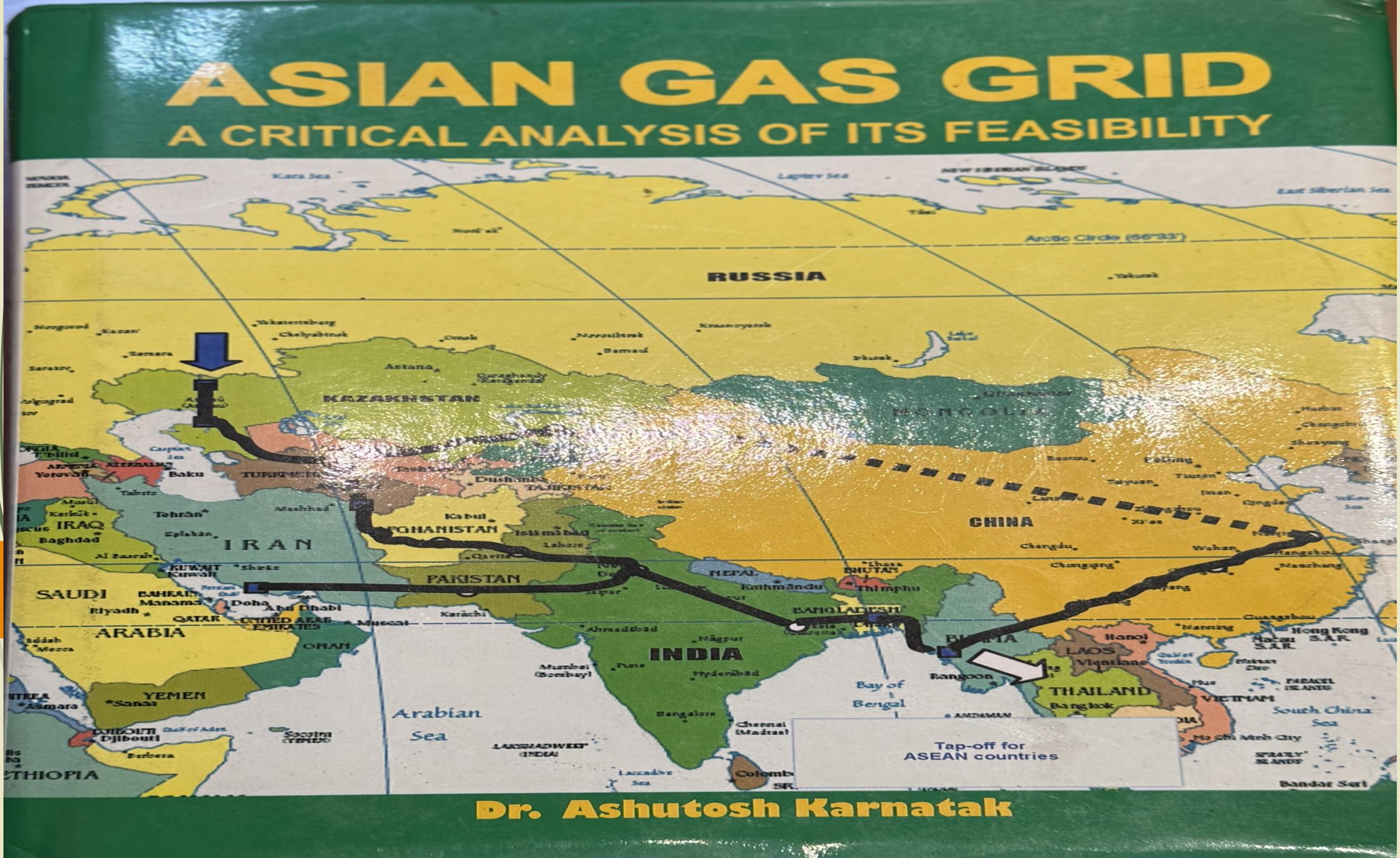
INFRASTRUCTURE AS A SECTOR ENABLE FOR INCREASED GAS PETETRATION

Transnational Pipelines

Essential For Energy Security Of India

Dr Ashutosh Karnatak

18TH SEPTEMBER, 2025


ASIAN GAS GRID
A CRITICAL ANALYSIS OF ITS FEASIBILITY
RUSSIA
Arctic Circle (66°33')
KAZAKHSTAN
MONGOLIA
CHINA
IRAN
IRAQ
AFGHANISTAN
PAKISTAN
INDIA
NEPAL
BHUTAN
BANGLADESH
THAILAND
VIETNAM
LAOS
SAUDI ARABIA
YEMEN
OMAN
ETHIOPIA
Arabian Sea
Bay of Bengal
South China Sea
Tap-off for
ASEAN countries
Dr. Ashutosh Karnatak

2

- Historical Context: The Dream of an Asian Gas Grid
- In 2009, my doctoral research envisioned an Asian Gas Grid, connecting resource-rich countries such as Turkmenistan, Afghanistan, Pakistan, India, Bangladesh, Myanmar, and China. The concept aimed to create a unified energy corridor across Asia. Here is the status of key segments today:

Segment	Approx Length	Status	Remarks
Turkmenistan-Afghanistan-Pakistan-India (TAPI)	~1,814 km	Stuck	Political and security challenges in Afghanistan and Pakistan.
India-Bangladesh	TBD	Not Done	Not initiated; holds potential for future collaboration.
Bangladesh-Myanmar	TBD	Not Done	Awaiting geopolitical alignment and bilateral agreements.
Myanmar-China	~2,500 km	Existing	Operational pipeline with robust capacity.
China-Turkmenistan	~7,000 km	Completed	China has built three pipelines importing ~50 BCM/year from Turkmenistan.

DETERMINANTS OF ENERGY

- **Availability : Domestic , LNG or Transnational Pipeline**
- **Accessibility : National Gas Grid and CGD network**
- **Affordability : Price Elastic – availability as per affordability**
- **Acceptability : Environment Friendly**

Countries Sourcing Gas From Transnational Pipelines

COUNTRIES SOURCING GAS FROM TRANSNATIONAL PIPELINES

Geography	Total gas required (consumption)	Domestic production	Imported via LNG	Imported via pipelines
Europe (EU-27)	326	38 (12%)	122 (38%)	168 (52%)
Türkiye	50	0.81 (1.7%)	14 (28%)	37 (74%)
China	395	230 (58%)	98 (25%)	68 (17.2%)

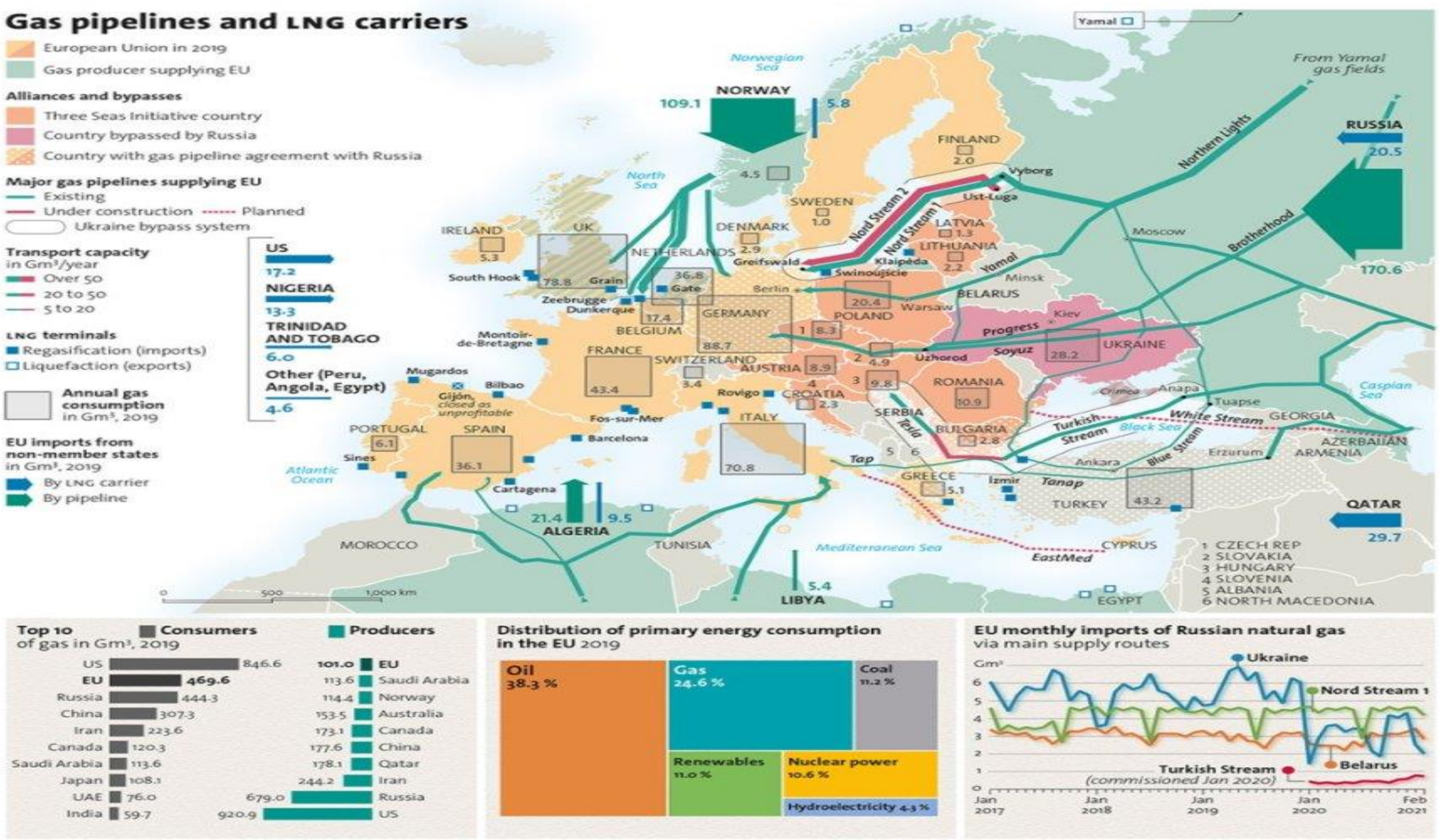
Source : IEA

EUROPE GAS PIPELINE NETWORK

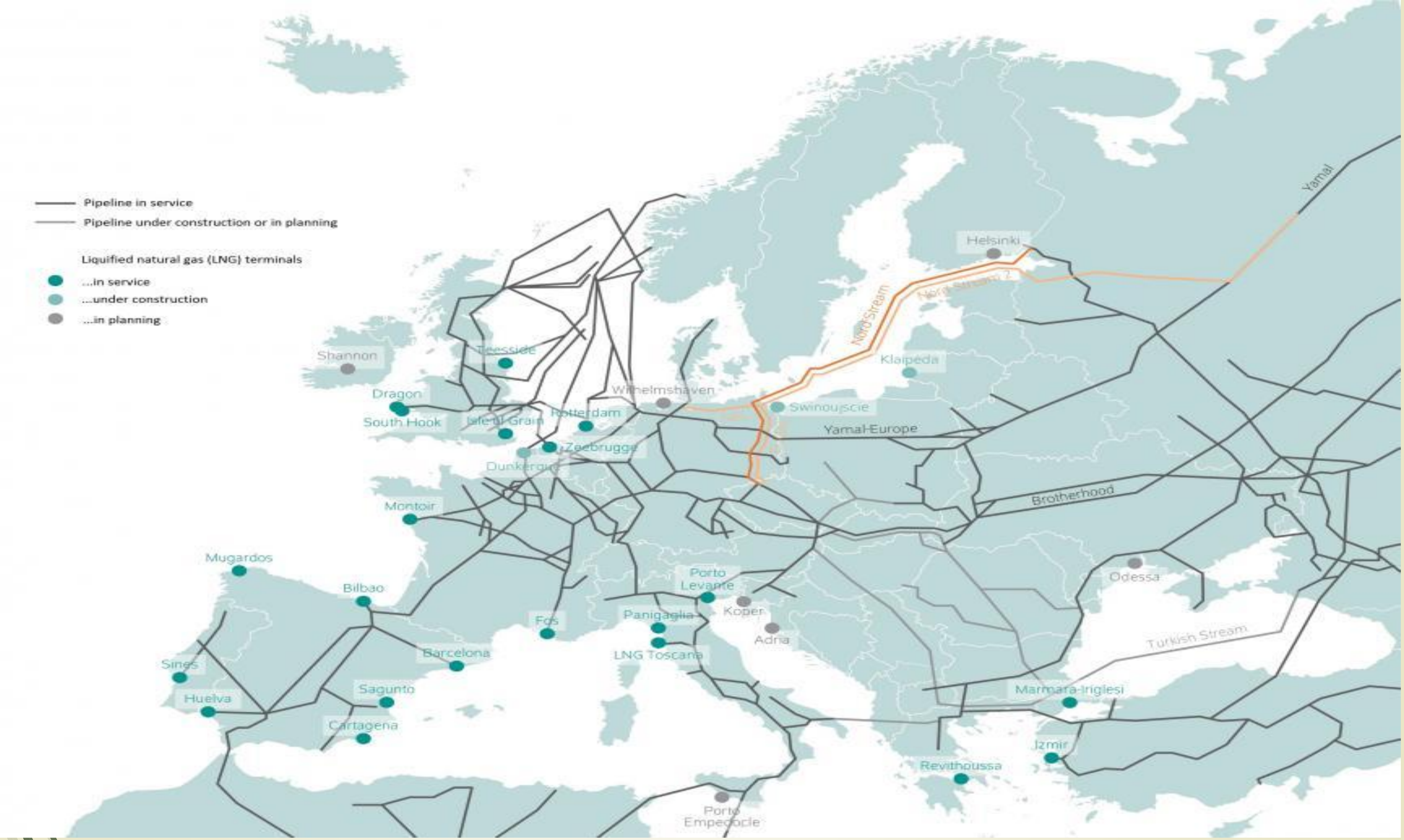
Dense network of pipelines criss-crossing Western, Central, and Eastern Europe.

Major pipeline arteries:

Russia to Europe (through Ukraine, Nord Stream, etc.), routes via the Balkans, pipelines from the Caspian / Southern Gas Corridor.



Gas pipelines and LNG carriers
European Union in 2019
Gas producer supplying EU
Alliances and bypasses
Three Seas Initiative country
Country bypassed by Russia
Country with gas pipeline agreement with Russia
Major gas pipelines supplying EU
Existing
Under construction
Planned
Ukraine bypass system
Transport capacity in Gm³/year
Over 50
20 to 50
5 to 20
LNG terminals
Regasification (imports)
Liquefaction (exports)
Annual gas consumption in Gm³, 2019
EU imports from non-member states in Gm³, 2019
By LNG carrier
By pipeline
US 17.2
NIGERIA 13.3
TRINIDAD AND TOBAGO 6.0
Other (Peru, Angola, Egypt) 4.6
NORWAY 109.1
5.8
RUSSIA 20.5
170.6
QATAR 29.7
ALGERIA 21.4 9.5
LIBYA 5.4
From Yamal gas fields
Yamal
Northern Lights
Brotherhood
Progress
Soyuz
Nord Stream 1
Nord Stream 2
Yamal
Turkish Stream
White Stream
Blue Stream
Tesla
Tap
Tanap
EastMed
Norwegian Sea
North Sea
Atlantic Ocean
Mediterranean Sea
Black Sea
Caspian Sea
FINLAND 2.0
SWEDEN 1.0
4.5
DENMARK 2.9
IRELAND 5.3
UK 78.8
NETHERLANDS 36.8
BELGIUM 17.4
GERMANY 88.7
FRANCE 43.4
SWITZERLAND 3.4
AUSTRIA 8.9
POLAND 20.4
LATVIA 1.3
LITHUANIA 2.2
BELARUS
UKRAINE 28.2
ROMANIA 10.9
BULGARIA 2.8
SERBIA
CROATIA 2.3
ITALY 70.8
SPAIN 36.1
PORTUGAL 6.1
GREECE 5.1
TURKEY 43.2
GEORGIA
AZERBAIJAN
ARMENIA
CYPRUS
EGYPT
MOROCCO
TUNISIA
1 8.3
2 4.9
3 9.8
4
5
6
Vyborg
Ust-Luga
Moscow
Minsk
Kiev
Warsaw
Uzhorod
Berlin
Greifswald
Swinoujscie
Klaipeda
South Hook
Grain
Zeebrugge
Dunkerque
Gate
Montoir-de-Bretagne
Mugardos
Bilbao
Gijón, closed as unprofitable
Fos-sur-Mer
Barcelona
Rovigo
Sines
Cartagena
Crimea
Anapa
Tuapse
Erzurum
Ankara
Izmir
1 CZECH REP
2 SLOVAKIA
3 HUNGARY
4 SLOVENIA
5 ALBANIA
6 NORTH MACEDONIA
0 500 1,000 km
Top 10 of gas in Gm³, 2019
Consumers
US 846.6
EU 469.6
Russia 444.3
China 307.3
Iran 223.6
Canada 120.3
Saudi Arabia 113.6
Japan 108.1
UAE 76.0
India 59.7
Producers
101.0 EU
113.6 Saudi Arabia
114.4 Norway
153.5 Australia
173.1 Canada
177.6 China
178.1 Qatar
244.2 Iran
679.0 Russia
920.9 US
Distribution of primary energy consumption in the EU 2019
Oil 38.3 %
Gas 24.6 %
Coal 11.2 %
Renewables 11.0 %
Nuclear power 10.6 %
Hydroelectricity 4.3 %
EU monthly imports of Russian natural gas via main supply routes
Gm³
6
5
4
3
2
1
0
Ukraine
Nord Stream 1
Turkish Stream (commissioned Jan 2020)
Belarus
Jan 2017
Jan 2018
Jan 2019
Jan 2020
Feb 2021



Pipeline in service
Pipeline under construction or in planning
Liquified natural gas (LNG) terminals
...in service
...under construction
...in planning
Yamal
Helsinki
Nord Stream
Nord Stream 2
Klaipeda
Shannon
Teesside
Dragon
South Hook
Isle of Grain
Rotterdam
Wilhelmshaven
Swinoujscie
Yamal-Europe
Zeebrugge
Dunkerque
Brotherhood
Montoir
Mugardos
Bilbao
Porto Levante
Koper
Odessa
Adria
Fos
Panigaglia
LNG Toscana
Barcelona
Turkish Stream
Sines
Huelva
Sagunto
Cartagena
Marmara-Ingiesi
Izmir
Revithoussa
Porto Empedocle

TURKEY PIPELINE NETWORK

Turkey acts as a transit point between gas-rich regions (Caspian, Russia, Middle East) and Europe.

Pipelines like Turk-Stream, other southern gas corridors .

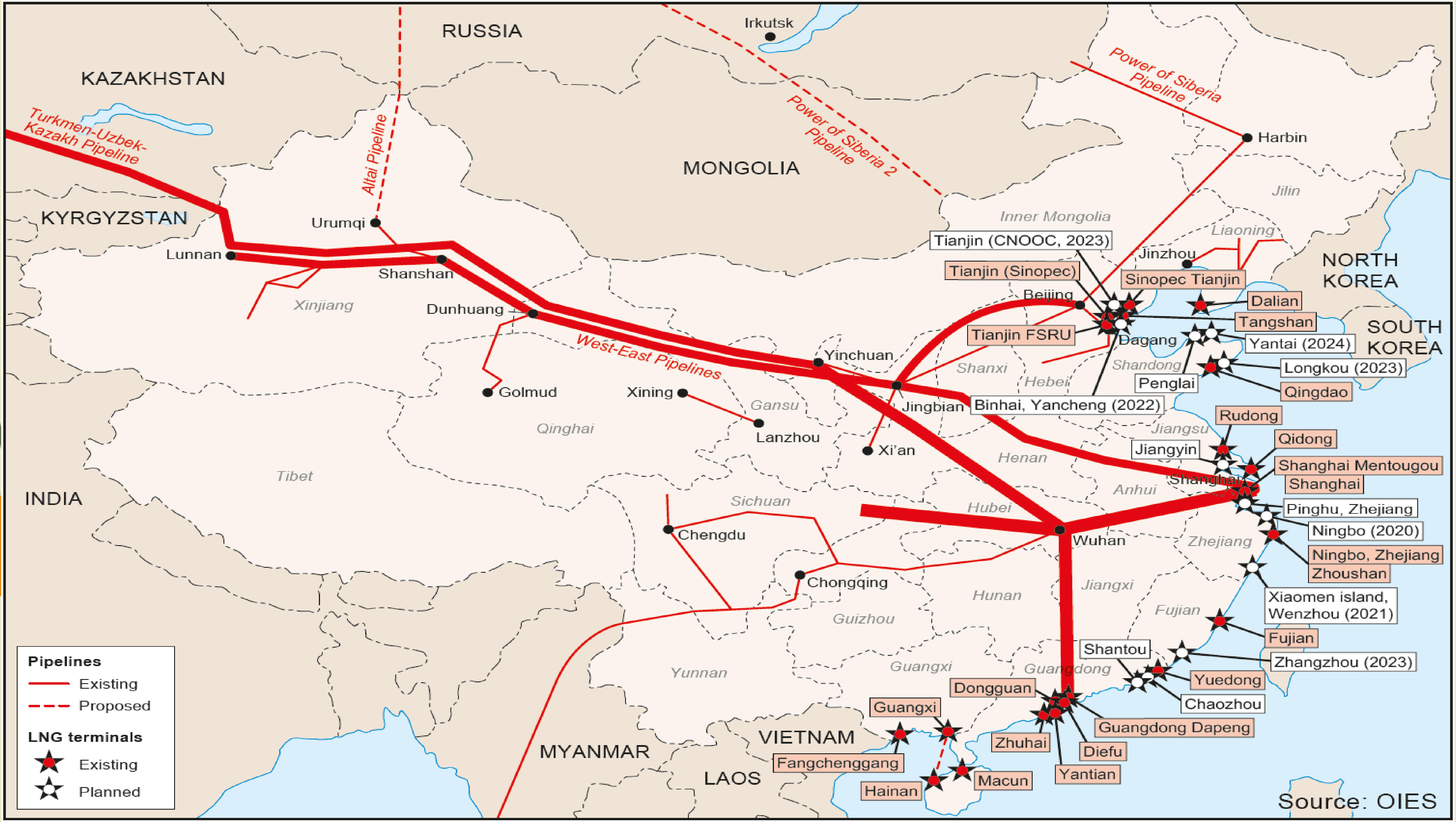
DOĞAL GAZ GİRİŞ KAPASİTELERİ

	Gerçekleşen	Hedeflenen
Rusya - TürkAkım	47,3 milyon m³/gün	
BOTAŞ Marmara LNG Terminali	37 milyon m³/gün	
Egegaz LNG Terminali	40 milyon m³/gün	
Etki Liman FSRU	28 milyon m³/gün	
TANAP	17,3 milyon m³/gün	
Tuz Gölü Yer Altı Doğal Gaz Depolama Tesisi	20 milyon m³/gün	80 milyon m³/gün
BOTAŞ Dörtyol FSRU	28 milyon m³/gün	
Azerbaycan	19,1 milyon m³/gün	
İran	28,5 milyon m³/gün	
BOTAŞ Saros FSRU		28 milyon m³/gün
Silivri Yer Altı Doğal Gaz Depolama Tesisi	25 milyon m³/gün	75 milyon m³/gün

CHINA GAS PIPELINE NETWORK

Pipelines from Central Asia (Turkmenistan, Kazakhstan, Uzbekistan).
China-Myanmar pipeline.

Russia to China (e.g. Power of Siberia and now Siberia -2) pipelines.

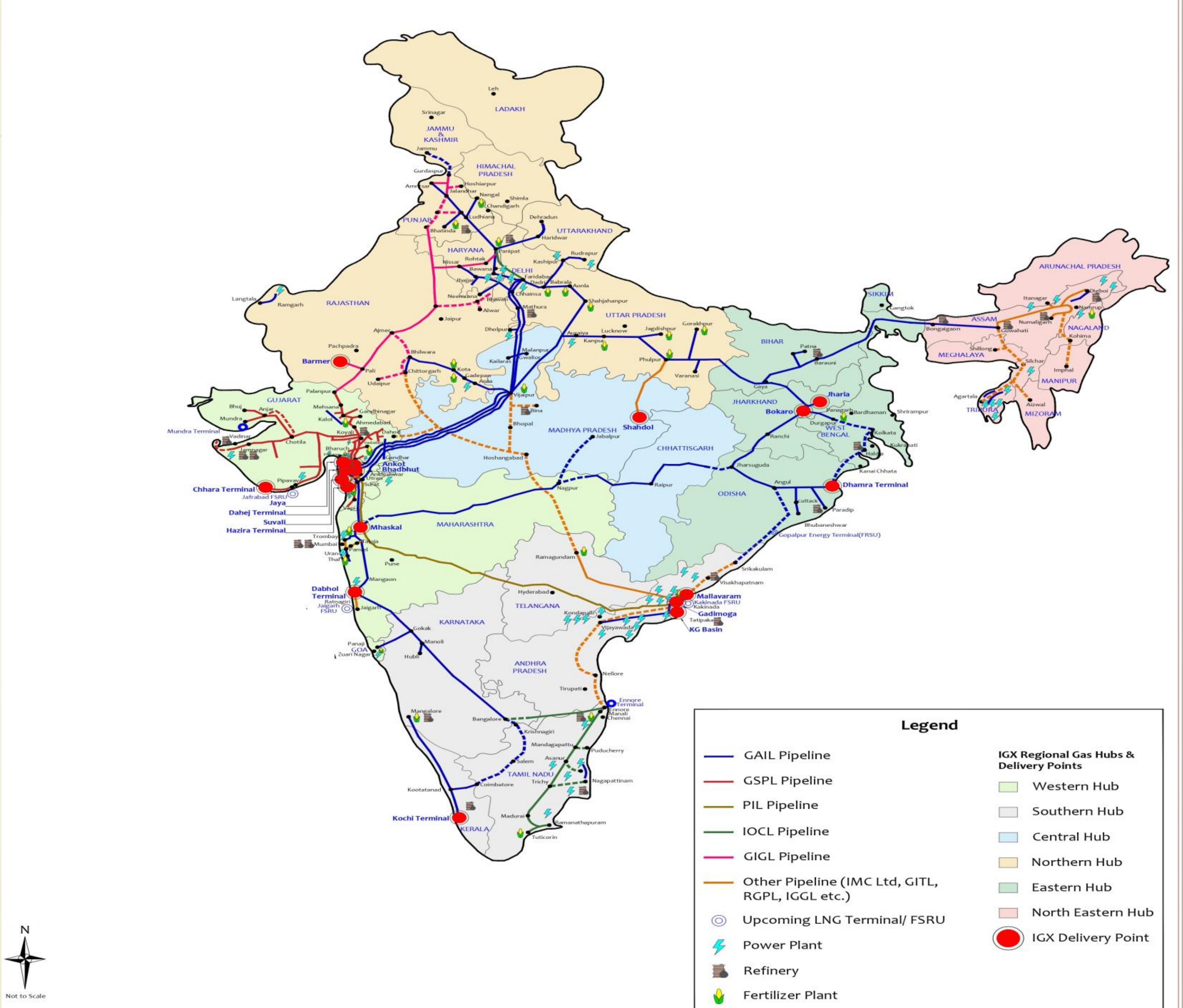


RUSSIA
KAZAKHSTAN
Irkutsk
Turkmen-Uzbek-Kazakh Pipeline
Altai Pipeline
Power of Siberia 2 Pipeline
Power of Siberia Pipeline
MONGOLIA
Harbin
KYRGYZSTAN
Urumqi
Lunnan
Shanshan
Xinjiang
Dunhuang
West-East Pipelines
Inner Mongolia
Jilin
Liaoning
Jinzhou
NORTH KOREA
SOUTH KOREA
Tianjin (CNOOC, 2023)
Tianjin (Sinopec)
Sinopec Tianjin
Beijing
Dalian
Tangshan
Tianjin FSRU
Dagang
Yantai (2024)
Longkou (2023)
Qingdao
Penglai
Shandong
Yinchuan
Shanxi
Hebei
Jingbian
Binhai, Yancheng (2022)
Golmud
Xining
Gansu
Lanzhou
Qinghai
Xi'an
Rudong
Qidong
Jiangsu
Jiangyin
Shanghai Mentougou
Shanghai
Henan
Anhui
Tibet
INDIA
Sichuan
Hubei
Pinghu, Zhejiang
Ningbo (2020)
Ningbo, Zhejiang
Zhoushan
Chengdu
Wuhan
Zhejiang
Chongqing
Hunan
Jiangxi
Xiaomen island, Wenzhou (2021)
Fujian
Guizhou
Fujian
Shantou
Zhangzhou (2023)
Yunnan
Guangxi
Guangdong
Yuedong
Chaozhou
Dongguan
Guangxi
Guangdong Dapeng
VIETNAM
Zhuhai
Diefu
MYANMAR
Fangchenggang
Yantian
LAOS
Hainan
Macun
Pipelines
Existing
Proposed
LNG terminals
Existing
Planned
Source: OIES

INDIA

NATURAL GAS INFRASTRUCTURE

As on December-2024



Disclaimer: This map of natural gas infrastructure in India has been prepared as an illustrative and indicative material using information/data readily available in the public domain. Entities are advised to use the map at their own discretion. Indian Gas Exchange (IGX) take no responsibility for the correctness or completeness hereof or any liability or loss derived due to reliance upon the map.

REVISED STRATEGY FOR INDIA: EXPLORING ALTERNATIVE SOURCES

India's energy security strategy hinges on developing a **hybrid energy model** combining domestic resources, LNG imports, and transnational pipelines

Let us now delve deeper into the **potential of transnational pipelines**, which hold the key to India's future energy stability and growth.

Given geopolitical challenges, India must explore alternative routes:

1. **TAPI Pipeline**: Efforts to resolve regional security issues and operationalize this pipeline should continue.
2. **Subsea Pipelines from UAE or Oman**: Advanced subsea pipeline technologies offer a feasible and secure alternative for gas imports, potentially providing **75–100 MMSCMD** at affordable price

MODES OF GAS SOURCING

To meet India's growing demand for natural gas, a balanced **Hybrid Approach** is required, incorporating three key modes:

Domestic Production:

- **Strategy**: Intensify exploration and development of untapped gas fields.
- **Challenges**: Limited reserves and slow production growth.

LNG Imports:

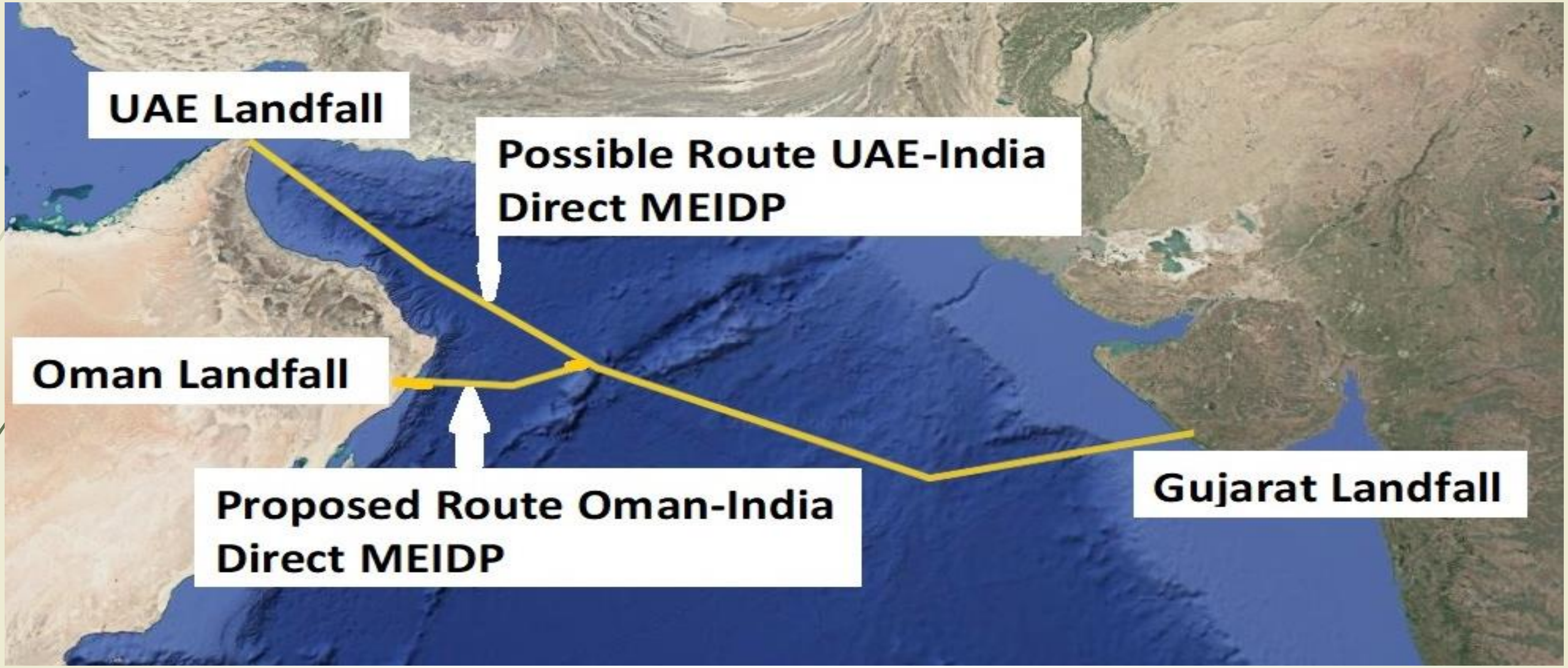
- **Availability**: Ample global supply.
- **Challenges**: High transportation and regasification costs.

Transnational Pipelines:

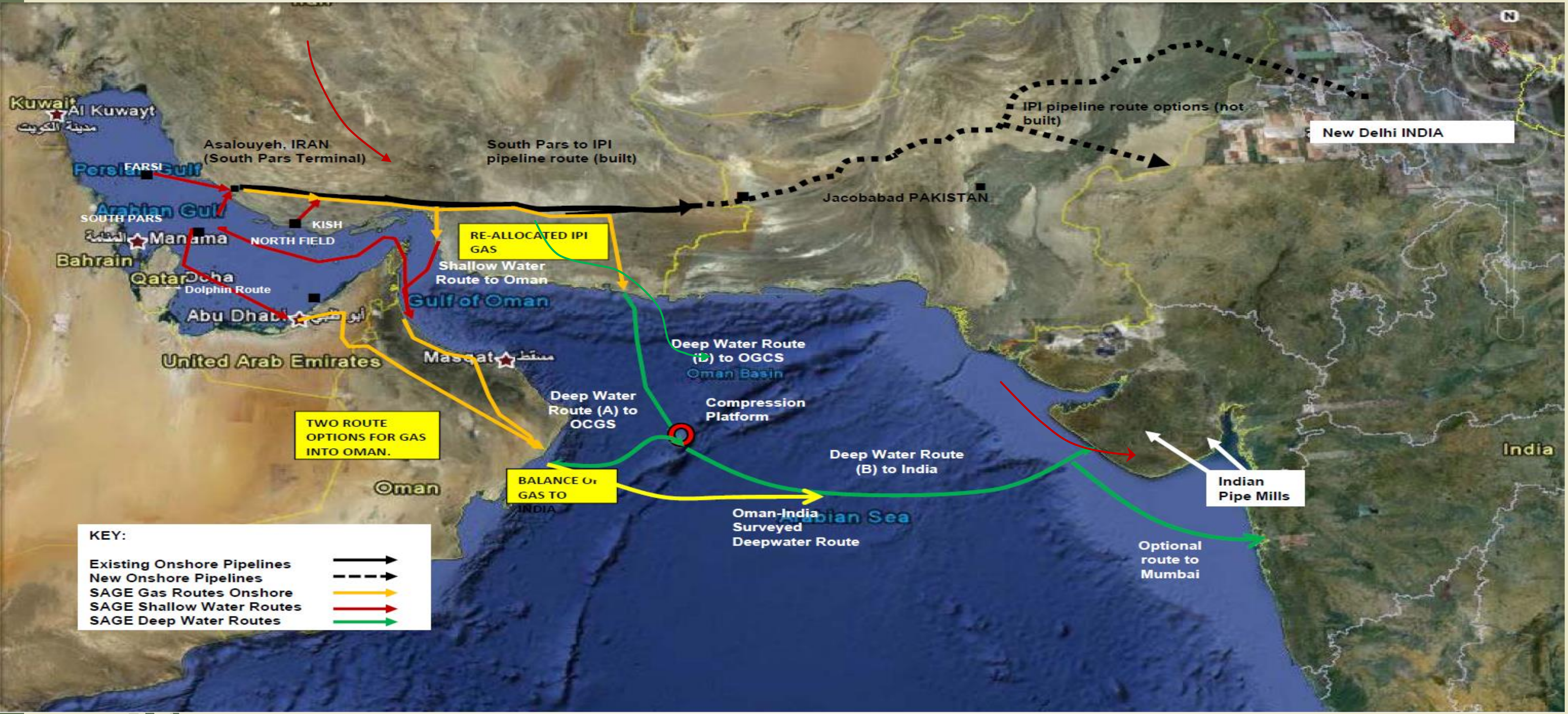
- **Priority Projects**:
  - TAPI (pending geopolitical resolution).
  - **Subsea pipeline from UAE or Oman (enabled by advanced pipeline technology).**

OMAN-INDIA SUB-SEA PIPELINE

Courtesy : Mr. Subodh Kumar Jain M/S Siddho Mal Group for sharing the study got done by them


UAE Landfall
Possible Route UAE-India
Direct MEIDP
Oman Landfall
Proposed Route Oman-India
Direct MEIDP
Gujarat Landfall

MEIDP | GAS ROUTES TO INDIA



MEIDP | Project Vision

Project	Middle East to India Deep-Water Gas Pipeline (MEIDP)
Project Developer	South Asia Gas Enterprise Pvt Ltd (SAGE), part of the Siddhomal Group The Group has over 50 years of experience in the Indian industry and a special focus in Project Development in Oman
Proposal	Development of an Energy Corridor for transportation of Natural Gas from Middle East to India by the safest, most economical and reliable means (avoiding Strait of Hormuz)
Proposed Route	Middle East Landfall (UAE-Fujairah/Oman) to India Landfall (Gujarat), via the Arabian Sea
Common Carrier	The pipeline will be laid as a "Common Carrier" pipeline whereby SAGE will be the Gas Transporter and will be paid a Tariff for pipeline use
Tri-Partite Agreement	Gas Buyers & Gas Sellers will negotiate the Long-Term Gas Supply Contract along with MEIDP-SPV in a Tri-Partite Framework Agreement
Global Consortium	SAGE has been working on the Project with Global Consortium - has already invested over $20 Million on the MEIDP Project

MEIDP | PROJECT DETAILS

Start Point	UAE (Fujairah) or Oman (Both are Outside of the Strait of Hormuz)
End Point	Near Porbandar (South Gujarat), India
Throughput	31.1 MMSCMD (~8.6 MMTPA)
Inlet Pressure	400 barg
Diameter	28” ID- till ~2200m water depth, 24” ID from ~2200m to 3420m
Wall Thickness	32.9 – 40.5mm WT (DNVGL ST-F101)
Steel Grade	DNV 485 Grade Carbon Steel (API X70 Equivalent)
Max. Depth	3420 m
Length	1200 - 1598 km
Steel Tonnage	800,000 tonnes (approx.)
Implementation Period	5 years (on Fast Track)
Pipeline Laying Time	2 years
Estimated Cost	$ 7.36 Billion from UAE (start point) $ 5.50 Billion from Oman (start point)

Powering Viksit Bharat 2047

- Our Vision for **'Viksit Bharat by 2047'** requires adequate energy to sustain India's growth trajectory.

- The Indian Government aims to increase the share of natural gas to **15% of the Energy Mix by 2030**, with majority of the demand being driven by 3 key sectors – **Power, Fertilizer and City Gas Distribution.**

- **Potential natural gas demand is projected at ~600/700 MMSCMD by 2030.**

- SAGE is proposing to construct an international energy corridor MEIDP - a Deep-Water Transnational Gas Pipeline from Middle East (UAE-Fujairah or Oman as two possible start points) to India via the Arabian Sea.

  - Capacity: 31.1 MMSCMD, Length: 1200- 1598 km, 28”-24” inch diameter & Max depth: 3,420 m

- Technological Feasibility of MEIDP has established by EIL, DNV-GL & Peritus.

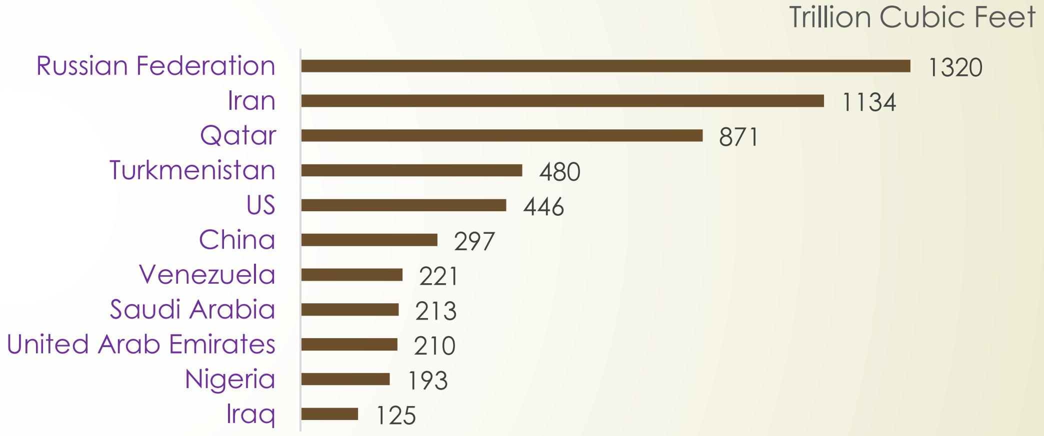
  - Vessels capable of installing pipelines for the MEIDP Project are available (from All-seas and Saipem).
  - Indian and European pipe mills are capable of manufacturing pipeline as per the MEIDP dimensions & specification, as well as for the prequalification and ring collapse testing trials.
  - Preliminary Engineering & Cost Estimate Study has been concluded by Peritus International in March’2023.
  - “As-Built” Project Cost estimate for Dual ID is $7.36 Billion (Debt: Equity Ratio 2:1)

- **Levelized Tariff of USD 2.37/ MMBTU, based on Target Equity IRR of 12%**
- **Levelized Tariff from Oman to India is $ 1.79/ MMBTU**
- **Considering LNG- Liquefaction, Transportation & Re-Gasification costs of $4.5-5.0/ MMBtu,**
- **Gas via the MEIDP pipeline will be more economical by $2.0–2.5/MMBtu in comparison to R-LNG. Estimated annual NATIONAL savings of an estimated $1 Billion.**
- **MEIDP mitigates the geopolitical risks associated with overland pipelines and is strategically positioned outside Strait of Hormuz and the Red Sea.**

MEIDP | INDIA'S DEMAND & AVAILABILITY OF MULTIPLE SUPPLY CHANNELS

- **Availability of Gas**
  - **Over 2,000 TCF of Natural Gas** is held by the countries with which India has trading relationships
  - **New Gas finds** in UAE and Saudi Arabia
  - **Gas Rich Middle East Countries** looking for **new export markets**

Largest Proved Natural Gas Reserves holders



India needs natural gas from multiple sources including Domestic production, LNG and Transnational Gas Pipeline to meet its Energy Security and Vision of 'Viksit Bharat by 2047'.

Source: BP Statistical Review of World Energy, National Energy Policy (NITI Aayog), PNGRB

Note: 1 MMTPA= 3.60 mmscmd; 1 BCM = 2.74 mmscmd; 1 mmscmd= 12.9 BCF

MEIDP | COST COMPETITIVENESS (TRANSNATIONAL PIPELINE V/S R-LNG)

RLNG and Transnational Gas Pipelines

- RLNG : Liquefaction – Transportation – Regasification of Gas attributes extra cost in the range of ~USD 2.0 – 4.0/MMBtu
- Transnational Gas Pipeline can act as a catalyst in the development of a permanent International Gas & Energy Corridor

MEIDP Pipeline Tariff – Fujairah (Start Point)		RLNG Liquefaction and Transportation	
Particulars	**Pipeline Tariff**	**Particulars**	**Contracted Tariff (USD/ MMBtu)**
Pipeline Tariff	**2.37**	Liquefaction Cost*	2.96-4.73
		Transportation Cost*	0.67-1.60
		Re-Gasification Cost*	0.82
Transportation Cost	**2.37**		**4.44-7.15**

Gas from MEIDP pipeline expected to be cheaper by ~USD 2.0–4.0/MMBtu compared to R-LNG

LNG Value Chain (Liquefaction – Transportation – Regasification) adds extra cost to the final landfall price

*Source: US – Energy Information Administration (EIA) Peritus International Limited
Note: Assuming Gas price at source is same for LNG v/s MEIDP

SAGE Middle East to India Deepwater Gas Pipeline

SIDDHO MAL GROUP

Affordability - MEIDP v/s Alternate Fuels in 3 Key Sectors

Particulars	Alternate Fuel	Competitive Gas Price Range (USD/MMBtu)
Power	Imported Coal	9-10
	Domestic Coal	5–6
	Gas Based	6-7
Fertilizer	Domestic Gas*	8–14
CGD- Industrial	Naphtha	16–25
	FO	12–18
	LDO	16–22

Source: Industry Research

** As per New Urea Policy 2012, price of LNG is pass-through for new Urea plants and the difference between the selling price and the cost of production at imported LNG price is reimbursed by the government as subsidy.*

Considering the savings of USD 2-4 /MMBtu over R-LNG, MEIDP can provide Long-Term Supply of Gas at affordable price for Power, Fertilizer & CGD Sectors.

The price matrix will change with a premium on cleaner sources of energy, such as gas, as climate pressures mount.

MEIDP | COST COMPETITIVENESS

SAGE Middle East to India Deepwater Gas Pipeline
SIDDHO MAL GROUP

RLNG and Transnational Gas Pipelines

- **Transnational Gas Pipeline can act as a catalyst in the development of a permanent International Gas/Energy Corridor**
- **RLNG : Liquefaction – Transportation – Regasification of Gas attributes extra cost ~USD 2.0 /mmbtu**

(USD/mmbtu)

MEIDP Pipeline Tariff – Fujairah Case		RLNG Liquefaction and Transportation	
Particulars	**Pipeline Tariff**	**Particulars**	**Contracted Tariff**
Pipeline Tariff	**2.37**	**Liquefaction Cost***	2.96
		Transportation Cost*	0.67
		Re-Gasification Cost*	0.82
Transportation Cost	**2.37**		**4.44**

*Source: Peritus International Limited

Note: Assuming Gas price at source is same for LNG v/s MEIDP

Gas from MEIDP pipeline expected to be cheaper by ~USD 2.0 mmbtu compared to R-LNG

MEIDP | Established Technical Feasibility

Pre- FEED → FEED → Detailed Design → Construction → Commercial Operations

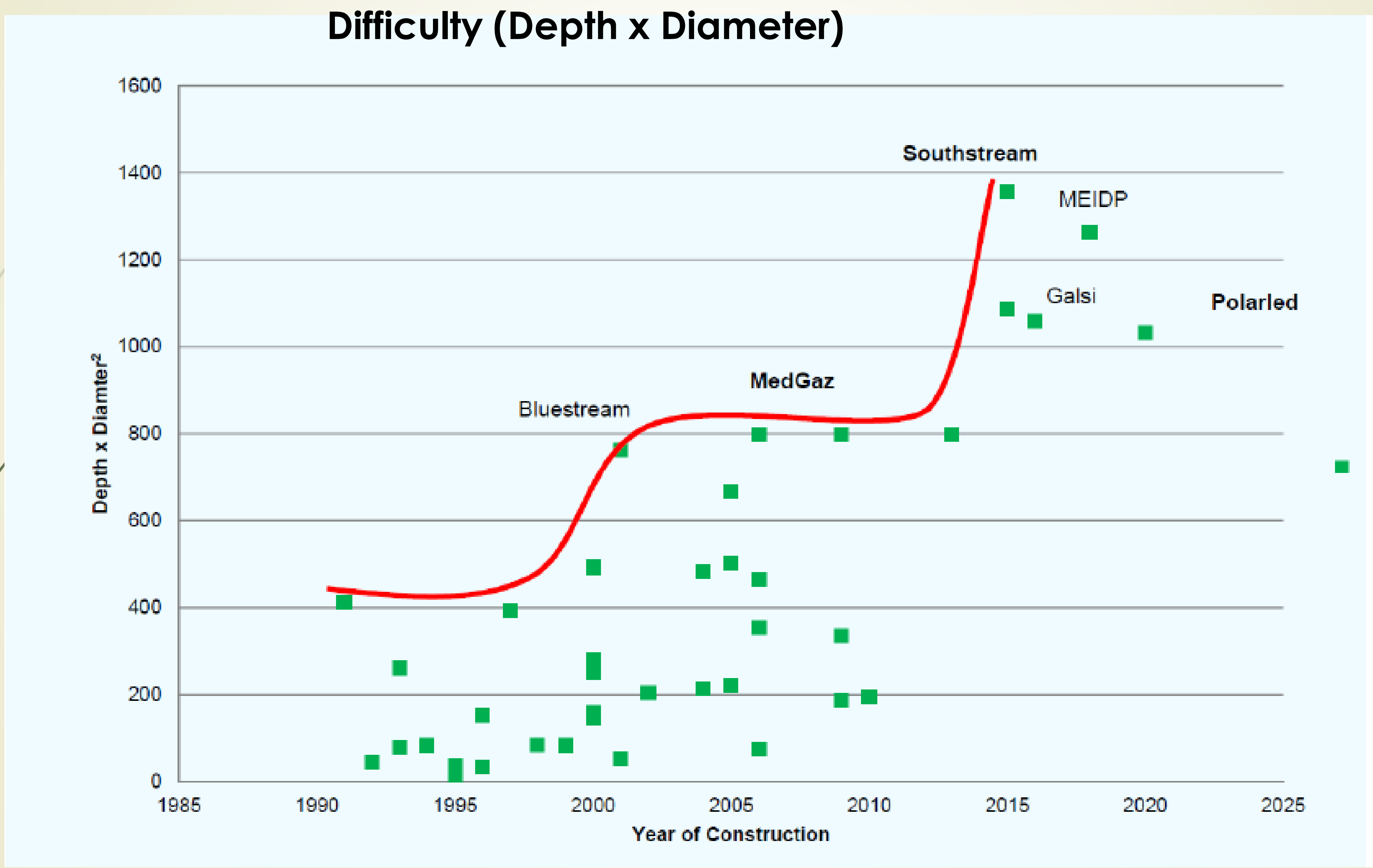
"With the right vessel, as you go deeper it gets easier"

Capable Installation Vessels

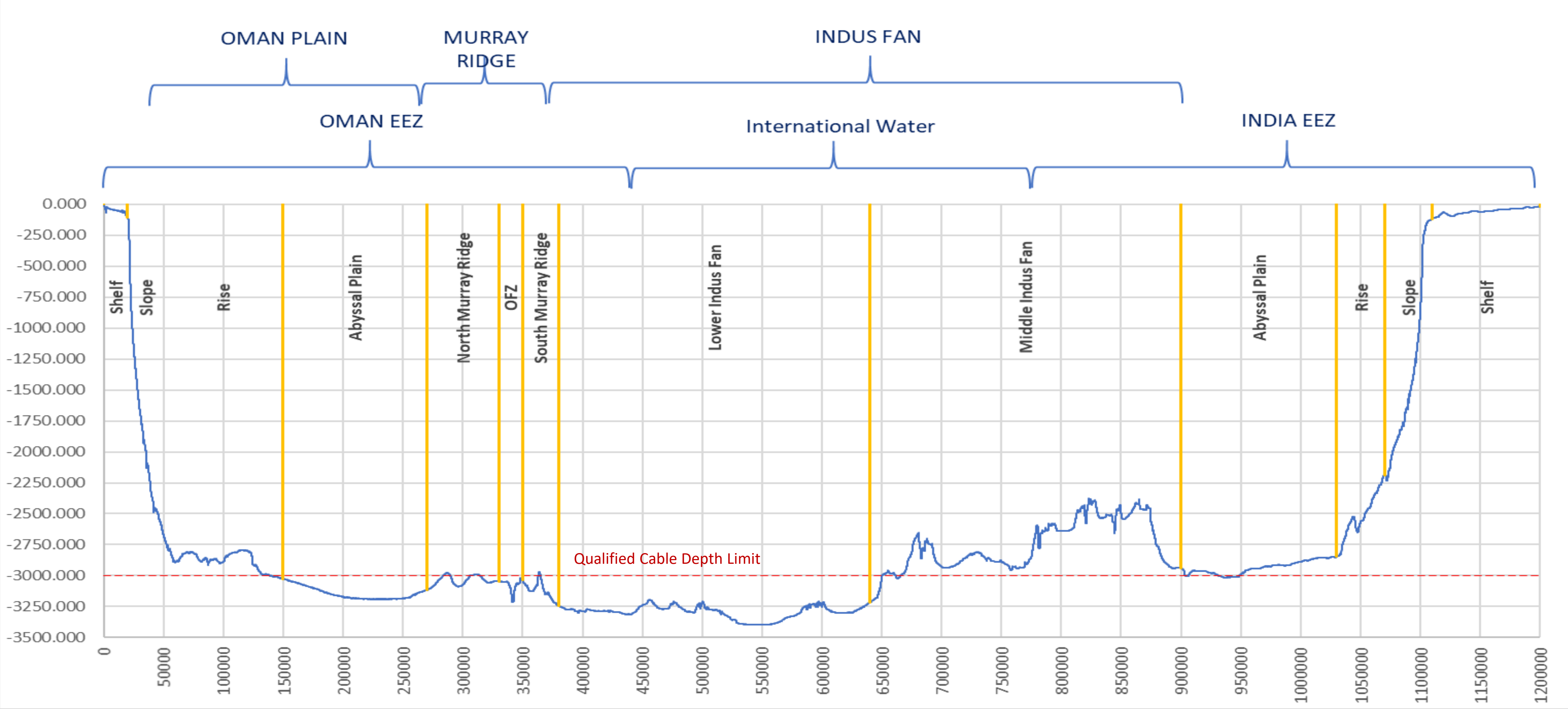
Four vessels are capable of installing the pipeline in maximum water depth of MEIDP Project

- Allseas and Saipem have confirmed that their vessels can install the pipelines for MEIDP project.
- Allseas has laid Turkstream 2,200m WD, 900 km and 32" OD in 2025.
- Saipem has laid Medgaz (220km) in 2008 and Bluestream (500km) in 2200m WD and 24" OD in 2003.

MEIDP | Difficulty of Deep Pipelaying Project



MEIDP | ROUTE CHARACTERISTICS



SAGE Middle East to India Deepwater Gas Pipeline

SIDDHO MAL GROUP

Feasibility Confirmed / Qualification Plan Endorsed

इंजीनियर्स इंडिया लिमिटेड (भारत सरकार का उपक्रम)

ENGINEERS INDIA LIMITED (A Govt. of India Undertaking)

पंजीकृत कार्यालय : इंजीनियर्स इंडिया भवन, 1, भीकाएजी कामा प्लेस, नई दिल्ली–110066

Regd. Office : Engineers India Bhavan, 1, Bhikaiji Cama Place, New Delhi-110066

Page 1 of 3

No. SAGE/B028/1704

Date: 27th October'2017

South Asia Gas Enterprise (SAGE)
Siddhomal Group
A-6, Connaught Place
New Delhi-110001

Kind Attn: Mr S.K. Jain, Director, South Asia Gas Enterprise (SAGE)

Reference: EIL Proposal No MKTG/SHM/A943/REV.0 dated 13th January 2017 and email dated 04.02.2017 from SAGE

Subject: Preparation of Pre-Feasibility Report for Middle East to India Deep water Pipeline, EIL Job No. B028 – **Submission of Report.**

Dear Sir

Attached please find the Pre-Feasibility report for Middle East to India Deepwater Pipeline (MEIDP), a transnational pipe line infrastructure to transport 31.1 MMSCMD processed natural gas from Iran to the western coast of India near Porbandar. The transported gas will be received at Gujarat Pipeline Receiving Terminal (GPRT) in the western coast of India in Porbandar district. The natural gas received at GPRT, shall be taken to different markets, across the length and breadth of India, by onshore pipeline interconnecting GPRT with existing gas network.

In line with various meetings held between SAGE and EIL, following route options have been studied.

- **OPTION-1:** Deepwater pipeline route from Iran to India to transport 31.1 MMSCMD gas.
- **OPTION-2:** Offshore pipeline route from Iran to Oman and then deep water pipeline route from Oman To India including onshore pipeline route in Oman to transport 56.1 MMSCMD gas from Iran to Oman out which 25 MMSCMD gas to be supplied to Oman and remaining 31.1 MMSCMD gas to be transported to India.

The route Option-2 (via Oman) has been further divided into following three alternatives:

➢ **Option-2a** : Offshore pipeline from Kooh Mobarak (Iran) to Sohar (Oman), then onshore Pipeline from Sohar to Al Hadd (Oman) and then finally deep water pipeline from Al Hadd to Porbandar (India).

सर्व शिक्षा अभियान

DNV·GL

STATEMENT OF FEASIBILITY

Statement No.: 2017-0553

This is to state that

Middle East to India Deepwater Pipeline

has been evaluated in accordance with DNVGL-RP-A203 /1/ as reported in DNV GL Technical Report 2017-0553 /3/. DNV GL considers the technology required to successfully execute the project to be feasible as defined in DNVGL-SE-0160 /2/ and thereby the project is suitable for further development and qualification.

Owner: South Asia Gas Enterprise PVT. LTD.

Description: Deepwater Pipeline from Middle East to India

Involvement: DNV GL has been involved in the qualification process as required in /2/ and has facilitated and documented the technology qualification process as described in /3/.

Limitations: The statement of feasibility is limited to this projects and its qualification basis.

Reference documents:
/1/ DNVGL-RP-A203, Technology Qualification, June 2017
/2/ DNVGL-SE-0160, Technology qualification management and verification, 2015
/3/ DNV GL Report no. 2017-0553, Technology Qualification of Middle East to India Deepwater Pipeline

The qualification process is in progress and new sources of uncertainty might be discovered as qualification progresses. Attention is drawn to the iterative nature of the technology qualification process /2/.

Issued at Høvik on 2017-09-11

for DNV GL AS

Olav Aamlid
Senior Principal Specialist

Olav Fyrileiv
Technology Leader

Project Cost Comparison *(In $ Million)*

Particulars	Oman-India	Fujairah-India
Material Procurement	2,111	2,863
Construction	1,455	1,976
Pre-commissioning & Commissioning	53	53
Engineering, Design & Project Management	229	250
Insurance, Certification and Inspection	90	122
Contingency (~19% of Total Core Cost)	964	1,223
Total Hard Cost	**4,902**	**6,487**
Interest during Construction period	659	872
"As-Built" Project Cost	**5,561**	**7,359**

Source: Peritus/ Company

Higher Project cost for Fujairah- India Case due to:-

- ✓ **High Fujairah-India route length of ~1595 km, v/s Oman-India of ~1188 km.**
- ✓ **Oman case is based on single constant ID pipeline with 400 barge inlet pressure, as compared to dual ID pipeline of Fujairah.**

MEIDP | OPERATIONAL SUBSEA GAS PIPELINES

BLUE STREAM

Russia to Turkey
385 KM, WD 2150 Meters
Operational in 2003

TURKSTREAM

Russia to Turkey
930 KM, WD 2,200 Meters
Operational in 2020

MEDGAZ

Algeria to Spain
210 KM, WD 2150 Meters
Operational in 2008

Norway continues to supply over **300 MMSCMD gas** to UK & Europe through undersea gas pipelines annually.

BENEFIT

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- To become 15% gas-based economy, country need to import 700/800 mmscmd gas.
- India must develop 2–3 transnational oil and gas pipelines outside the Straits of Hormuz to ensure long-term energy security.
- MEIDP project is critical to the success of India’s “Make in India” initiative and aligns with the goals of “Atmanirbhar Bharat.”
- The Project would need almost a million tons of Steel pipes, bulk of which can be made in India by Gujarat Pipe Mills

GOVERNMENT SUPPORT

- **SAGE is already under discussion with international gas suppliers for strategic investments and long-term gas supply agreements with India. We welcome Indian Public & Private Sector Enterprises, as well as global enterprises in the oil & gas sector, under the guidance of GoI/MoPNG, to participate in this connectivity project to form a global consortium that will play a monumental role in national energy security and development.**

- **Support sought from The Government of India/MoPNG/MoCF/MoP/MEA**

  - **Power & Urea companies & CGD enterprises could consider long term offtake of gas and act as anchor investors in the MEIDP Project.**
  - **We further request the MoPNG & Oil, Gas Cos like GAIL/OVL/ONGC and other entities in these fields to review the SAGE & MEIDP Project keeping global and current geopolitical conditions in mind and support us.**
  - **We humbly urge the MoPNG/MEA/PMO to officially take on record the MEIDP Project and extend political support to it in all their official and diplomatic interactions with Oman & UAE.**
  - **MEIDP Project can provide exciting possibilities to companies like OVL to invest in Discovered and Producing Gas Fields in UAE & Oman etc. to further ensure gas availability for the project and give more comfort to lenders in the project. Gulf countries and companies would then also be willing to invest in such projects.**

WIN FOR INDIA

- India as growing economy needs access to affordable, safe & secure transnational gas pipelines to fuel a growing economy and provide energy security.
- Transnational gas pipelines like MEIDP will reduce heavy dependence on LNG from Qatar, Australia, and USA.
- Reliable commercial tie-ups with a major player in Middle East further improve international trade relations.
- Each MEIDP pipeline may potentially deliver 1.1 BFCD (31.1MMSCMD), saving billions of USD annually by way of subsidies.
- Potential savings of ~Rs 3,196 Cr every year in subsidy outgo with 50% of capacity utilization by Fertilizer sector in India.
- Access to pipeline gas helps moderate competition from LNG benefitting the end consumer and several industries.
- Supply of transnational pipeline gas will reduce landfall gas prices thereby leading to increase in gas demand from primary sectors.
- Availability of long-term supply of affordable gas for greenfield projects in primary sectors like Power & Fertilizer.
- Projects of national interest further helps GoI with the "Make in India" plan and a vision of "USD 5 Trillion Economy" and move closer to an Atmanirbhar Viksit Bharat.

SEEKING SUPPORT FROM THE INDIAN GOVERNEMENT

- MEIDP Project will be a monumental achievement for India to showcase to the world that we can be on par with Europe and the USA and manage our energy independence, making us self-reliant.
- Without GOI support, it will be tough to implement such geo-political projects as long-term gas contracts always involve national government and government organizations.
- Considering long term availability of affordable natural gas - Fertiliser, Power & CGD sectors in India can become anchor off-taker of Gas from MEIDP, making transnational gas pipelines flourish
- India needs at least 2-3 transnational pipelines for Oil & Gas for energy security.
- The MEIDP Project avoids the Strait of Hormuz and The Red Sea, both volatile regions, keeping regional geo-political stability in mind.
- The MEIDP Project consortium is open to and welcomes strategic Public Sector and Pvt Partnerships to form global alliances in the working towards national interest and we are prepared to develop this project as per MoPNG guidelines & associate our public sector Oil & Gas companies with it too.

Way Forward

- Assocham to give recommendations to Government for having Transnational Pipelines
- A feasibility Study to be done by leading consultant
- Desire to Do – Yes – India to have transnational pipelines for Gas Sourcing

Think ………

Make the Gas available
from
Transnational Pipelines
and
be part of

“Good To Great India”