european network
of transmission system operators
for gas

SJWS 3

9 February 2016

TYNDP 2017

Supply potentials

System Development

Image Courtesy of Thyssengas

Introduction

1. **Conventional & Unconventional production (Shale Gas & Biogas)**
    - Use of TSO figures for system assessment

2. ***Import sources:***
    - *Algeria, Azerbaijan, Lybia, LNG, Norway and Russia*
    - *Align minimum supply assumptions for supply adequacy and assessment (modelling)*

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)

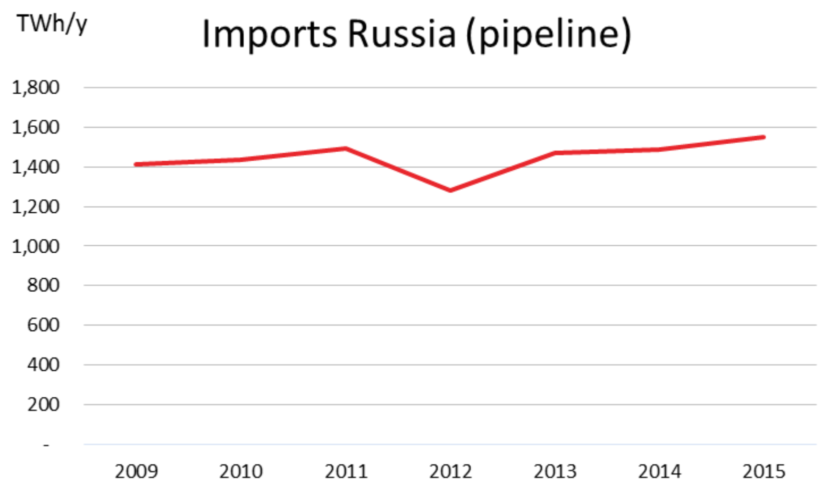
> **Unconventional production**
- Differentiation between uncertain potential scenarios and the assessment
- Help transparency by showing analysis
- Use of **TSO data** for TYNDP assessment

> **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)

Russia: Import routes and history

Three main pipelines:

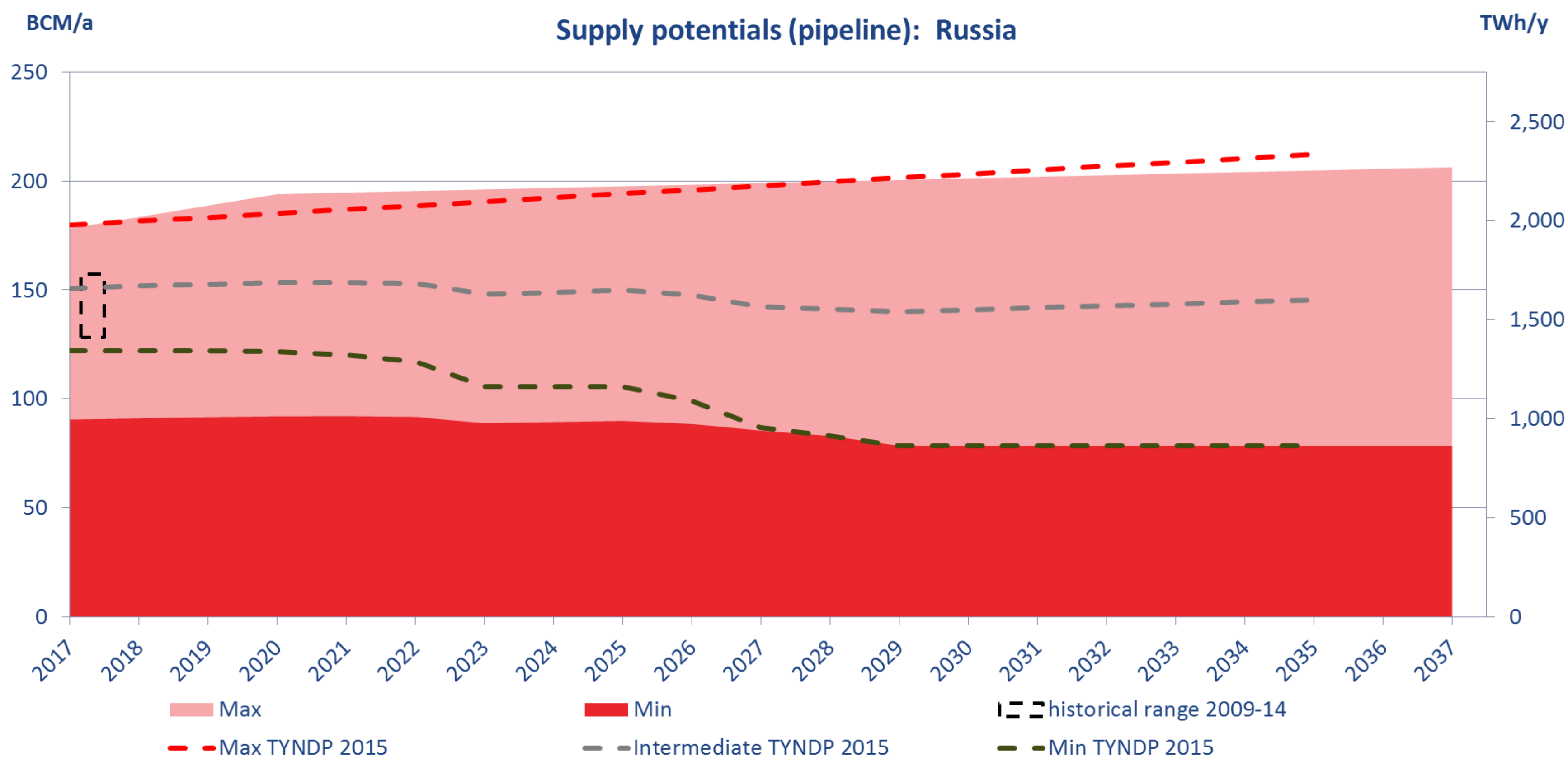
- **Nord Stream:** twin offshore pipeline, 1,220 km between Vyborg (Russia) and Greifswald (Germany), **55 bcma**
- **YAMAL-Europe:** 2,000 km to Poland and Germany via Belarus, **33 bcma**
- **Brotherhood** (Urengoy-Ushgorod pipeline): Transit through Ukraine to Central, Western, and Southern European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

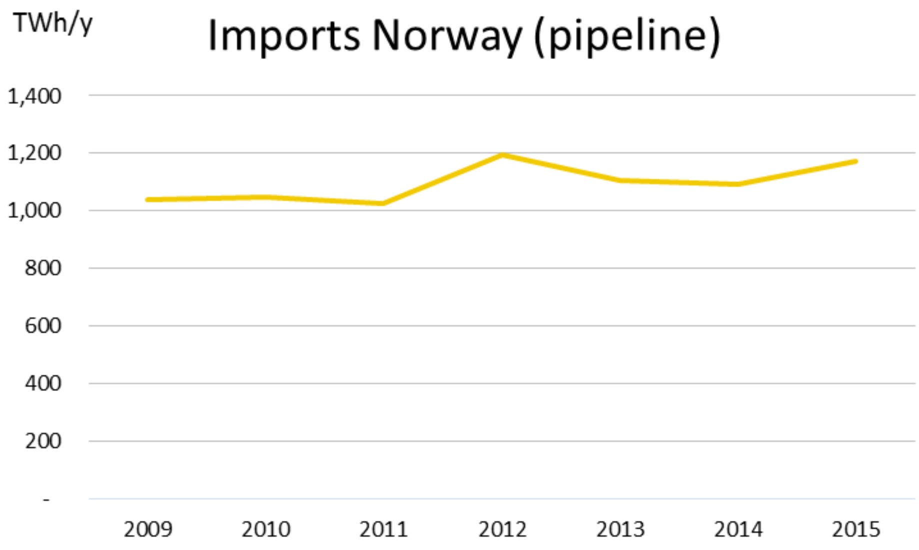
Russia: Supply potentials TYNDP 2017



Continuation of approach from TYNDP 2015.

Norway: Import routes and history

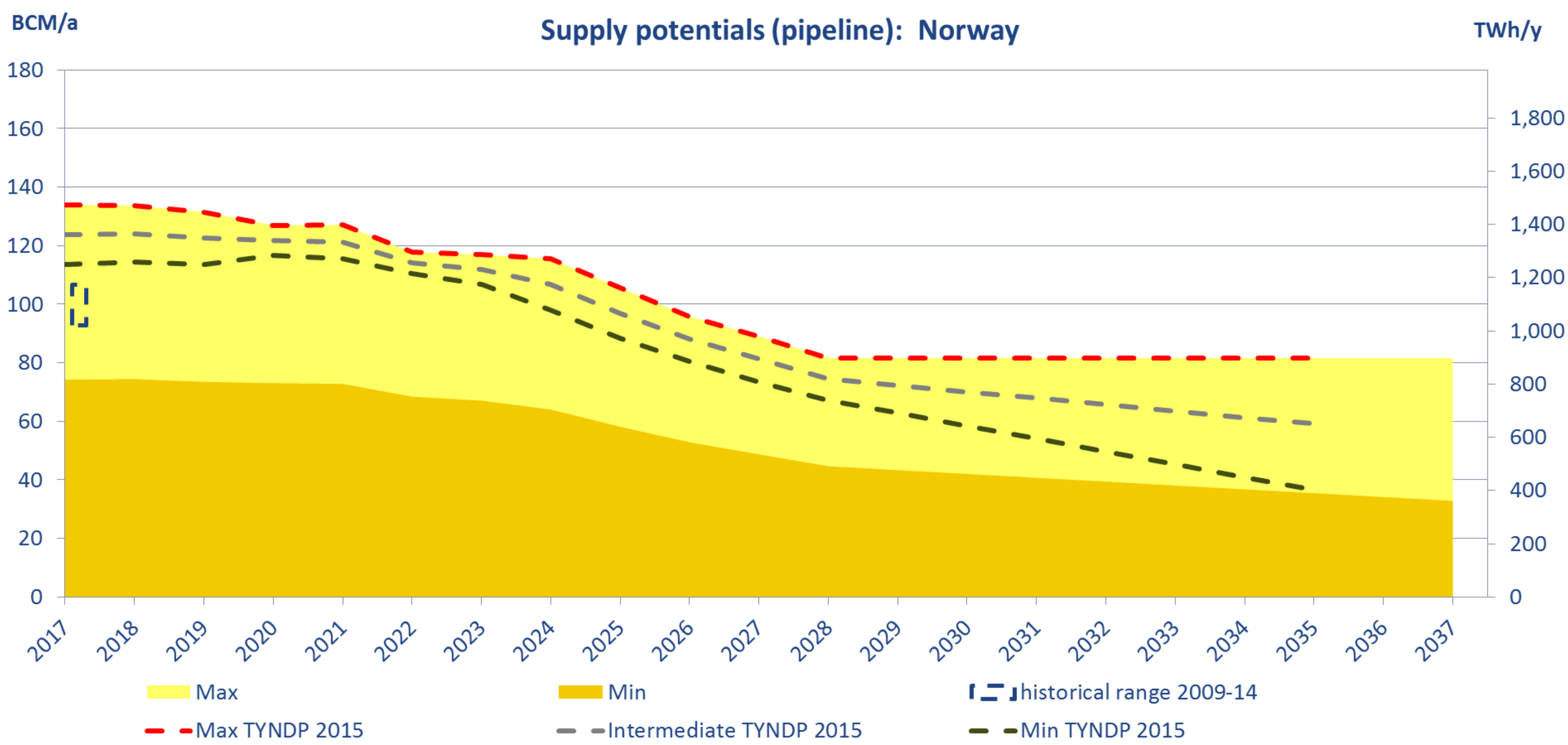
EXPORT CAPACITY OF THE GASSCO OFFSHORE SYSTEM		
Pipeline	**Country**	**Capacity (Million sm³ / d)**
Europipe	Germany	46
Europipe II	Germany	71
Franpipe	France	55
Norpipe	Germany, the Netherlands	32
Tampen Link	UK	10-27
Vesterled	UK	39
Zeepipe	Belgium	42
Langeled	UK	72-75
Gjøa Gas Pipeline	UK	17



According to Gassco website

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

Norway: Supply potentials

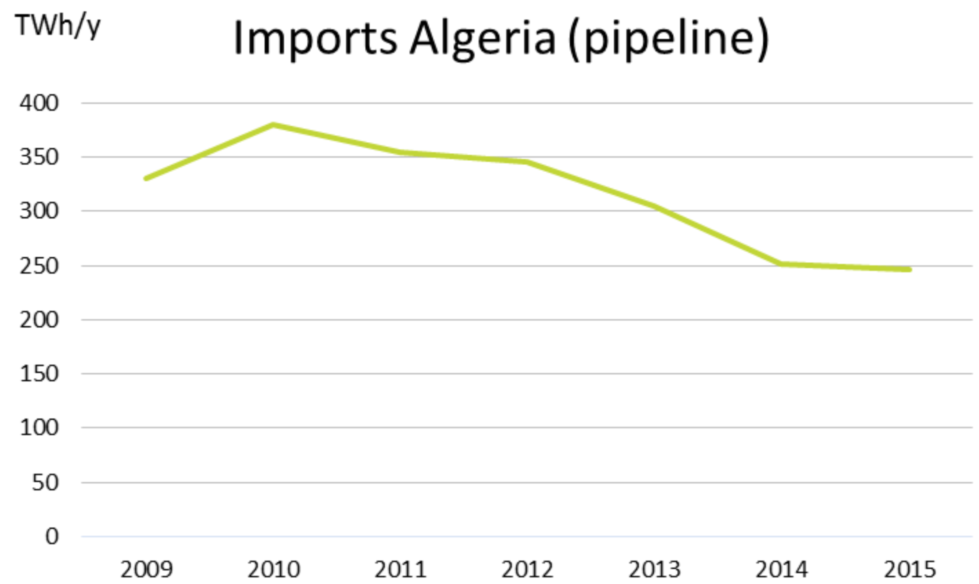


Continuation of approach from TYNDP 2015, newer information is welcome.

Algeria: Import routes and history

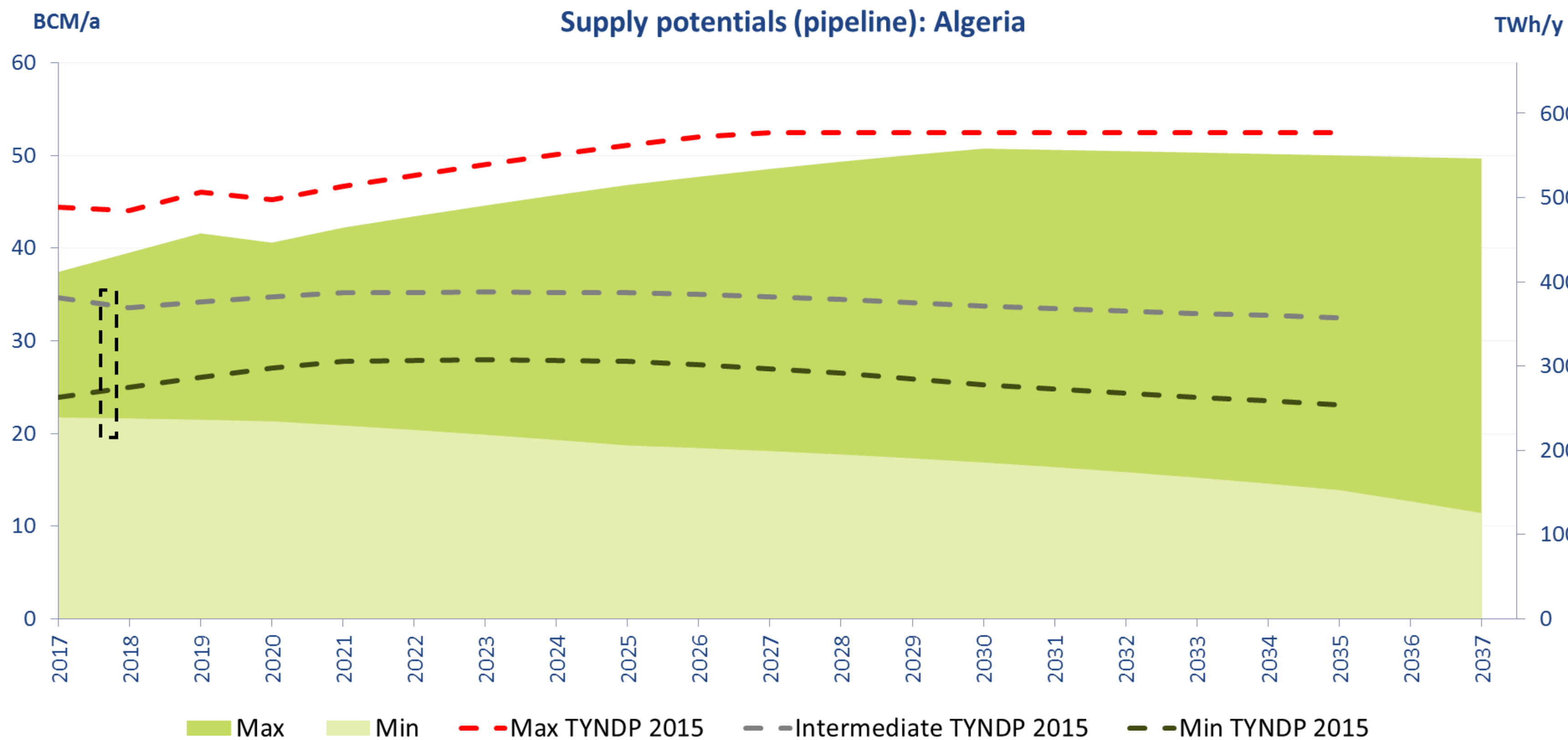
Pipelines:

- **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 ranking in the top ten countries with the largest gas reserves in the world.

Algeria: Supply potentials TYNDP 2017



Differentiated approach based on production and demand estimations.

Algeria supply potentials

TYNDP 2017 new assumptions

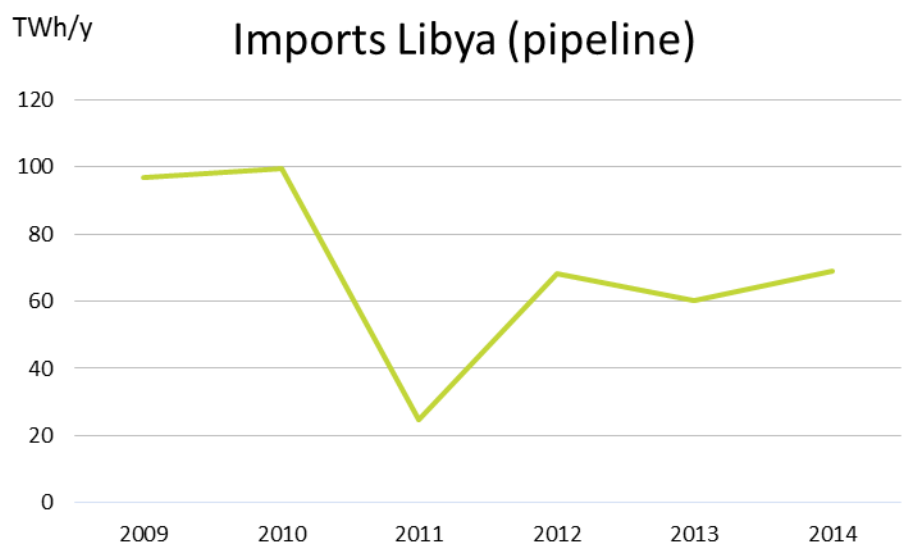
Methodology: *Production – Demand – African Exports – x % LNG Share*

	Production	Domestic Demand	African Exports	LNG Share
Max	**High** MEDPRO 2012 calibrated to 2014 current levels (BP SR)	**Low** MEDPRO 2012	**Low** BP SR 2010-2014 average x African demand development IEA - WEO 2015 (3,3%)	**Low** BP SR 2010-2014 Historical Average Share (35%)
Min	**Low** IEA - WEO 2015	**High** BP SR 2014 x African demand development IEA - WEO 2015 (3,3%)	**High** BP SR 2010-2014 max level x African demand development IEA - WEO 2015 (3,3%)	**High** BP SR 2010-2014 Historical Maximum Share (42%)

Libya: Import route and history

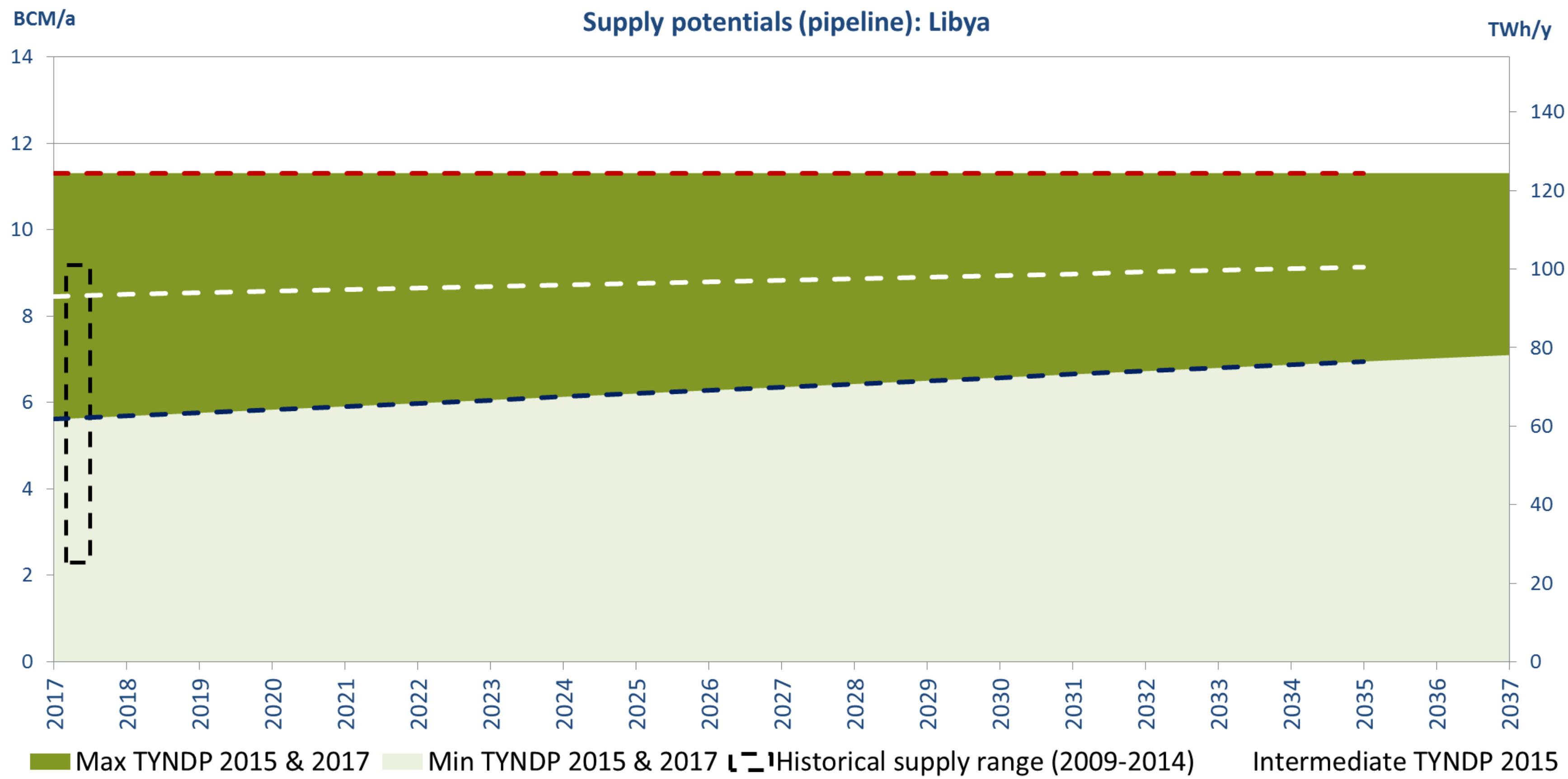
Pipeline:

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



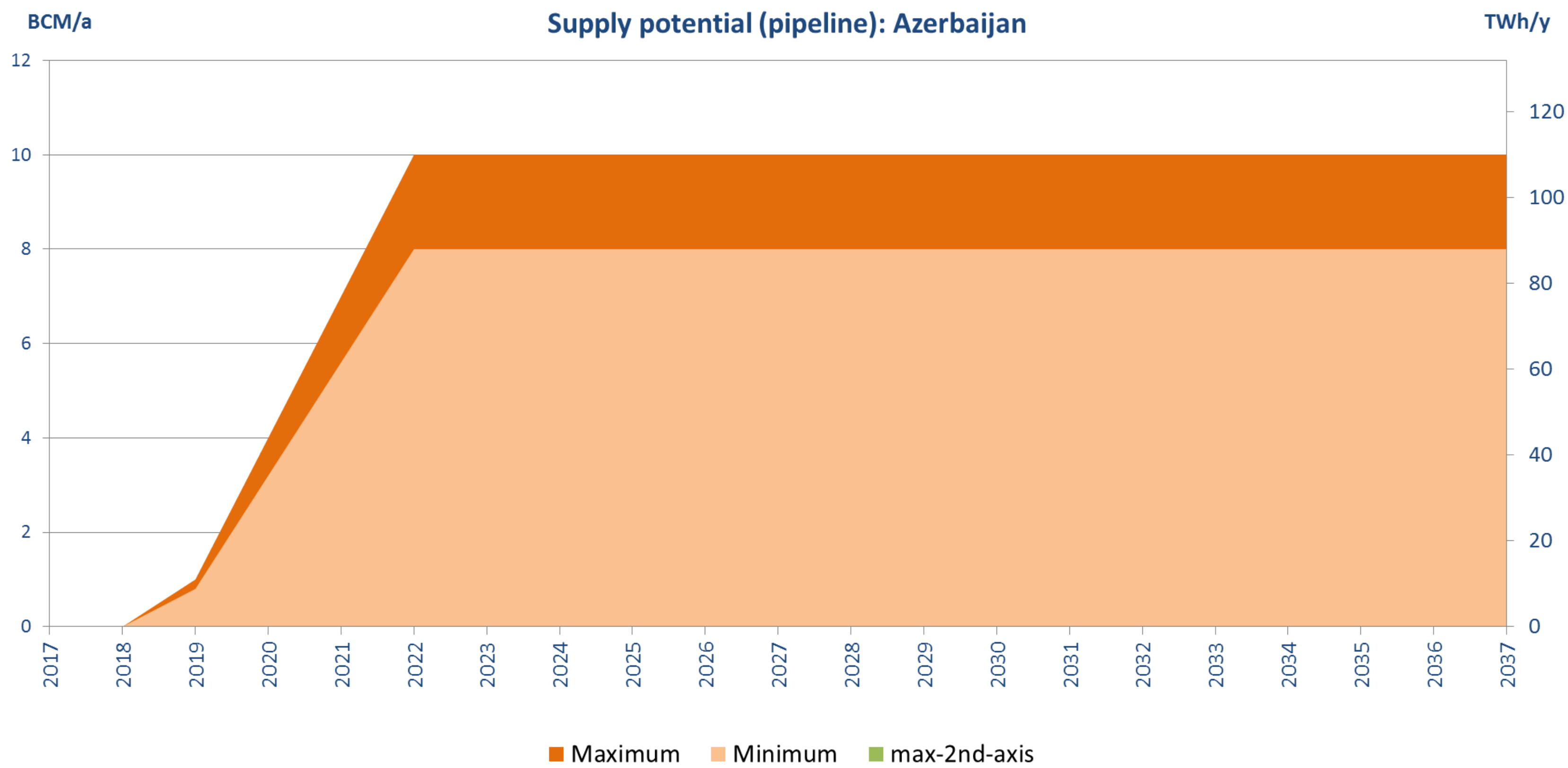
Currently the smallest pipeline supplier of the EU.

Libya: Supply potentials TYNDP 2017



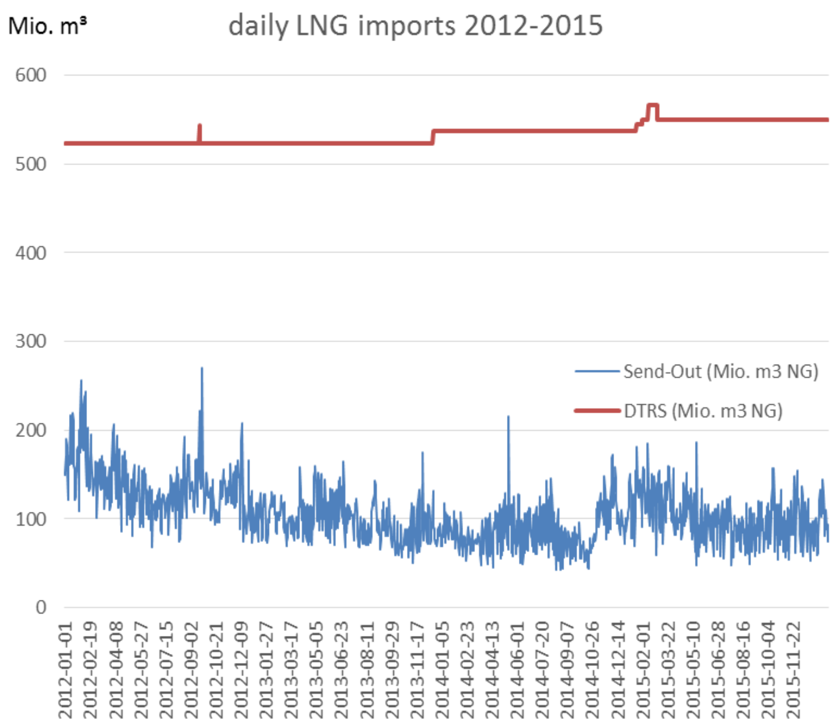
Continuity from approach from TYNDP 2015.

Azerbaijan supply scenarios

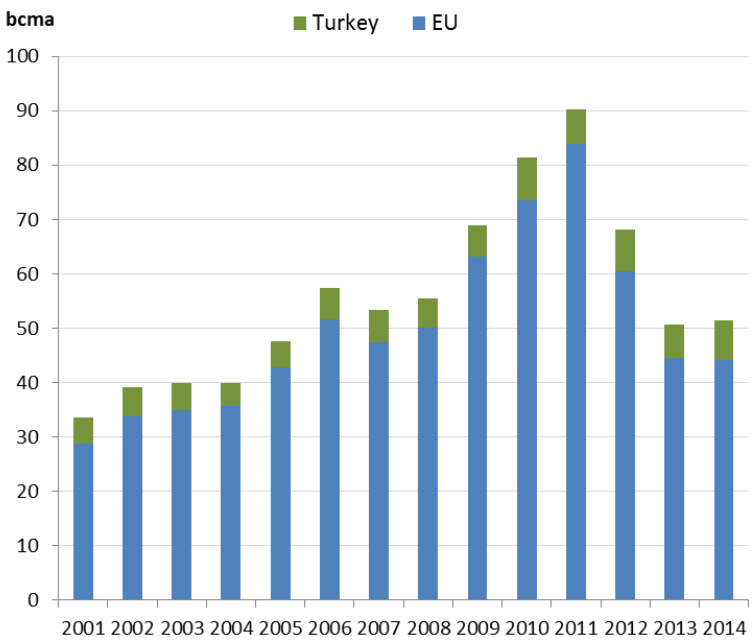


Azerbaijan is an upcoming pipeline supplier of the EU.

LNG import history



Numbers from ALSI platform



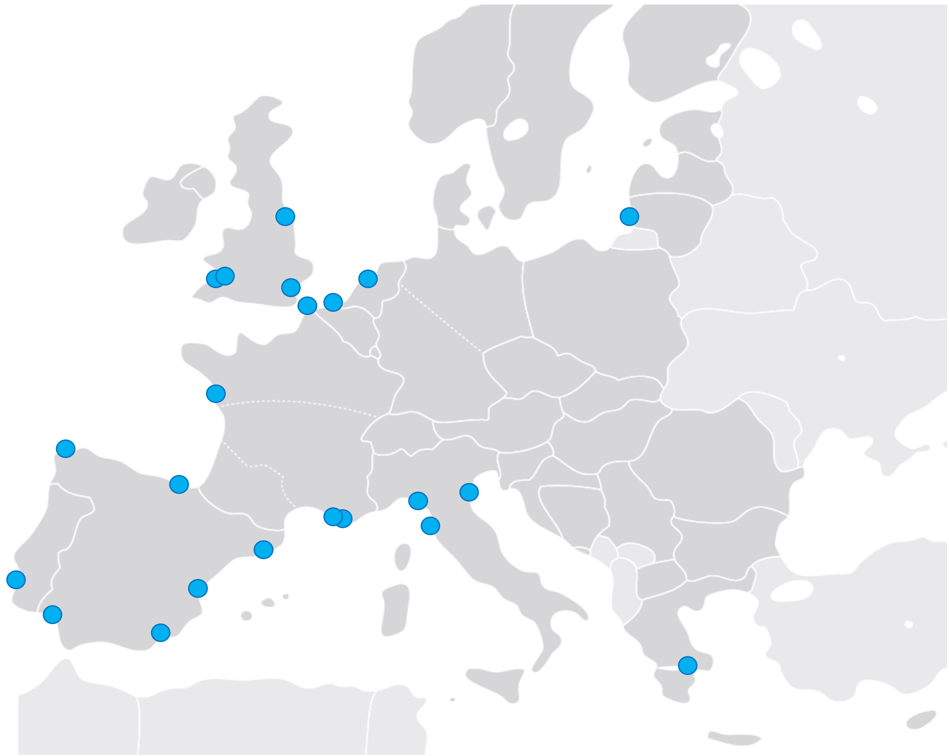
Numbers based on BP Statistical Review

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

LNG terminals

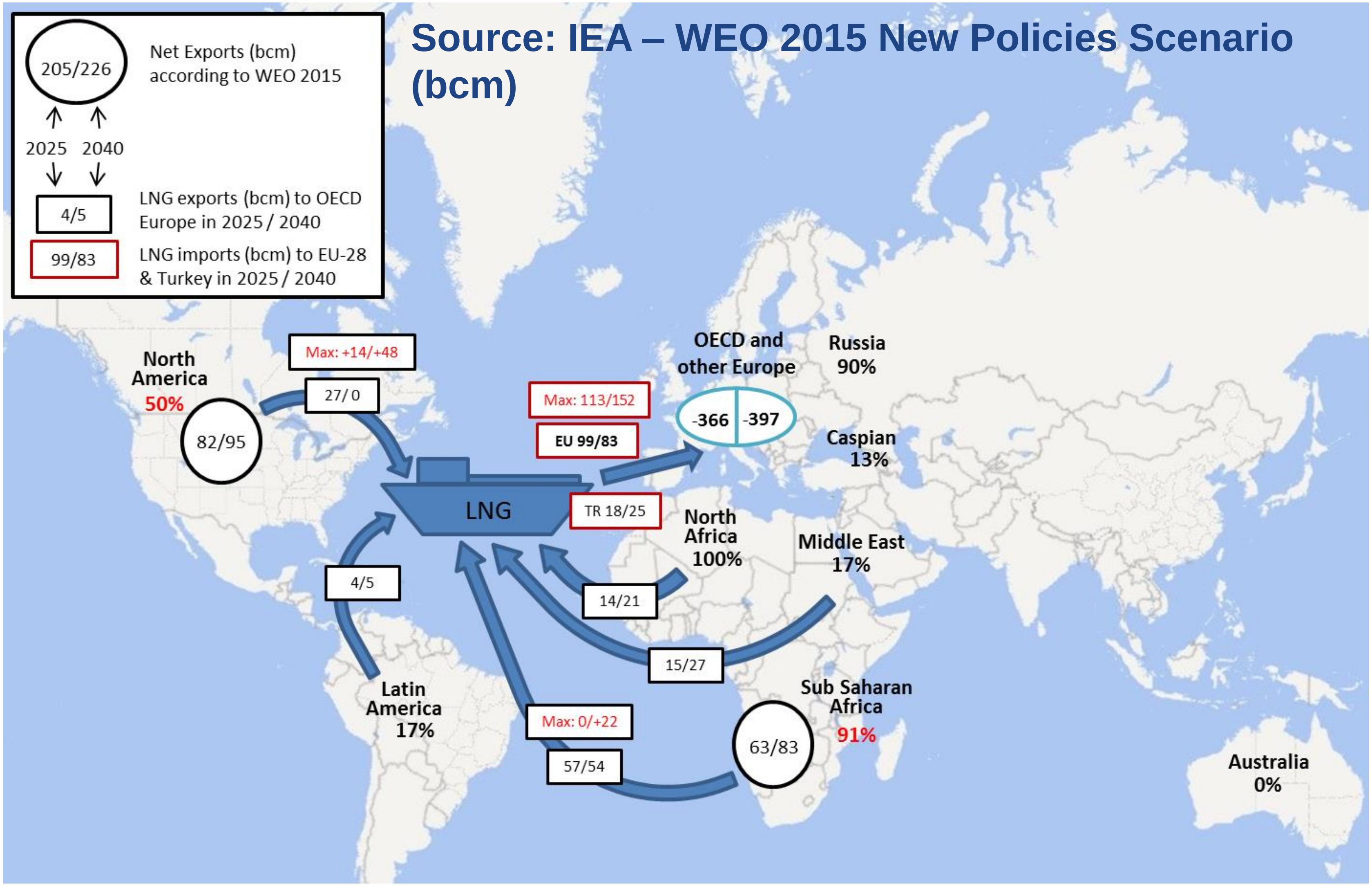
- 22 existing terminals (Barcelona, Bilbao, Cartagena, Cavarzere (Porto Levante / Adriatic LNG), Dunkerque, Fos (Tonkin/Cavaou), Gate Terminal, Huelva, Isle of Grain, Klaipeda (LNG), Milford Haven (South Hook), Milford Haven (Dragon LNG), Montoir de Bretagne, Mugardos, Musel, OLT LNG / Livorno, Panigaglia, Revythoussa, Sagunto, Sines, Teesside, Zeebrugge LNG)
- 7.8 Mio m³ LNG Declared Total Maximum Inventory*
- 550 Mio m³/d natural gas Declared Total Reference Sendout*

Operational LNG import points



*: From GLE’s ALSI platform

LNG max scenario



LNG supply potentials

Approach for TYNDP 2017:

- ***Max scenario** based on* IEA – WEO 2015 natural gas net trade by region in **New Policies Scenario** applying **LNG to EU share assumptions per every region**
- ***Min scenario** is the 70% minimum historical data from BP SR kept constant to the future*

Further improvements of methodology in stakeholder engagement process intended.