

# **TYNDP 2017**

## **Supply potentials**

**System Development Area**



# Introduction



## 1. Conventional & Unconventional production (Shale Gas & Biogas)

- Use of TSO figures for system assessment

## 2. Import sources:

- Algeria, Azerbaijan, Libya, LNG, Norway and Russia
- Aligned minimum supply assumptions for supply adequacy and assessment
- The modelling always respects supply ranges between the minimum and the maximum for every source
- Different assessment approach for 2017 (“tomorrow as of today”) and the other modelled years 2020, 2025, 2030, 2035 (supply potentials)

## 3. Potential import sources not directly used in the assessment:

- Egypt, Iran, Israel and Turkmenistan



# Indigenous production

## > Conventional production

- **TSO data** for existing production
- Potential inclusion of new (Non-FID) production (Black Sea)
- Other potential new sources (Cyprus)
- ➡ Quantification during data collection periods

## > Unconventional production

- Differentiation between uncertain potential scenarios and the assessment
- Help transparency by showing analysis
- Use of **TSO data** for TYNDP assessment

## > Biomethane

- Keep detailed analysis of biogas and biomethane potentials for information and transparency purpose
- Use of **TSO data** for TYNDP assessment (aligned with the green ambition in each scenario)



# 2017: supply assumptions

## *Indigenous Production*

- Use of TSO figures

## *Imports*

- Reasonable range for Algeria, Libya, LNG, Norway and Russia reflecting current market situation
- **Maximum:** Use of the maximum of Summer Supply Outlook 2016 (with a ratio of 183 of 365) and the maximum of Winter Supply Outlook 2015/16 (with a ratio of 183 of 365) for each source.
- **Minimum:** Use of the minimum yearly supply observed in the calendar years 2009-2015 for each source. For Libya 2011 is disregarded.

*The modelling assumptions for 2017 differ from the other modelled years.*

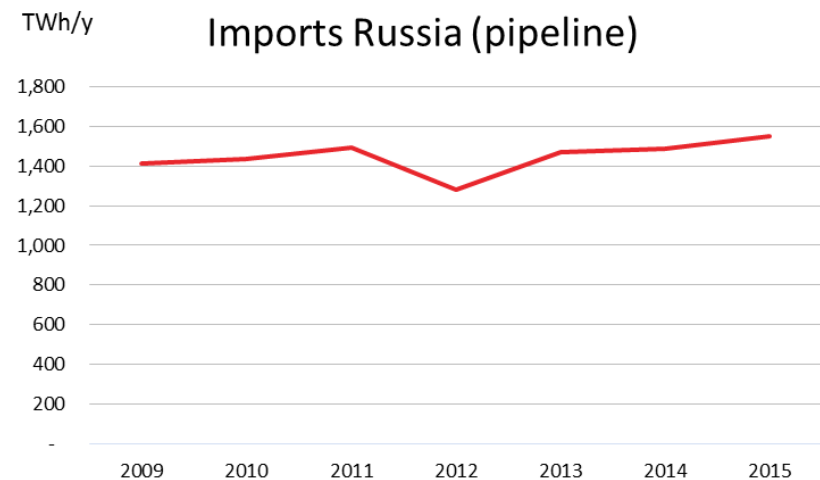


# Russia: Import routes and history

## *Three main pipelines:*

- **Nord Stream:** twin offshore pipeline, 1,220 km between Vyborg (Russia) and Greifswald (Germany), **55 bcma**
- **YAMAL-Europe:** 2,000 km to Poland and Germany via Belarus, **33 bcma**
- **Brotherhood (Urengoy-Ushgorod pipeline):** Transit through Ukraine to Central, Western, and Southern European countries and Turkey, **100 bcma**

According to Gazprom Export website



*Main gas supplier of the EU with the second largest proven gas reserves in the world.*

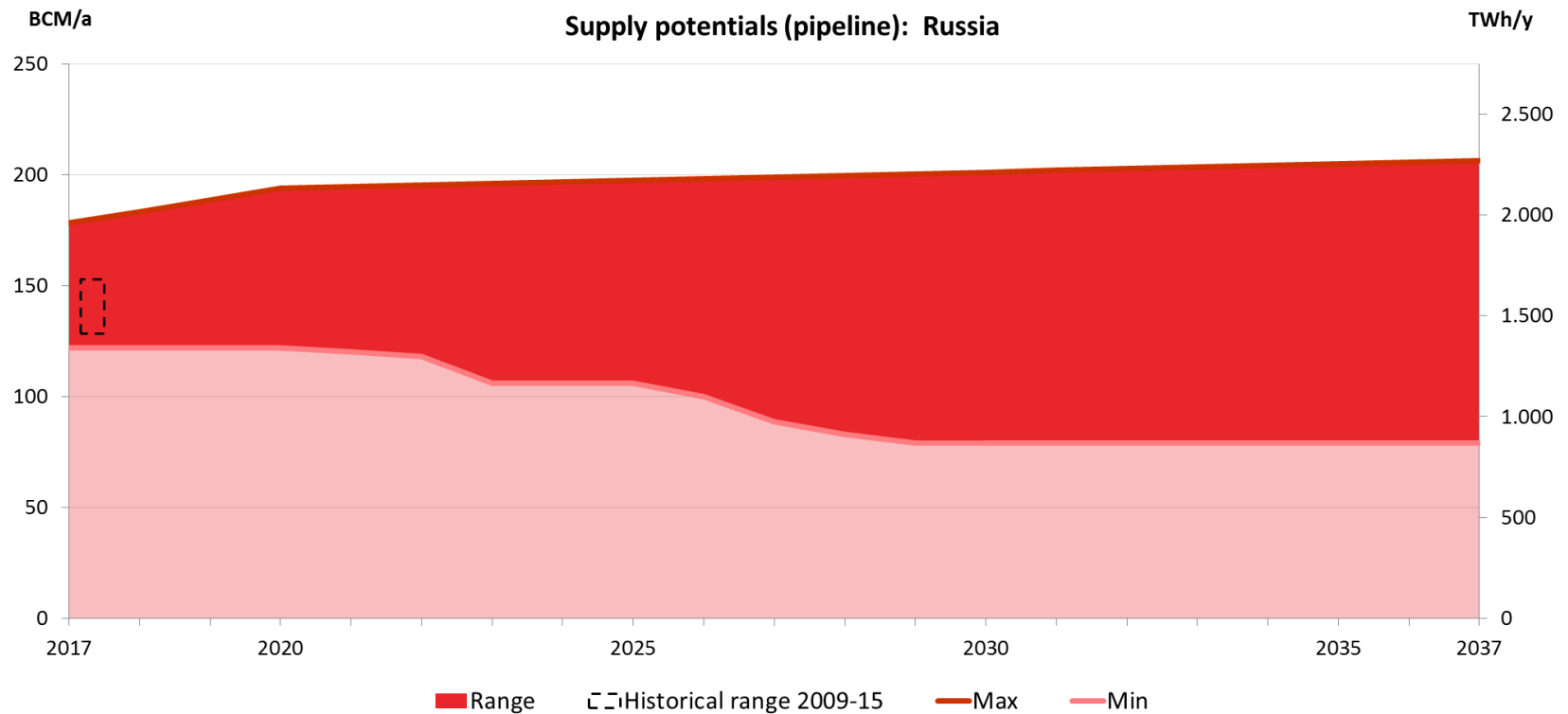


# Russia: Supply potentials TYNDP 2017



Pipeline Gas Supply Potential for Russia						
bcma	2017*	2020	2025	2030	2035	2037
Maximum	160	194	198	201	205	206
Minimum	118	122	106	79	79	79

\* tomorrow as of today



Source Max: "Gas exports to EU" (Institute of Energy Strategy. Gromov 2011)

Source Min: "The Political and Commercial Dynamics of Russia's Gas Export Strategy" (Oxford Institute for Energy Studies, James Henderson & Tatiana Mitrova, September 2015)



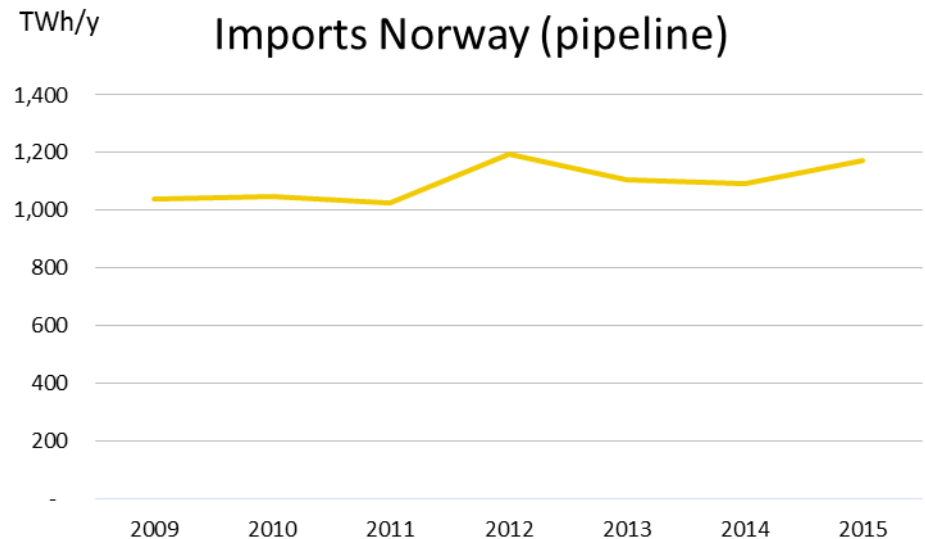
# Norway: Import routes and history



## EXPORT CAPACITY OF THE GASSCO OFFSHORE SYSTEM

Pipeline	Country	Capacity (Million sm <sup>3</sup> / d)
Europipe	Germany	46
Europipe II	Germany	71
Franpipe	France	55
Norpipe	Germany, the Netherlands	32
Tampen Link	UK	10-27
Vesterled	UK	39
Zeepipe	Belgium	42
Langeled	UK	72-75
Gjøa Gas Pipeline	UK	17

According to Gassco website



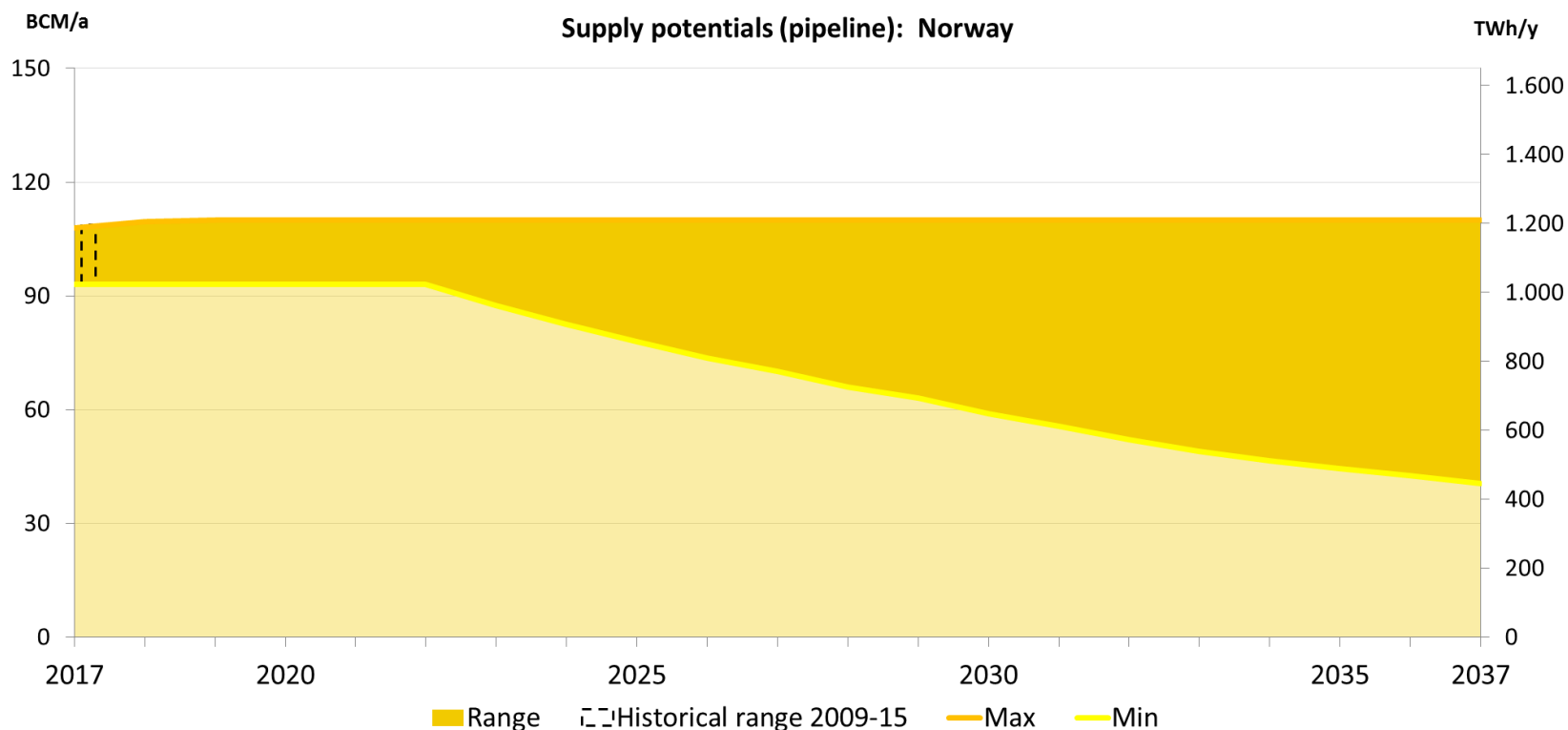
*Second largest gas supplier of the EU, supplying Europe for over 40 years.*

# Norway: Supply potentials TYNDP 2017



Pipeline Gas Supply Potential for Norway						
bcma	2017*	2020	2025	2030	2035	2037
Maximum	112	110	110	110	110	110
Minimum	95	93	78	59	45	41

\* tomorrow as of today



Source Max: GASSCO: development of annual exports as estimated by Gassco including existing fields, discoveries and yet to find gas fields, kept on the maximum level from 2019 on based on the Gassco experience on production forecasts.

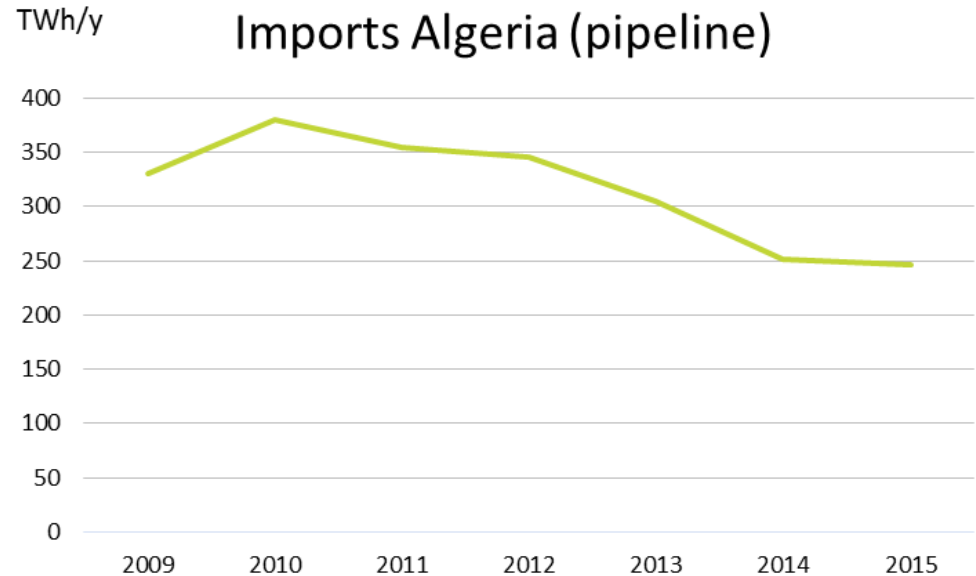
Source Min: Minimum as Minimum of 2009-2014 (93 bcm) and production / sales forecast of resources in existing fields (GASSCO information)



# Algeria: Import routes and history

## *Pipelines:*

- **Pipeline Enrico Mattei (GEM):** 1,650 km from Algeria to Italy via Tunisia, **33 Bcma**
- **Maghreb Europe Gasoduc (MEG) pipeline:** 520 km to Spain via Morocco, **12 Bcma**
- **MEDGAZ pipeline:** 200 km from Algeria to Spain, **8 Bcma**

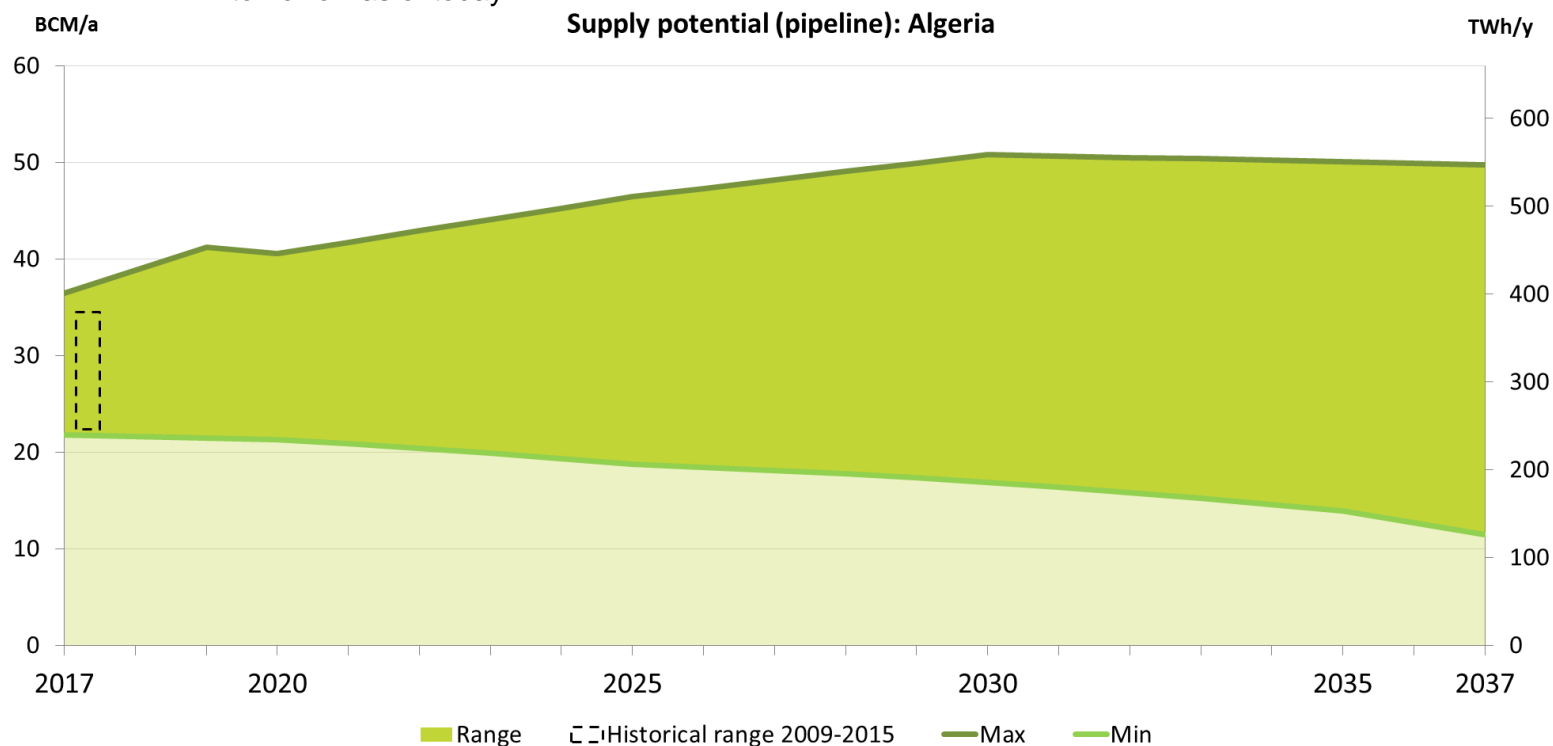


*Third largest gas supplier of the EU, top ten largest gas reserves in the world.*

# Algeria: Supply potentials TYNDP 2017

Pipeline Gas Supply Potential for Algeria						
bcma	2017*	2020	2025	2030	2035	2037
Maximum	34	41	46	51	50	50
Minimum	23	21	19	17	14	11

\* tomorrow as of today

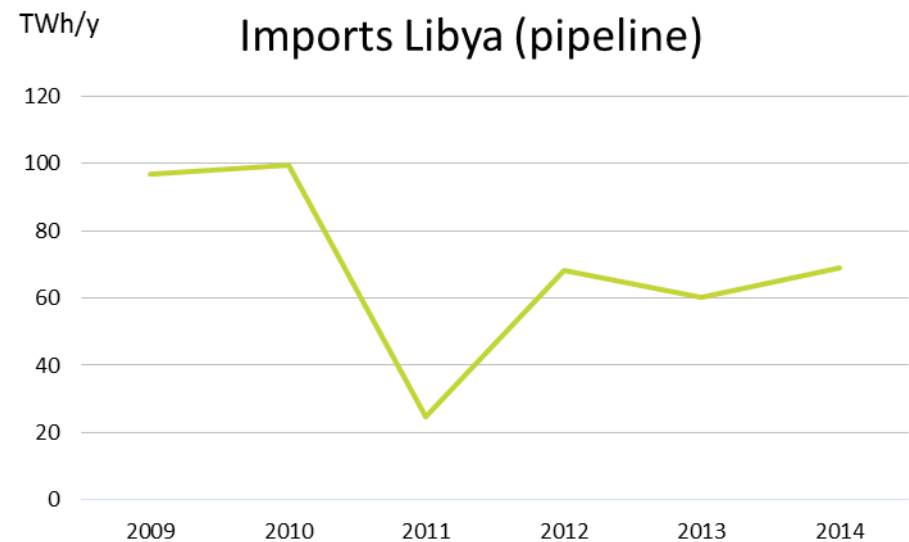


Sources: MEDPRO 2012, BP Statistical Review and IEA WEO 2015

# Libya: Import route and history

## *Pipeline:*

- **Green Stream Pipeline:**  
520 km connecting Libya to Italy via Sicily, **17 Bcma**



*Currently the smallest pipeline supplier of the EU.*

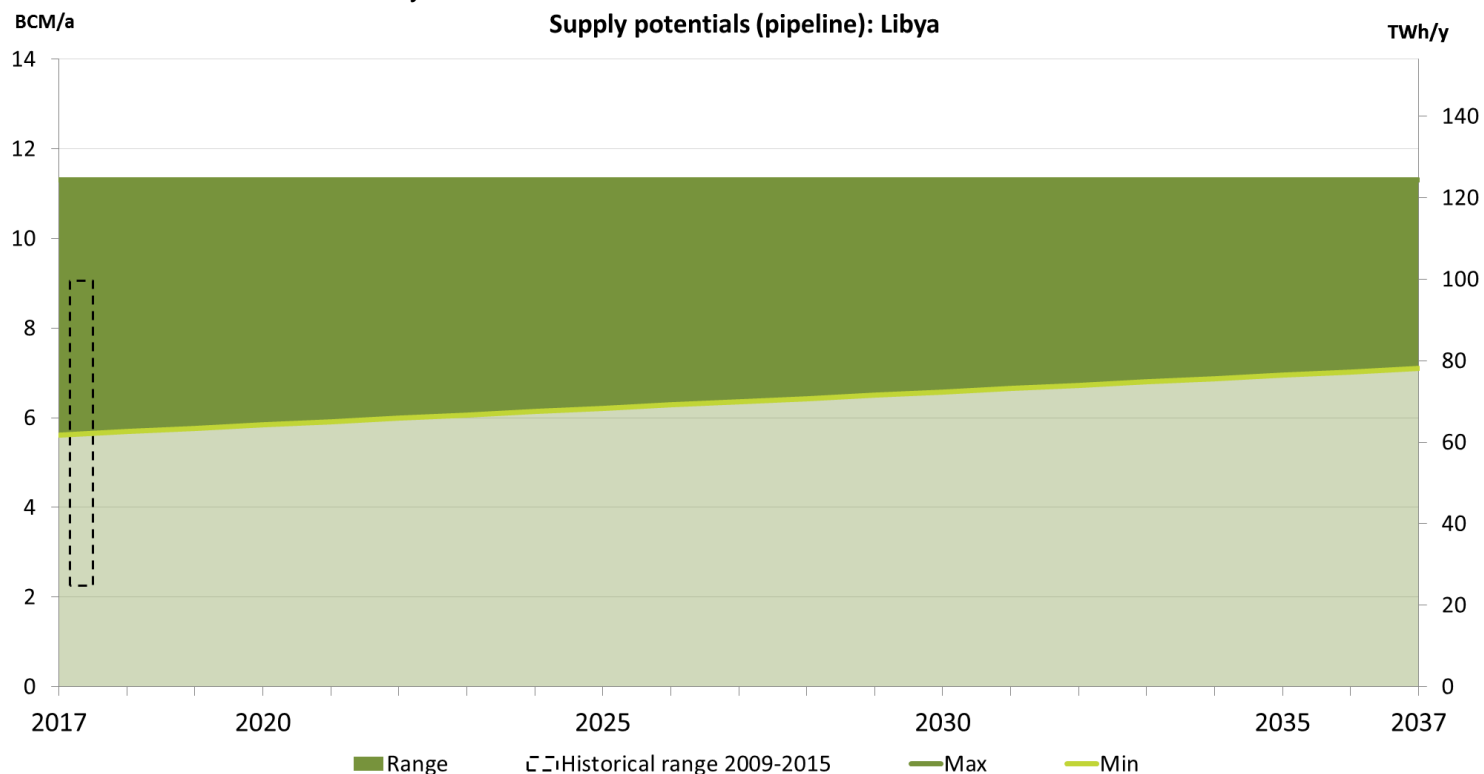


# Libya: Supply potentials TYNDP 2017



Pipeline Gas Supply Potential for Libya						
bcma	2017*	2020	2025	2030	2035	2037
Maximum	8	11	11	11	11	11
Minimum	6	6	6	7	7	7

\* tomorrow as of today

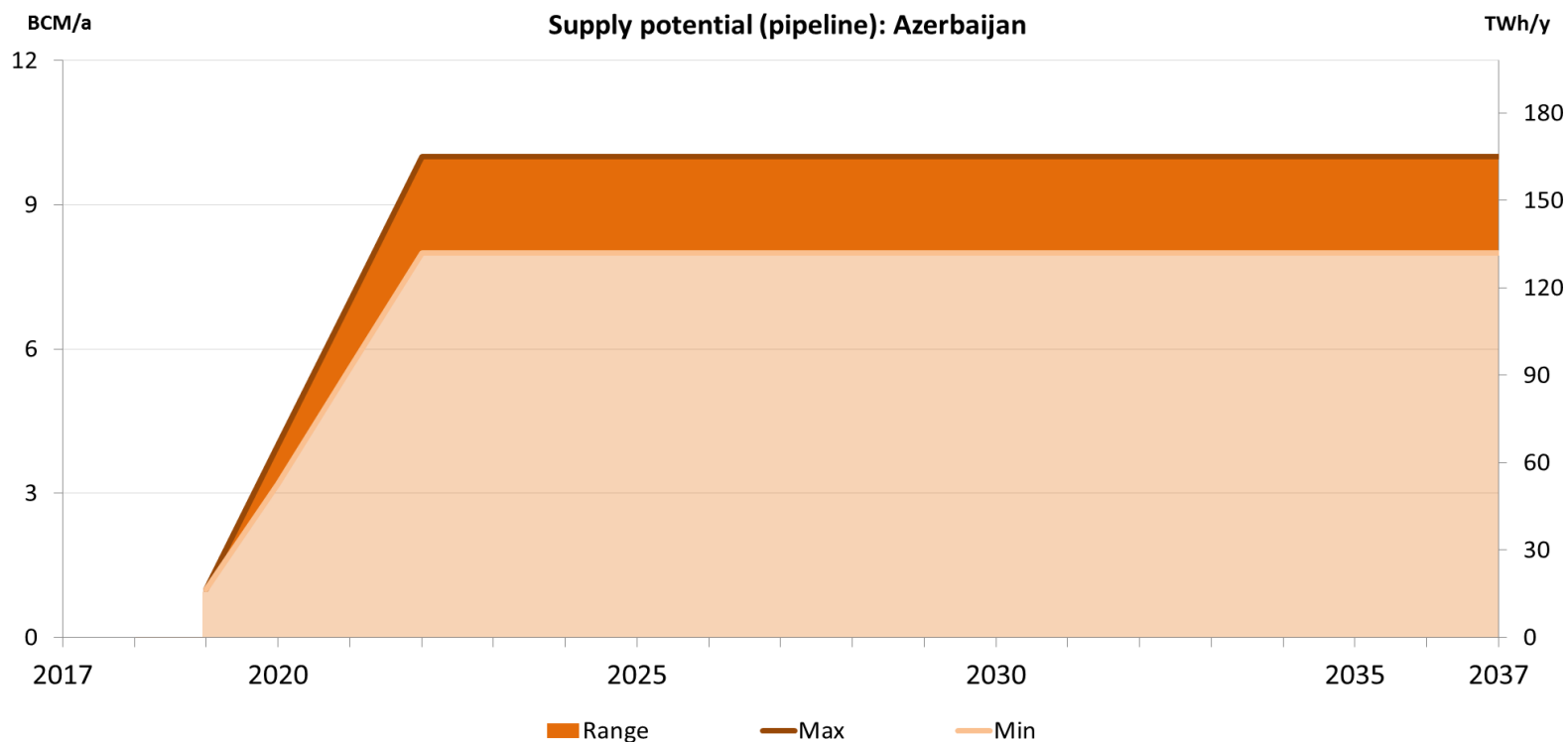


Source Max: 95% load factor of the Greenstream pipeline capacity.

Source Min: Mott MacDonald's report 2010 low case.

# Azerbaijan supply scenarios

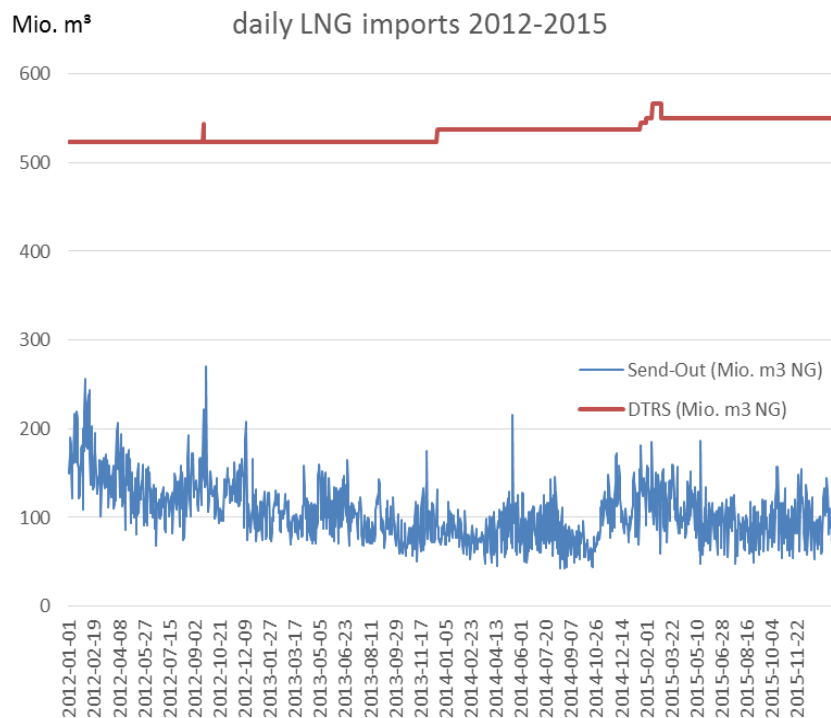
Pipeline Gas Supply Potential for Azerbaijan						
bcma	2017	2020	2025	2030	2035	2037
Maximum	0	4	10	10	10	10
Minimum	0	3	8	8	8	8



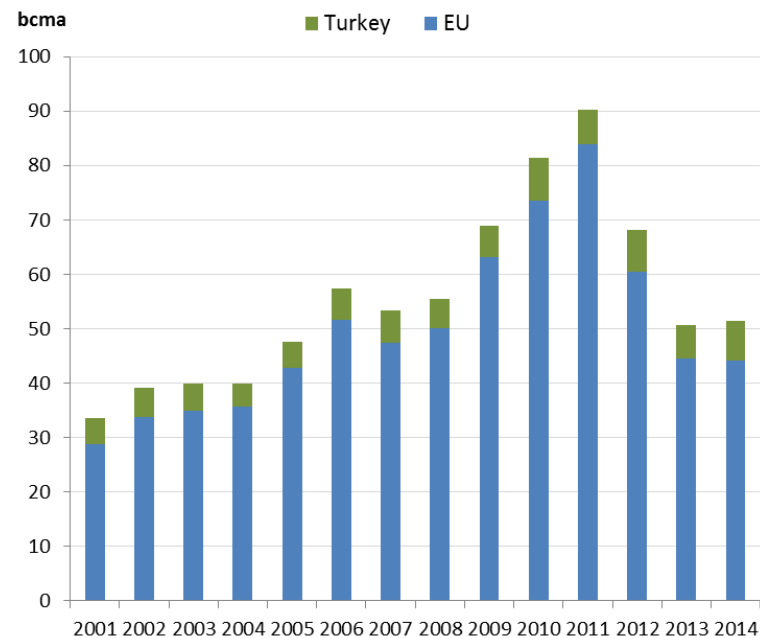
Source Max: contractual figures for TAP.

Source Min: 80% of the max

# LNG import history



Numbers from ALSI platform



Numbers based on BP Statistical Review

*BP SR shows a sustained fall from 2012, stabilized in 2014 to around 44 bcma*

# LNG terminals

- **22 existing terminals**

(Barcelona, Bilbao, Cartagena, Cavarzere (Porto Levante / Adriatic LNG), Dunkerque, Fos (Tonkin/Cavaou), Gate Terminal, Huelva, Isle of Grain, Klaipeda (LNG), Milford Haven (South Hook), Milford Haven (Dragon LNG), Montoir de Bretagne, Mugardos, Musel, OLT LNG / Livorno, Panigaglia, Revythoussa, Sagunto, Sines, Teesside, Zeebrugge LNG)

- **7.8 Mio m<sup>3</sup> LNG Declared Total Maximum Inventory\***

- **550 Mio m<sup>3</sup>/d natural gas Declared Total Reference Sendout\***

\*: From GLE's ALSI platform

## *Operational LNG import points*



*New Polish Świnoujście LNG terminal commissioned in 2016*

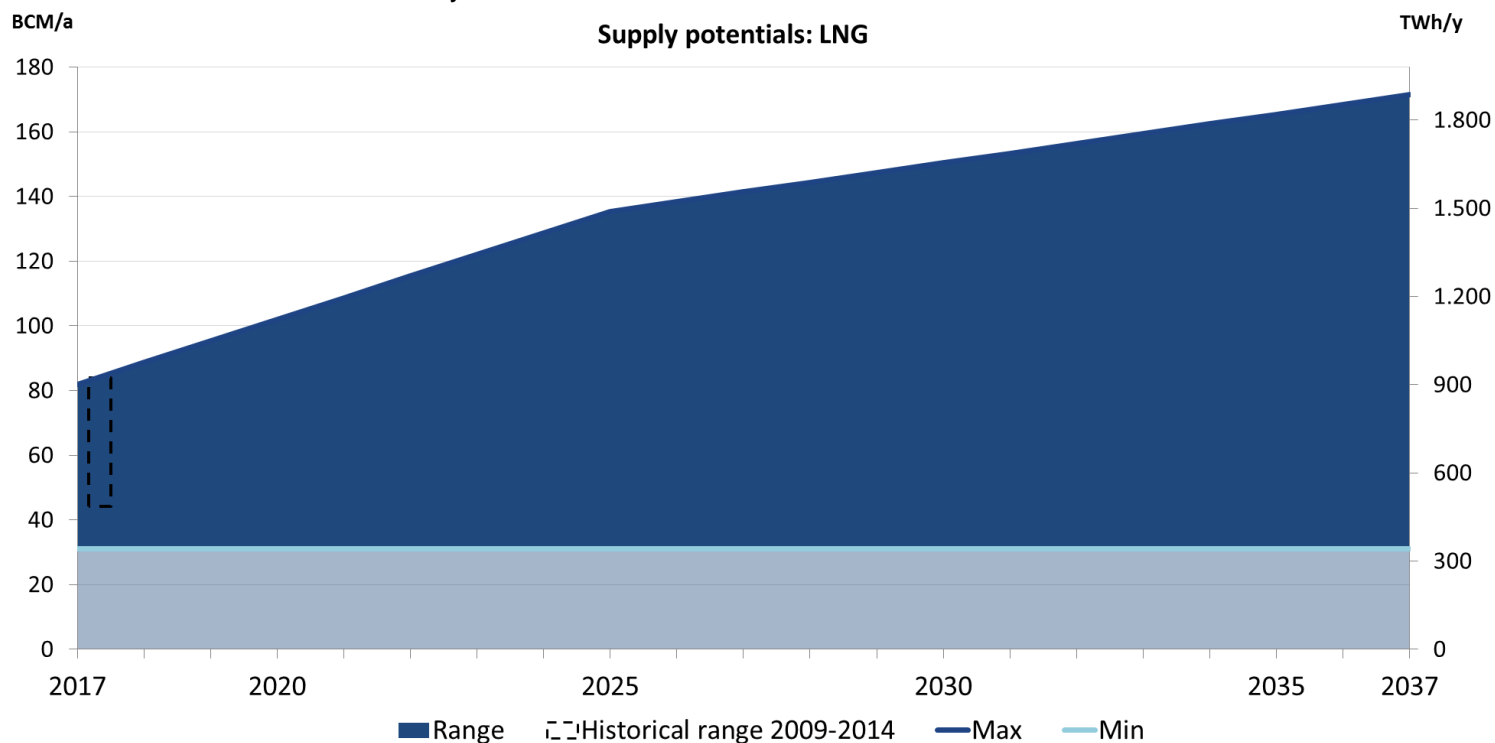


# LNG supply potentials TYNDP 2017



LNG Supply Potential						
bcma	2017*	2020	2025	2030	2035	2037
Maximum	71	102	135	150	165	171
Minimum	36	31	31	31	31	31

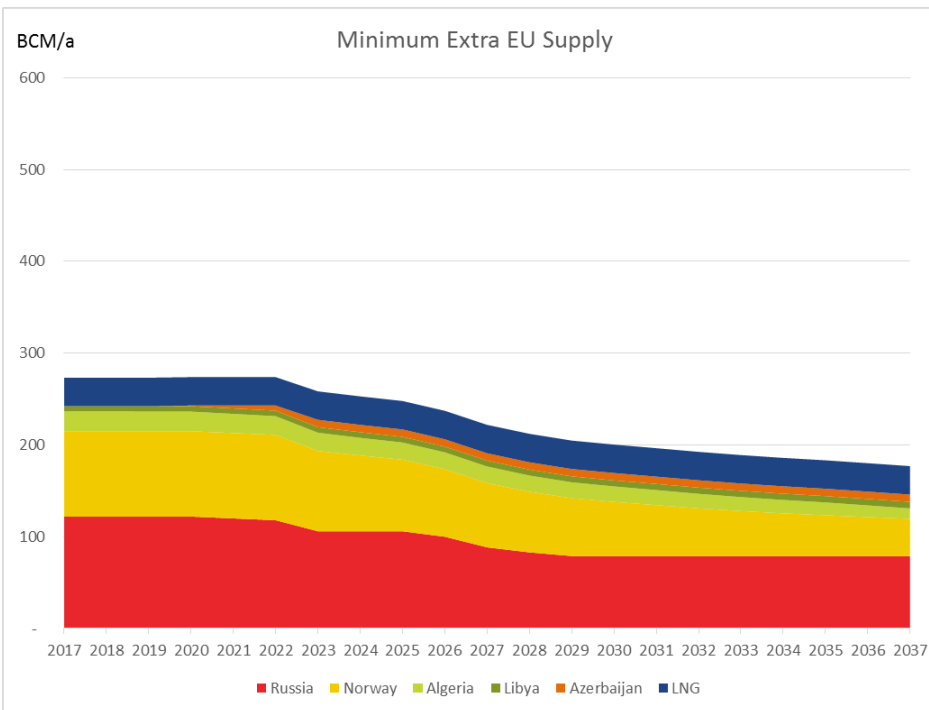
\* tomorrow as of today



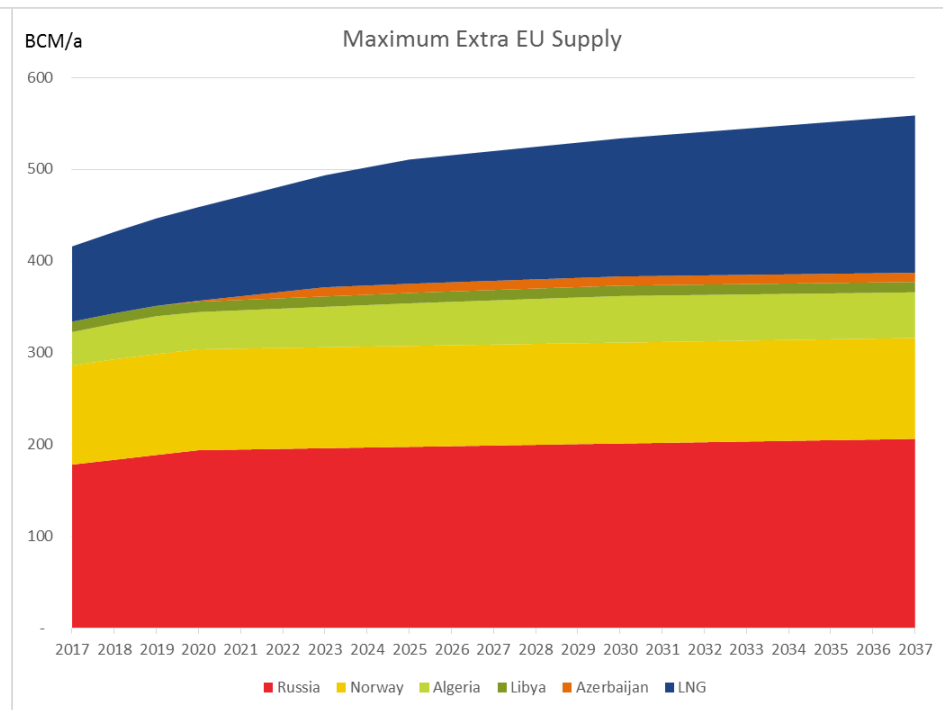
Source Max: 82 bcm (recent historical peak imports in 2011) plus 30% of additional world LNG exports compared to 2013 (source IEA WEO 2015)

Source Min: 70% of minimum EU imports between in 2019-2014

# Import Range



Minimum



Maximum

*The import range defines the flexibilities for the gas imports. Combining it with the demand and production figures and infrastructure projects will lead to the supply and demand adequacy.*



# Thank You for Your Attention

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