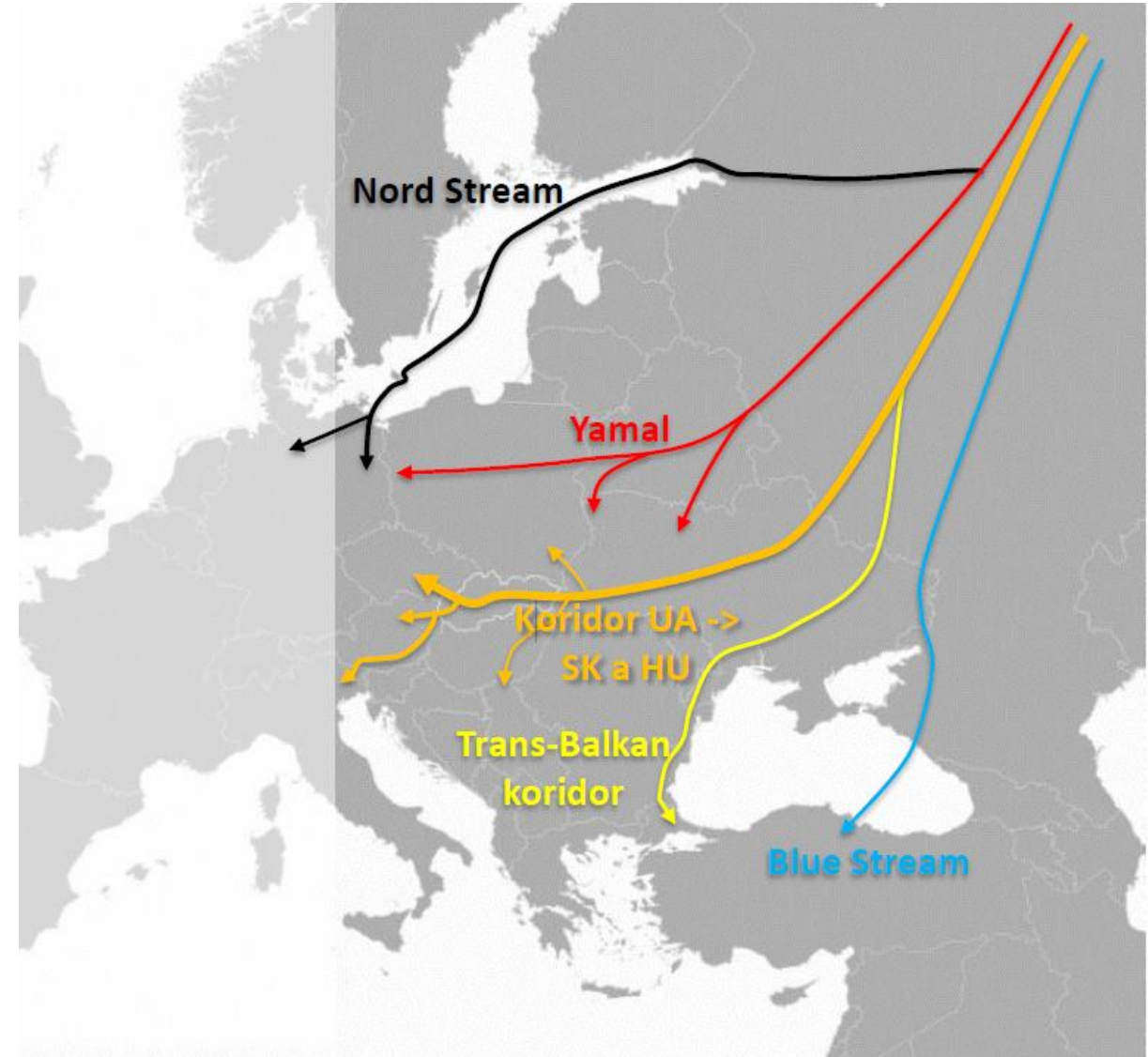
Historical context of the Slovak transit route

- UA -> SK & HU route
 - Commissioning: 1972
 - Technical capacity:
 - Before Nord Stream: 130 bcm/y
 - Currently: 92 bcm/y



Historical context of the Slovak transit route

- Trans-Balkan route (UA)
 - Commissioning: 1974
 - Technical capacity: 25 bcm/y
- Yamal
 - Commissioning: 1997
 - Technical capacity: 33 bcm/y
- Blue Stream
 - Commissioning: 2003
 - Technical capacity: 16 bcm/y
- Nord Stream
 - Commissioning: 2011
 - Technical capacity: 55 bcm/y

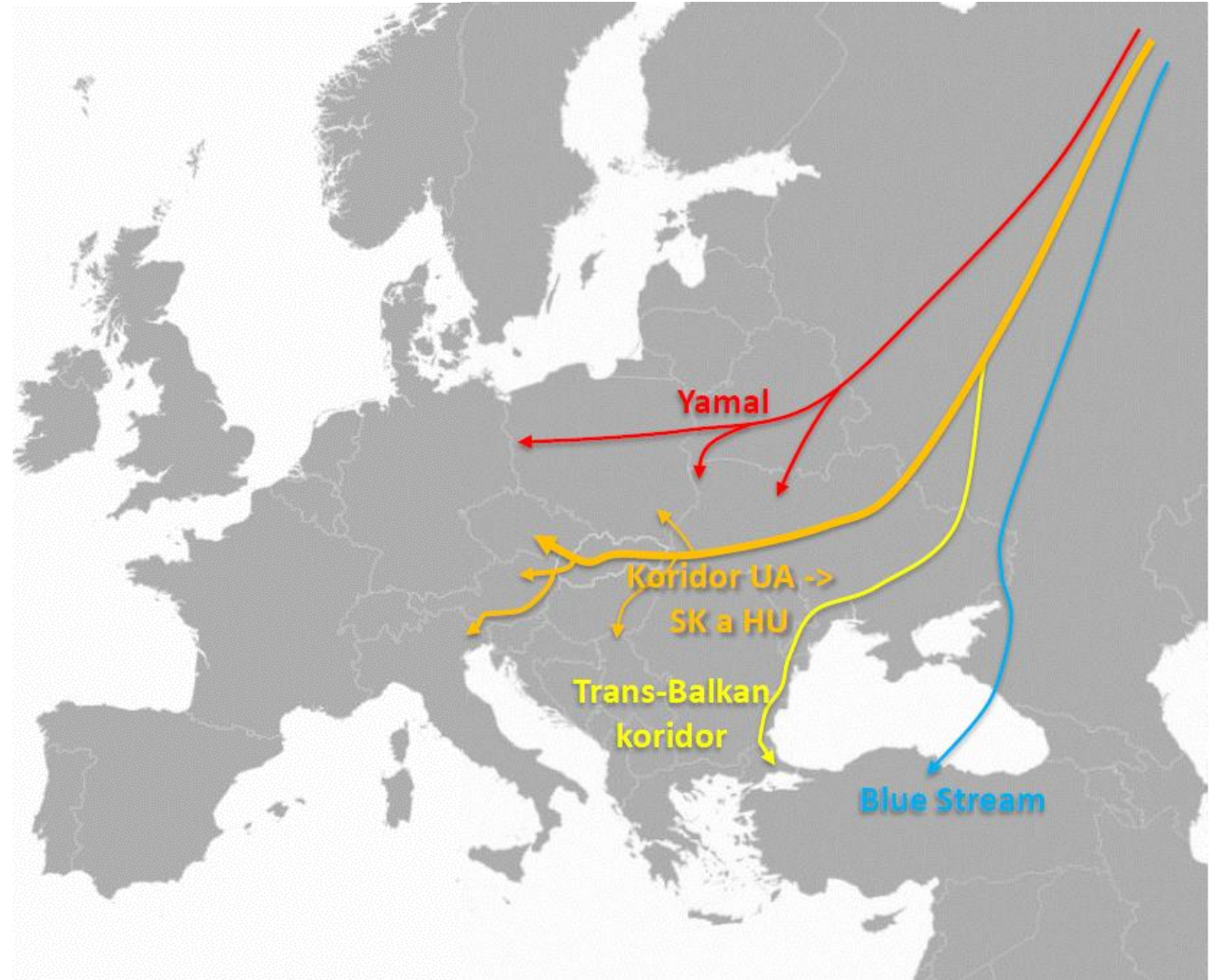


Transmission systems before 2009

- National networks developed around main transmission routes
- Missing north-south interconnections
- Limited flexibility of transmission systems in terms of reverse flows
- Almost no demand for transmission in reverse flow

Gas Crisis 2009 – driver of change

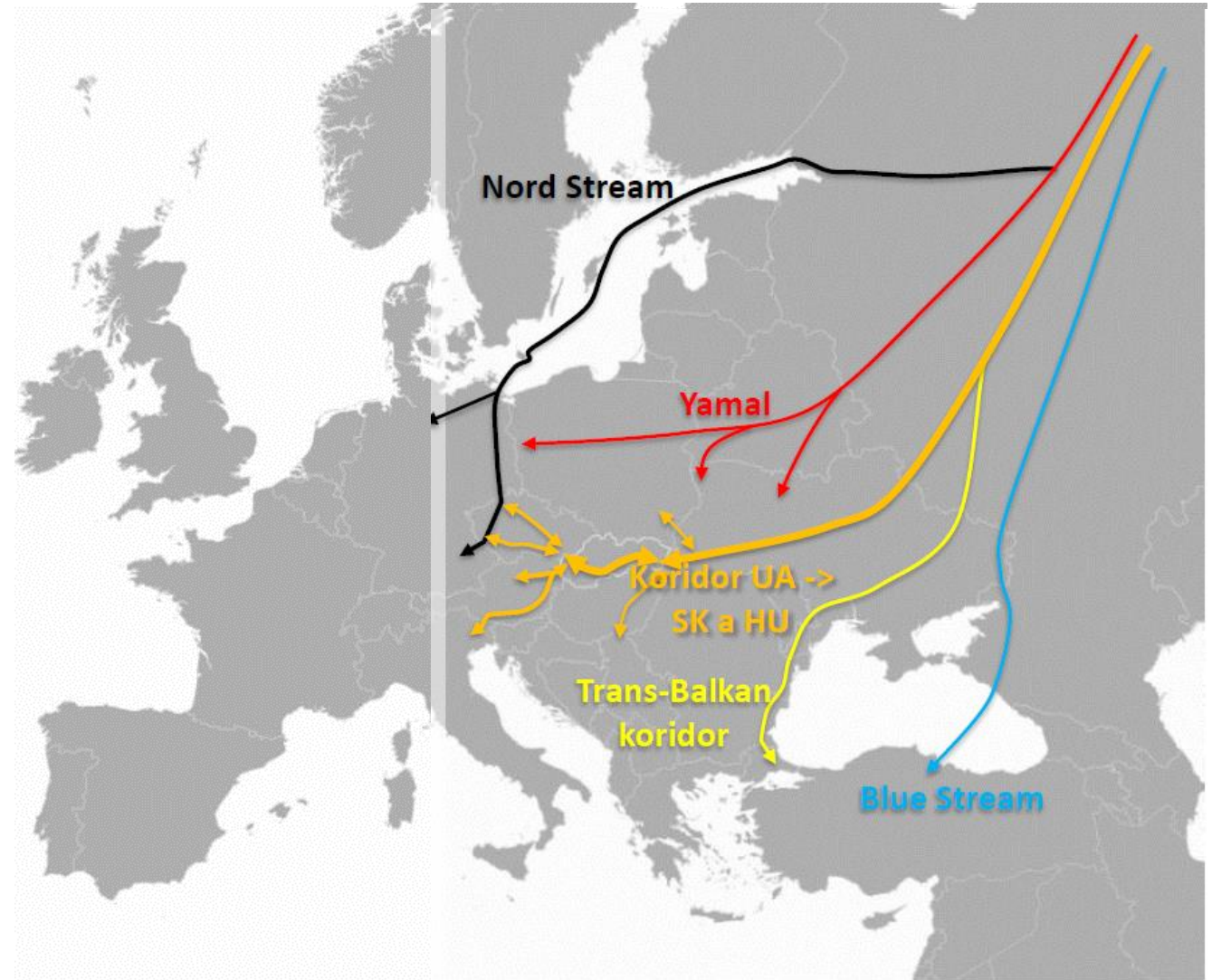
- Transmission via Ukraine stopped
- Limited-to-no access of Central European and Eastern European countries to gas supplies



Transmission systems after 2009

What we've been doing:

- Upgrading our transmission network to allow reverse flows with every neighbouring country
 - CZ- Lanžhot (2010)
 - AT - Baumgarten (2011)
 - HU - Veľké Zlievce (2015)
 - UA - Budince (2016)
 - PL - PL-SK (2021)
- Development of north-south interconnections
 - HU-SK interconnector (2015)
 - PL-SK interconnector (2021)
- Result:
 - Shippers will be able to reach northern and southern markets of Central and Eastern Europe
 - Future availability of LNG gas (Świnoujście and potentially Krk LNG terminals)
 - **Increased security of supply**

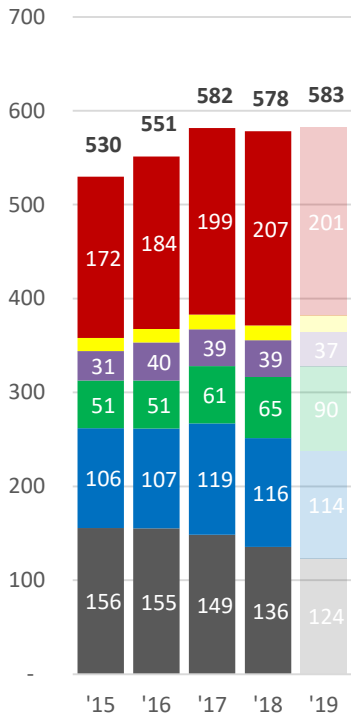


Agenda

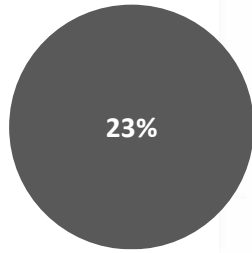
- Slovak gas market
- Gas transmission system in Slovakia
- Development of the Slovak transit route
- **Principal gas flows**
 - European Natural Gas Demand / Sourcing
 - Final destination markets of gas transmitted by Eustream
 - Direction of flows within Slovakia
 - Expected SK flows in 2019

European Natural Gas Demand / Sourcing

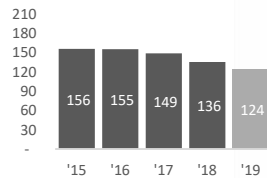
EU Natural Gas Sourcing



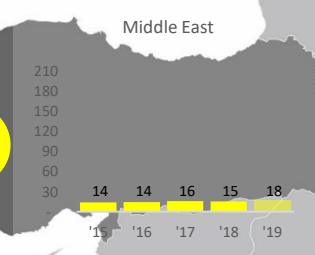
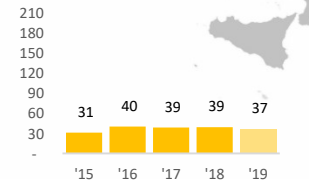
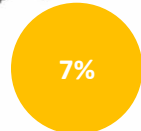
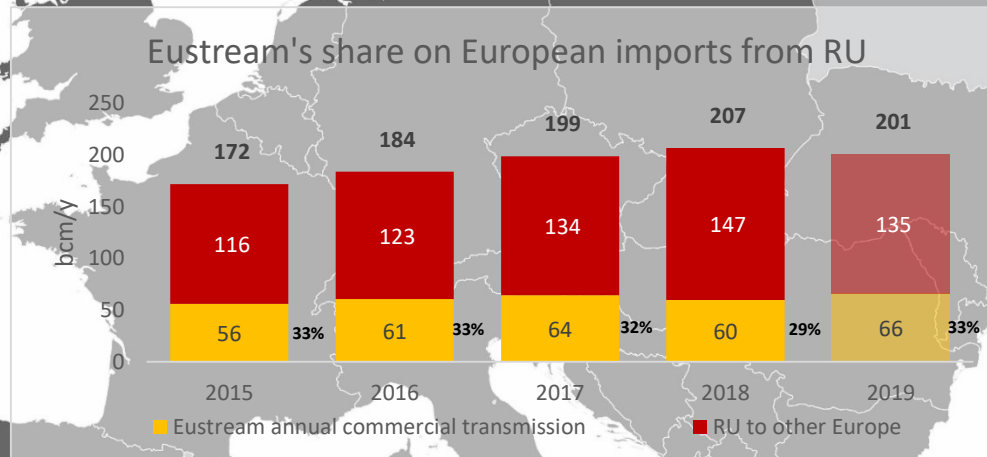
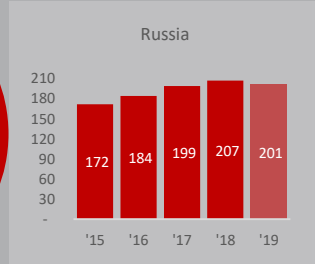
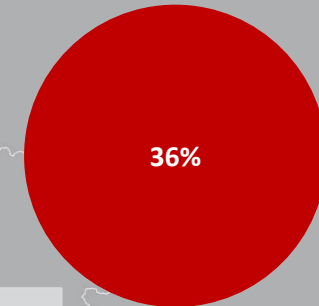
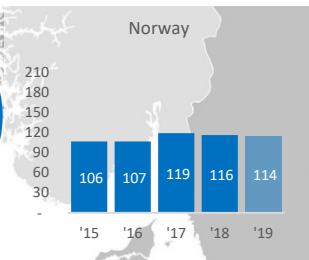
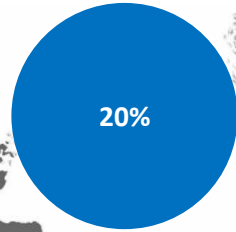
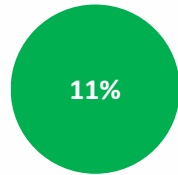
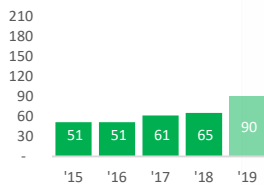
- Russia
- Middle East
- North Africa
- LNG
- Norway
- Indigenous Prod.



Indigenous Prod.



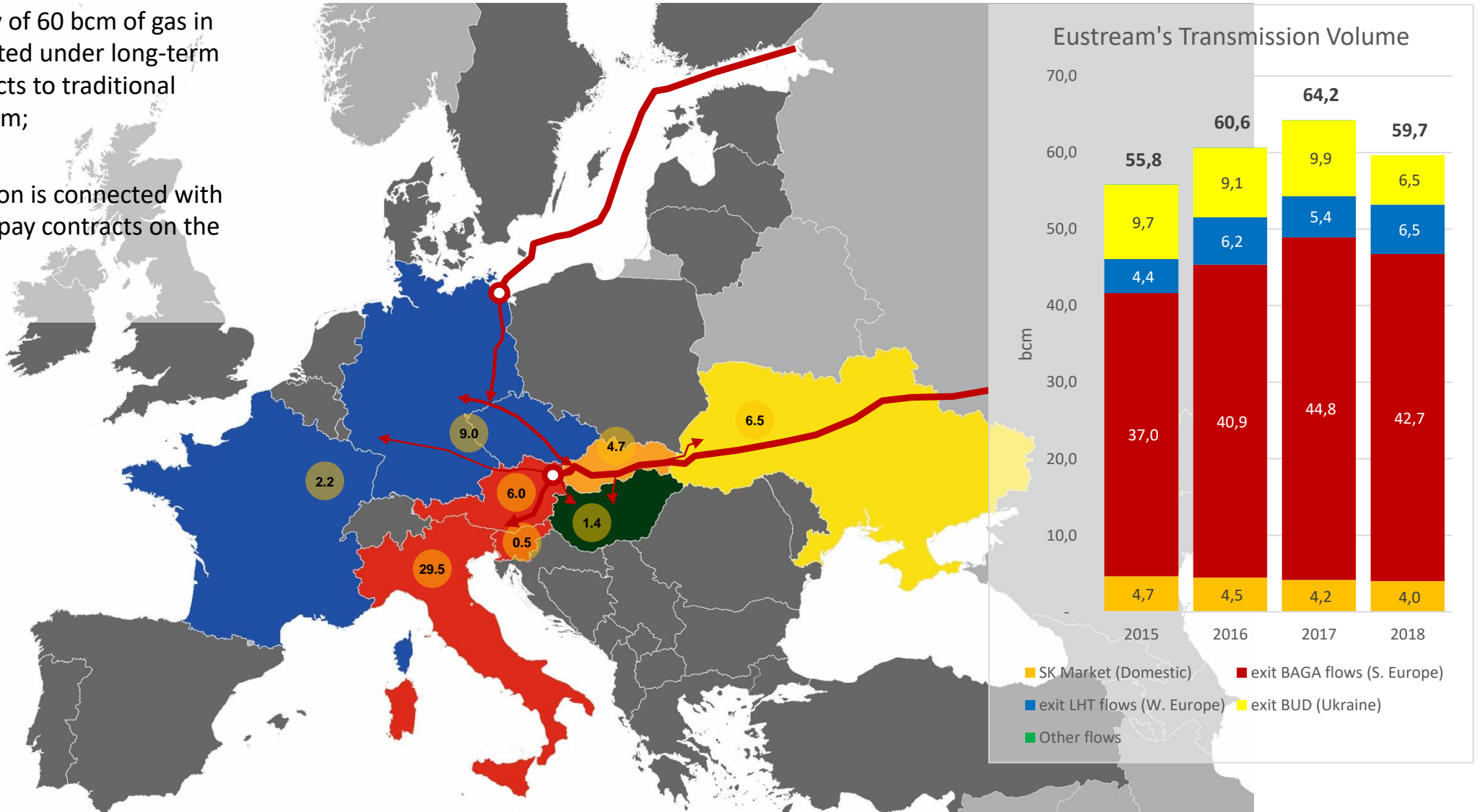
LNG



Pozn.:
 Rok 2019, interné údaje EUS, údaje v bcm s GCV 10.48 @ 20,0 °C
 Európa zahŕňa: EU28, CH, BA, MK, MO, RS, TR, UA

Final destination markets of gas transmitted by Eustream

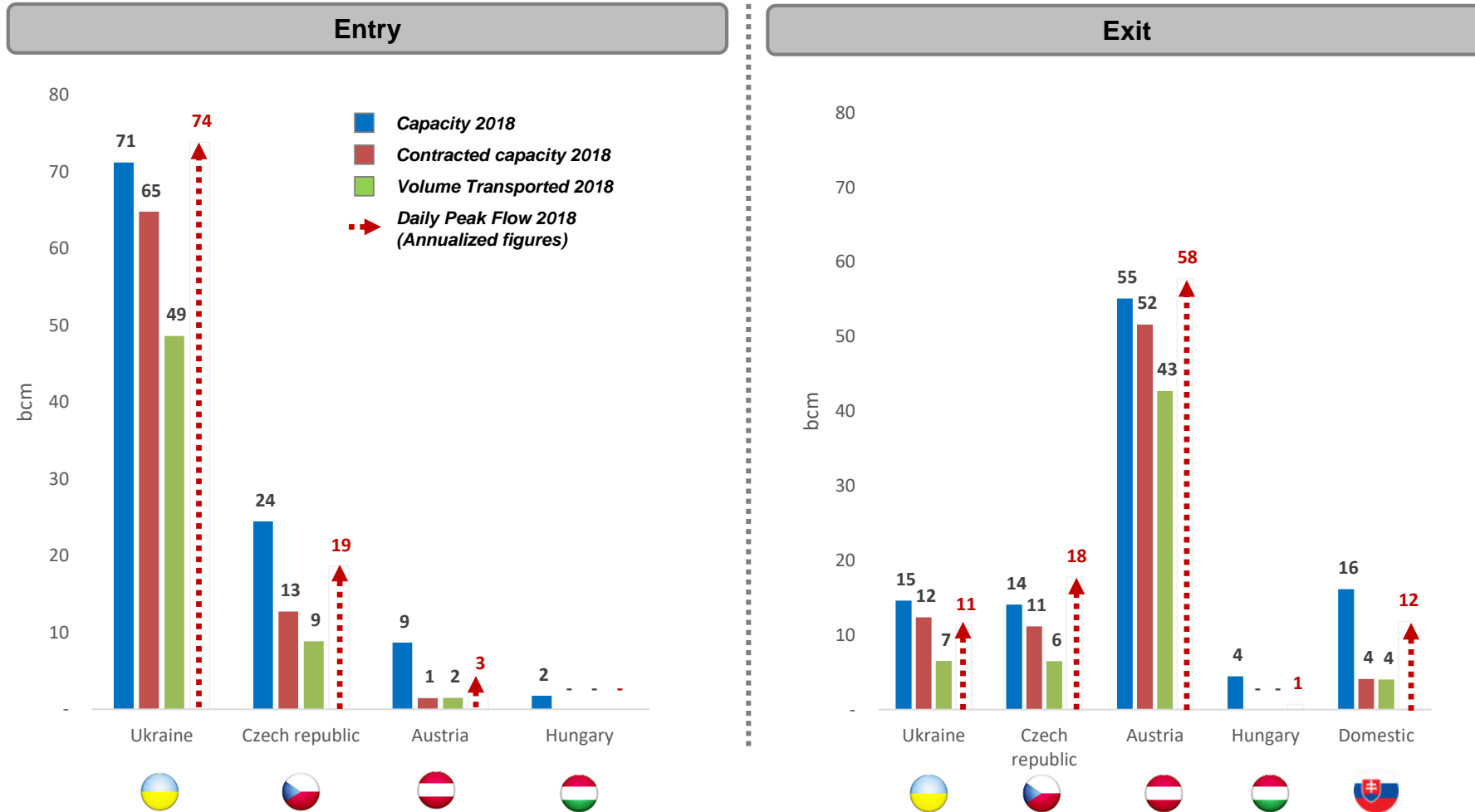
- Dominant majority of 60 bcm of gas in 2018 was transmitted under long-term ship-or-pay contracts to traditional markets of Eustream;
- Volume transmission is connected with long-term take-or-pay contracts on the supply side;



Transmitted volume in bcm by final destination (Eustream estimate, 2018)

Flows by Route and Entry / Exit Points to / from Slovakia

Capacity and volumes by entry/exit point (bcm/y) 2018



Notes:

Annualized daily peak flow maximum of the year 2018.

Entry VK and exit BAGA peak flow exceeding maximum firm technical capacity is caused by sold interruptible capacity.

Conclusions

- Eustream believes that main gas flows through Slovakia will continue in the East-West direction in the coming years
- Slovak economy highly dependent on gas through industrial production
- In Slovakia natural gas will keep its importance as fuel
- Security of supply and diversification of supply sources are crucial goals of Eustream regarding its transmission network
- Baltic pipe, Świnoujście LNG terminal and PL-SK interconnector are vital projects that greatly help us achieve our goals

eustream, a.s.
Votrubova 11/A
821 09 Bratislava
www.eustream.sk



Thank you for your attention.