

HIGH LEVEL COMMITTEE- VISION 2040 - NATURAL GAS INFRASTRUCTURE IN INDIA

NEED OF TRANSNATIONAL GAS PIPELINES IN MEETING ENERGY DEMAND

SAGE
Middle East to India
Deepwater Gas Pipeline


SIDDHO MAL
GROUP

13th August 2024

Strictly Private & Confidential

FLOW OF DISCUSSION

1

Overview – SAGE & Transnational Gas Pipeline (MEIDP)

2

Demand and Supply Overview

3

Infrastructure Development

4

Key Enablers of Transnational Gas Pipelines

5

SAGE- MEIDP Project Progress

6

Key Considerations & Support from PNGRB

MIDDLE EAST TO INDIA DEEP-WATER GAS PIPELINE (MEIDP)

- SAGE is planning to build Middle East to India Deep-Water Gas Pipeline (**MEIDP; Transnational Gas Pipeline**) from Middle East (UAE-Fujairah, Oman) to India , via Arabian Sea.
 - ❑ Capacity: 31.1 MMSCMD, Length: 1200- 1598 km, 28”-24” inch diameter & Max depth: 3,420 m
- **Technological Feasibility** of MEIDP is established by Peritus & earlier by EIL, DNV-GL
 - ❑ Vessels capable of installing pipelines for MEIDP project are available (Allseas and Saipem)
 - ❑ Indian and European Pipe mills are capable of manufacturing pipeline for MEIDP Dimensions/ Specification, prequalification and ring collapse testing trials
 - ❑ Preliminary Engineering & Cost Estimate Study has been concluded by Peritus International in Mar’2023
 - ❑ Total Core Project Cost estimated for Single ID is USD 6.07 Bn.
 - ❑ “As-Built” Project Cost for Dual ID works out to **USD 7.36 Bn** (Debt:Equity Ratio 2:1)
- Levelized Tariff of **USD 2.37/ MMBTU**, based on target Equity IRR of 12%
- Considering, LNG- Liquefaction, Transportation & Re-gasification costs of **~USD 4.5-5/ MMBtu**, Gas from MEIDP pipeline to be **cheaper by ~USD 2.0–2.5/mmbtu compared to R-LNG. Potenetial annual savings approx. USD one billion.**
- **MEIDP mitigates the geopolitical risks associated with overland pipelines.**
- SAGE is already under discussion with Gas suppliers for investment and long-term gas supply

PROJECT VISION

Project

Middle East to India Deep-Water Gas Pipeline (MEIDP)

Sponsor

South Asia Gas Enterprise Pvt Ltd (SAGE)
The Group has over 50 years of experience in Indian industry & Project Development

Proposal

Development of an Energy Corridor for transportation of Natural Gas from Middle East to India by the safest, most economical and reliable means

Proposed Route

Middle East Landfall (UAE-Fujairah, Oman) to India Landfall (Gujarat), via 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 USD 20 Mn on the MEIDP Project**

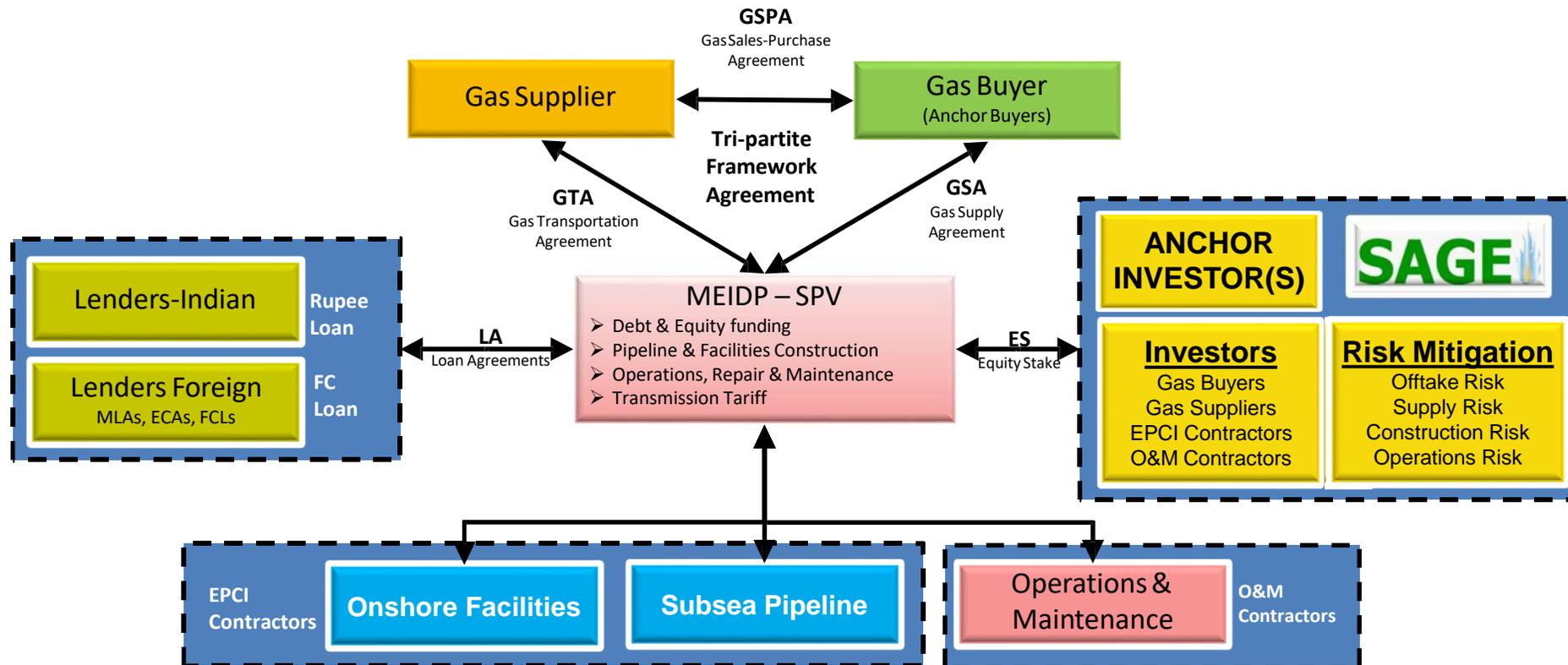
PROJECT DETAILS

Start Point	UAE (Fujairah)/ Oman
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	3,420 m
Length	1200 km - 1,598 km
Steel Tonnage	800,000 tonnes (approx.)
Implementation Period	5 years (as Fast Track)
Pipeline Laying Time	2 years
Approx. Cost	USD 7.36 Bn

SAGE KEY TEAM MEMBERS/ TECHNOLOGY PARTNERS

Name	Role	Name	Role
Mr T. N. R Rao	<ul style="list-style-type: none"> - Former Petroleum Secretary, Govt of India - Architect of Oman-India Pipeline - Chairman of SAGE Advisory Board 	Dr Ping Liu	- Operations Director, Intecsea BV, Netherlands
Mr Subodh Jain	<ul style="list-style-type: none"> - Director South Asia Gas Enterprise PVT Ltd. - Director Siddho Mal & Sons and Director INOX Air Products Ltd. - Former Senior Advisor to Oman-India Pipeline 	Mr Marco Monopoli	- Offshore Commercial Manager Saipem SpA, Milan, Italy
Mr Ian Nash	<ul style="list-style-type: none"> - Group Managing Director, Peritus International. and Senior Technical - Consultant to SAGE - PM for Detailed Design of Europipe 2 Gas Trunkline and BP Block 31 ultra deep flowlines - PM for MedGaz FEED Ultra Deep Trunklines - EM for Canyon Express Ultra Deep development 	Mr Johan Drost	- Allseas International, Delft, Netherlands Vice President, Commercial
Mr AK Purwaha	<ul style="list-style-type: none"> - Former Chairman & Managing Director of Engineers India Ltd (EIL) - Member of the SAGE Advisory Board 	Mr Asle Venas	- Global Director of Pipelines DNVGL
Mr. D.P Srivastava	<ul style="list-style-type: none"> - Former Ambassador to Iran - Ex-Director, Gail - Ex-Director, India Ports Global Ltd (Chabahar port) - Former Senior Advisor to OVL 	SBI Capital Markets Ltd	- Financial Advisory Services
Dr Roberto Bruschi	<ul style="list-style-type: none"> - Senior Vice President Subsea & Sealines Saipem SpA, Milan, Italy 	Engineers India Ltd	<ul style="list-style-type: none"> - Leading Onshore Pipeline and Facilities Engineering - SAGE Indian Design Consultants
		Ernst & Young	- Financial Advisory Services

PROJECT STRUCTURE



- Offshore SPV to be incorporated based on tax implications of different geographies in the world
- Project de-risked through the involvement of multiple global stakeholders who have the capability to implement this project
- Most Transnational Gas pipelines have Gas Suppliers/ Off-takers as Equity stakeholders
- This ensures stronger and active role of Stakeholders from both Gas Supplier and Gas Off-taker countries
- Equity stake of major stakeholders also ensures long term sustainability and bankability of transnational gas pipeline project

FLOW OF DISCUSSION

1

Overview – SAGE & Transnational Gas Pipeline (MEIDP)

2

Demand and Supply Overview

3

Infrastructure Development

4

Key Enablers of Transnational Gas Pipelines

5

SAGE- MEIDP Project Progress

6

Key Considerations & Support from PNGRB

- Govt. of India aims to increase Gas share 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 Gas demand of 700/750 mmscmd by 2030.**
- Vision for **‘Viksit Bharat by 2047’** requires adequate energy to sustain India's growth trajectory. Climate change will be a major driver for energy transition in which natural gas can play a major part
 - ❑ Reducing the carbon footprint of the economy will require increased use of gas directly (for power generation) and indirectly (to provide balancing power for renewables)
- India needs **additional gas** from domestic production & imports to meet target energy mix
 - ❑ **Dependence on RLNG to continue** in lieu of falling domestic gas output at more than 50% of total gas supply
 - ❑ India is **heavily dependent on LNG from Qatar, Australia, and USA and needs access to more options**
 - ❑ However, imports of LNG are not sufficient to meet the demand for natural gas.
 - ❑ **Landed cost of RLNG is presently affordable by only few sectors**
- India requires **robust gas import infrastructure, including multiple supply channels** to meet its increasing gas demand at affordable prices.
- At least 3 transnational gas pipelines are needed in next 10/12 years to bring 100 mmscmd gas from the Gulf countries.
- Availability of transnational pipeline gas help to moderate volatile LNG prices, as was seen in Europe & China since last 10 years. Non-availability of Russian pipeline gas almost doubled gas prices in Europe since Ukraine crisis.

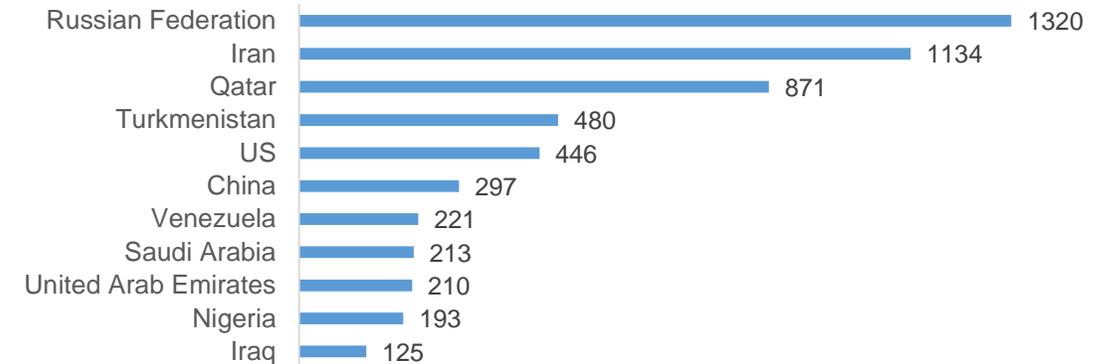
INDIA'S NATURAL GAS DEMAND & NEED FOR MULTIPLE SUPPLY CHANNELS

➤ 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

Trillion Cubic Feet



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'.

FLOW OF DISCUSSION

1

Overview – SAGE & Transnational Gas Pipeline (MEIDP)

2

Demand and Supply Overview

3

Infrastructure Development

4

Key Enablers of Transnational Gas Pipelines

5

SAGE- MEIDP Project Progress

6

Key Considerations & Support from PNGRB

PROJECT FEASIBILITY STATEMENTS

Page 1 of 3

इंजीनियर्स इंडिया लिमिटेड
ENGINEERS INDIA LIMITED
(भारत सरकार का उपक्रम)
(A Govt. of India Undertaking)
पंजीकृत कार्यालय : इंजीनियर्स इंडिया भवन, 1, भीकाली कामा प्लेस, नई दिल्ली-110066
Regd. Office : Engineers India Bhavan, 1, Bhikaji Cama Place, New Delhi-110066

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 of 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

अकृष्टता का आधार – हमारे धर्मो

DELIVERING EXCELLENCE THROUGH PEOPLE

फोन : { 91-11-26782121 (EPBAX) फैक्स : { 91-11-26186245 Visit us at <http://www.engineersindia.com>
Phone : { 91-11-26782121 (EPBAX) Fax : { 91-11-26186245
CIN: L74899DL1965GO1004352 हिन्दी देश की एकता की कड़ी है।





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

ESTABLISHED TECHNICAL FEASIBILITY



Capable Pipe Mills

- ✓ Two pipe mills (Jindal SAW & PCK) have manufactured pipeline specifically for SAGE to MEIDP Dimensions and Specification. (24"ID, 40.5mm WT, $a_{Fab} = 1.0$)
- ✓ Three pipe mills (Jindal SAW, WELSPUN & PCK) have successfully completed prequalification and ring collapse testing trials
- ✓ JFE and Europipe are currently undertaking similar production and prequalification/testing trials.



**MAKE IN INDIA – India can make a substantial part of 800,000 tonnes of Pipe
Value approx. Rs.7500/8000 cr.**

ESTABLISHED TECHNICAL FEASIBILITY



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
 - Saipem has laid Medgaz (220km) and Bluestream (500km) in 2200m WD and 24” OD

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

PROJECT BASIS

➤ PRE-FEED BASIS

- Nominal Design annualised average throughput 1Bscfd
- Maximum Operating Pressure at Inlet 400Barg
- Maximum Assumed Inlet Temperature 50°C
- Minimum Arrival Pressure In India 50barg
- Downtime Maintenance allowance 10%
- Design Peak throughput objective 31.1MMScmd / 1.1Bscfd

➤ Oman – India Base Case (PRE-FEED)

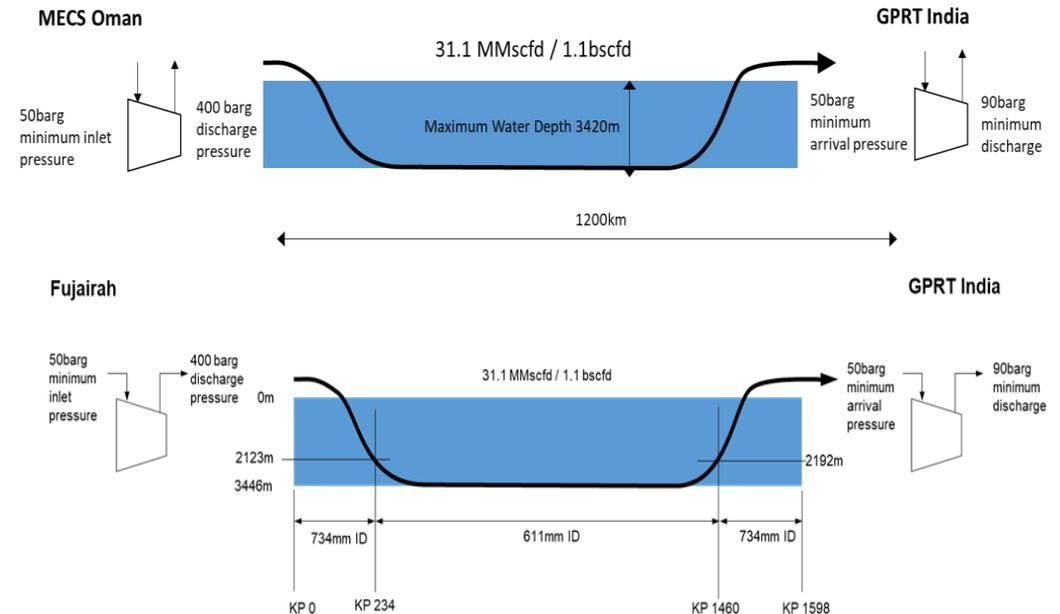
The Design of a direct pipeline from Landfall in Oman (Ra's al Jifan) to Landfall in India (Gujurat) Constant 610mm ID Pipeline has been studied extensively by SAGE between 2010 and 2020 and was the basis of DNV's Endorsement of the technical feasibility of the project

➤ UAE – India Option (Concept Study)

In 2022 SAGE was requested by ADNOC to consider the option of supplying Gas to India by a direct pipeline from Fujairah to India

Design Code DNV-ST-F101

Material Grade DNV485 SAW DUF



OTHER OPERATIONAL & ONGOING ULTRA DEEP-WATER PIPELINES

Project	Location	Year	Water depth (m)	Length (km)	Size	Product
Canyon Express	GOM	2002	2200	180	12"	Gas
Blue-stream	Russia-Turkey	2003	2150	385	24"	Gas
Medgaz	Algeria -Spain	2008	2150	210	24"	Gas
Cascade Chinook	GOM	2009	2680	19	9"	Oil
Mardi Gras	GOM	2009	2150	528	16"-28"	Gas
Perdido	GOM	2009	2961	10	10"	Oil
Jack St.Malo	GOM	2013	2200	220	24"	Gas
Route 1	Brazil	2011	>2126	250	18"-34"	Gas
Cabiunus	Brazil	2016	>2126	401	24"	Gas
Rota 3	Brazil	2023	2450	355	20"-24"	Gas
TurkStream	Russia -Turkey	2020	2200	930	32"	Gas
Galsi	Algeria-Italy	Cancelled	2800	565	26"	Gas
Eastern Med	Israel - Greece	Stalled	3200	1880	24"-28"	Gas
BM-C-33	Brazil	EPIC Tendering	2735	200	22"-24"	Gas

DEEP SEA PIPELINE WORLD SCENARIO

➤ Long Distance Subsea Gas Pipelines are Safe and Reliable Worldwide

➤ Operational Pipelines (>400 Km)

- ❑ Nordstream 1 - 1,224 km 48" 2 off {Russia ->Germany}
- ❑ Nordstream 2 - 1,224 km 48" 2 off {Russia ->Germany}
- ❑ FranPipe 840 km 42" {Norway -> France}
- ❑ ZeePipe-I 813 km 40" {Norway -> Belgium}
- ❑ Europipe-I 620 km 40" {Norway -> Germany}
- ❑ Langeled 1166 km 42" {Norway -> UK}
- ❑ Gulfstream 1200 km 36" {Alabama -> Florida, USA}
- ❑ West Africa Pipeline 569 km 20" {Nigeria -> Benin -> Togo -> Ghana}
- ❑ Malampaya 504 km 24" {Malampaya -> Philippines}
- ❑ West Natuna Gas Pipeline 654 Km 28" {South China Sea -> Singapore}
- ❑ Europipe-II 658 km 42" {Norway -> Germany}
- ❑ Yacheng 13-1 gas pipeline 780 km 28" {South China Sea -> Hong Kong}
- ❑ Polarled 482 km 36" {Arctic Circle -> Norway}
- ❑ Turkstream 930km 32" {Russia -> Turkey}
- ❑ Baltic Pipe 900km {Norway -> Poland}
- ❑ Asgard Transport 707km 42" {Asgard B -> Norway}
- ❑ FLAGS 450km 36" {Brent A -> UK}

FLOW OF DISCUSSION

1

Overview – SAGE & Transnational Gas Pipeline (MEIDP)

2

Demand and Supply Overview

3

Infrastructure Development

4

Key Enablers of Transnational Gas Pipelines

5

SAGE- MEIDP Project Progress

6

Key Considerations & Support from PNGRB

SECTOR-WISE AFFORDABILITY OF NATURAL GAS IN INDIA

Transnational Pipeline Gas is expected to be cheaper by ~USD 2.0–2.5/mmbtu compared to R-LNG

- ❑ MEIDP would focus on catering to demand for natural gas from Fertilizer, Power (Gas-based) and CGD – Industrial by providing affordable long term gas supply.

➤ Fertiliser Sector

- ❑ New/ existing fertiliser units to increase **gas demand to ~60-62 mmscmd by FY29** (~66% of demand is expected to be fulfilled through R-LNG imports)
- ❑ Availability of **affordable Transnational Gas to boost sector demand and reduce Government Subsidy outgo**

➤ Power Sector

- ❑ Potential **Gas requirement** for existing Gas based capacity is **106 mmscmd**, gas consumption was only ~20.7 mmscmd in FY23, as RLNG is not affordable for Gas based power plants.
- ❑ Availability of **affordable Transnational Gas** could boost demand from **revival of Stranded Gas based Power Plants by generating 7500/8000 MW additional power.**

➤ City Gas Distribution (CGD)

- ❑ Gas demand in CGD Sector, expected to grow at **15-20% CAGR from ~33.6 mmscmd in FY23 to ~90-95 mmscmd in FY29**
- ❑ **Expansion of CGD network and growing awareness for cleaner fuel** to aid in fuel conversion in **industrial segment and boost demand for affordable gas.**

- **Trans-National Gas Pipelines** transits through **Nations & wide variety of Terrain** for harmonizing regional demand by **linking Multiple Sources and Demand Centers**.
 - ❑ **Involvement of multiple Governments, Regulatory Bodies, National Oil Companies (NOC), Tax & Custom authorities, Legal authorities etc.**
- **Onshore Cross Country** Transnational Gas Pipelines entail **significant Geo- Political collaboration**.
- **Offshore deep-water Transnational Gas Pipelines, however,**
 - ❑ **Transcends into international waters**, thereby limiting the impact of potentially deteriorating geopolitical relations and on ground security threats
- **Technology & Reliability**
 - ❑ **Deep Water pipeline technology is available for implementing projects**
- Transnational Pipelines are successfully operating worldwide
- **Transnational Pipelines can be vital to address India's Energy Security Need**
 - ❑ **Ensure Long-Term Supply of Gas at affordable price for Power, Fertilizer & CGD Sectors**
 - ❑ **Potential to contribute towards Govt. of India "Make in India" plan and vision of "USD 5 Trillion Economy"**

FLOW OF DISCUSSION

1

Overview – SAGE & Transnational Gas Pipeline (MEIDP)

2

Demand and Supply Overview

3

Infrastructure Development

4

Key Enablers of Transnational Gas Pipelines

5

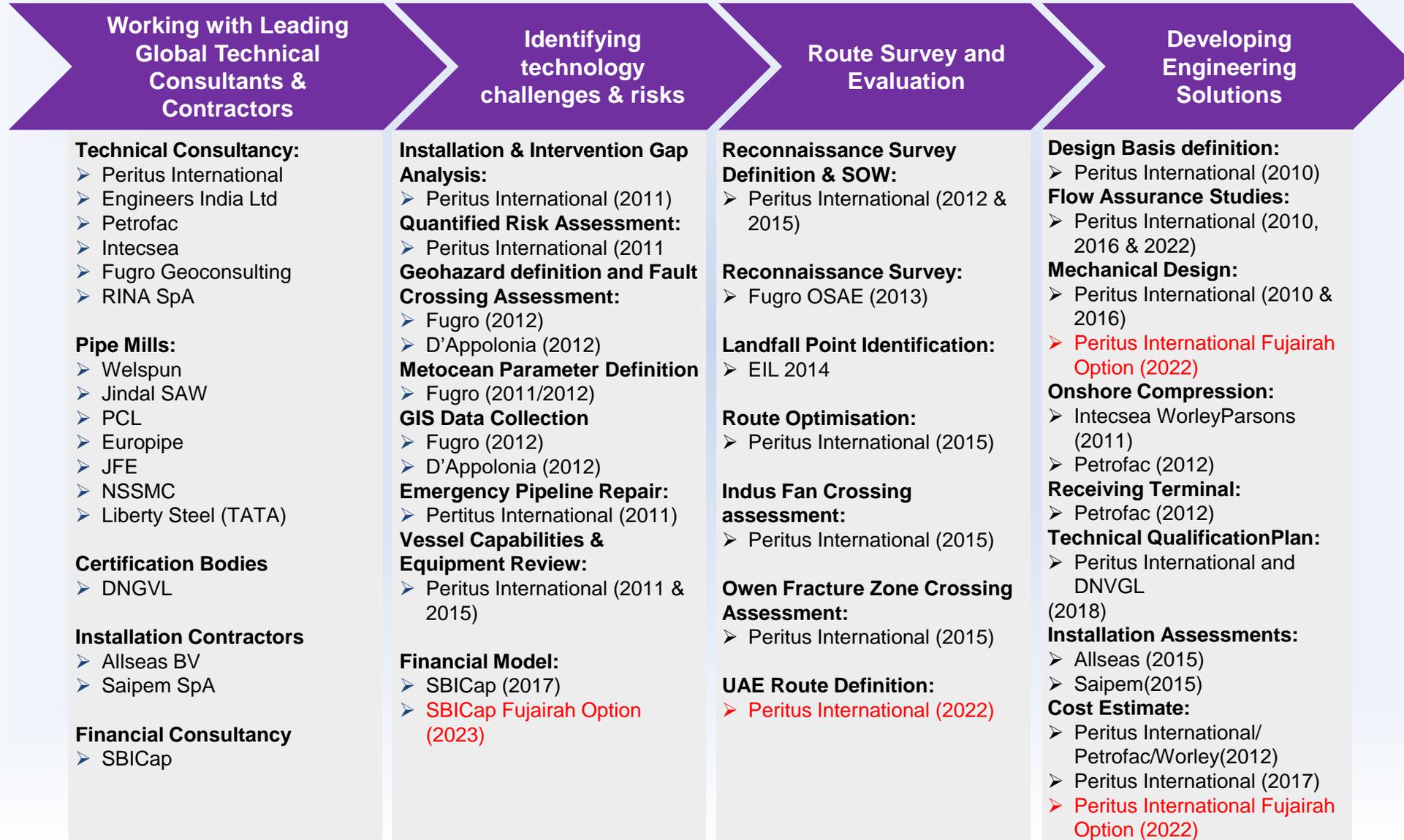
SAGE- MEIDP Project Progress

6

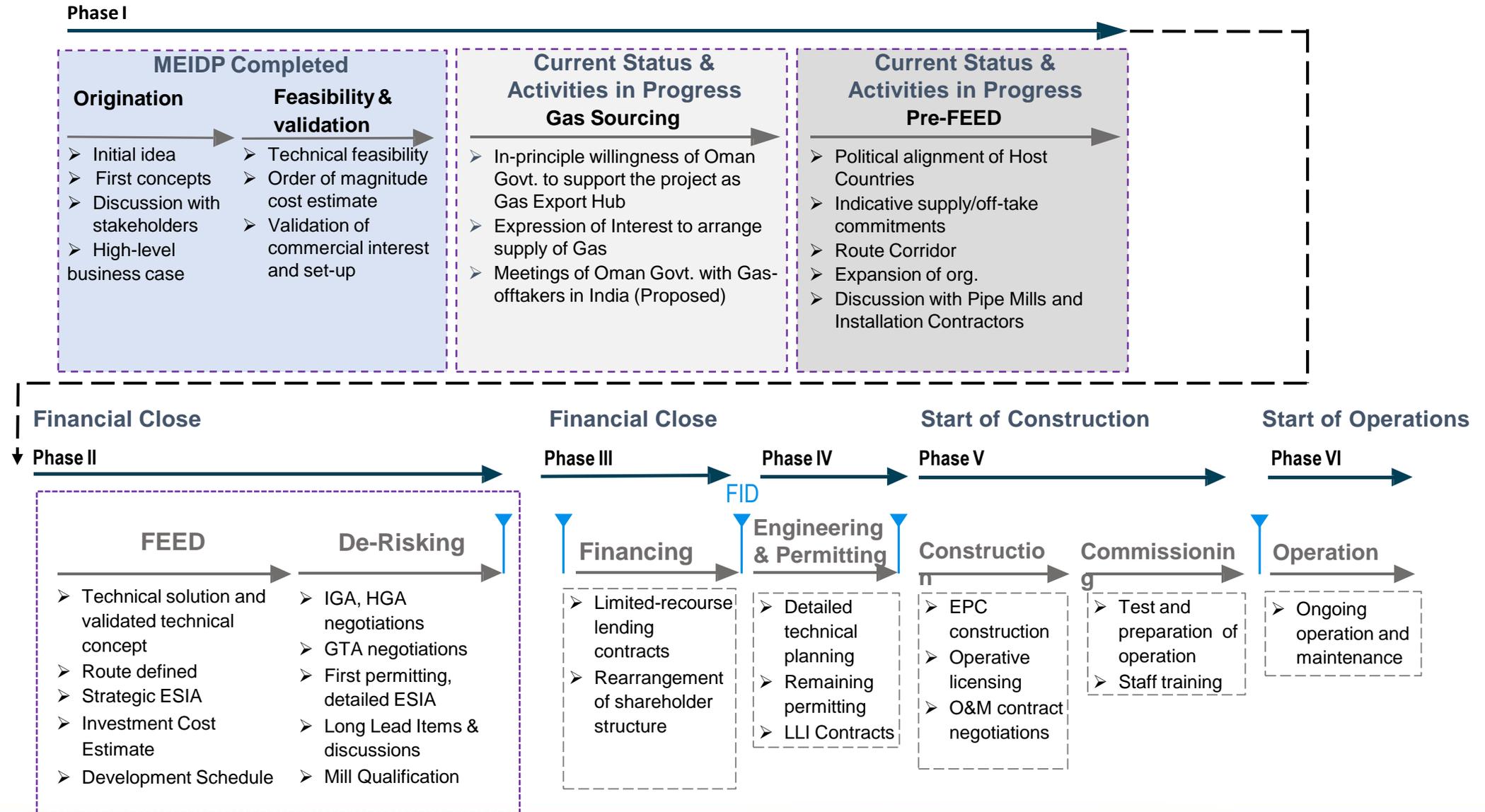
Key Considerations & Support from PNGRB

MEIDP | PROJECT DE-RISKING

Technical Viability & de-risking by DNVGL and Peritus International Limited (2022)



MEIDP PROJECT – PROGRESS SO FAR



MEIDP PROJECT – PROGRESS SO FAR

Sr No.	Work Done	Company	Year
1	Design Basis definition	Peritus International, UK	2010
2	Flow Assurance Studies	Peritus International, UK	2010
3	Mechanical Design	Peritus International, UK	2010
4	Installation & Intervention Gap Analysis	Peritus International, UK	2011
5	Quantified Risk Assessment	Peritus International, UK	2011
6	Emergency Pipeline Repair	Peritus International, UK	2011
7	Onshore Compression	Intecsea Worley Parsons	2011
8	Pipe Testing	Welspun	2011
9	Pipe Testing	Jindal Saw	2012
10	Geohazard definition & Fault Crossing Assessment	Fugro	2012
11	Geohazard definition & Fault Crossing Assessment	D'Appolonia	2012
12	Metocean Parameter Definition	Fugro	2012
13	GIS Data Collection	Fugro	2012
14	GIS Data Collection	D'Appolonia	2012
15	Reconnaissance Survey Definition & SOW	Peritus International, UK	2012
16	Onshore Compression	Petrofac	2012
17	Receiving Terminal	Petrofac	2012
18	Cost Estimate	Peritus/ Petrofac/Worley	2012
19	Reconnaissance Survey	Fugro OSAE	2013
20	Landfall Point Identification	Engineers India Ltd (EIL)	2014
21	Vessel Capabilities & Equipment Review	Peritus International, UK	2011 & 2015
22	Reconnaissance Survey Definition & SOW	Peritus International, UK	2015
23	Route Optimisation	Peritus International, UK	2015

MEIDP PROJECT – PROGRESS SO FAR

Sr No.	Work Done	Company	Year
24	Indus Fan Crossing Assessment	Peritus International, UK	2015
25	Owen Fracture Zone Crossing Assessment	Peritus International, UK	2015
26	Installation Assessments	Allseas	2015
27	Installation Assessments	Saipem	2015
28	Strategy, Roadmap & Economic Rationale	Roland Berger	2016
29	Pipe Testing	JFE, Japan	2016
30	Flow Assurance Studies	Peritus International, UK	2016
31	Technical Review Workshop	Peritus/EIL/DNV GL/ Saipem/Roland Berger/Allseas/Intecsea	2016
32	Mechanical Design	Peritus International, UK	2016
33	Financial Model	SBI Caps	2017
34	Cost Estimate	Peritus International, UK	2017
35	Statement of Feasibility	DNV GL	2017
36	Statement of Feasibility	Engineers India Ltd (EIL)	2017
37	Technical Qualification Plan	Peritus International, UK & DNV GL	2018
38	Financial Model	SBI Caps (Fujairah Option)	2022
39	UAE Route Definition	Peritus International, UK	2022
40	Flow Assurance Studies	Peritus International, UK	2022
41	Mechanical Design (Fujairah Option)	Peritus International, UK	2022
42	Cost Estimate (Fujairah Option)	Peritus International, UK	2022
43	Financial Model	SBI Caps (Fujairah Option)	2023

FLOW OF DISCUSSION

1

Overview – SAGE & Transnational Gas Pipeline (MEIDP)

2

Demand and Supply Overview

3

Infrastructure Development

4

Key Enablers of Transnational Gas Pipelines

5

SAGE- MEIDP Project Progress

6

Key Considerations & Support from PNGRB

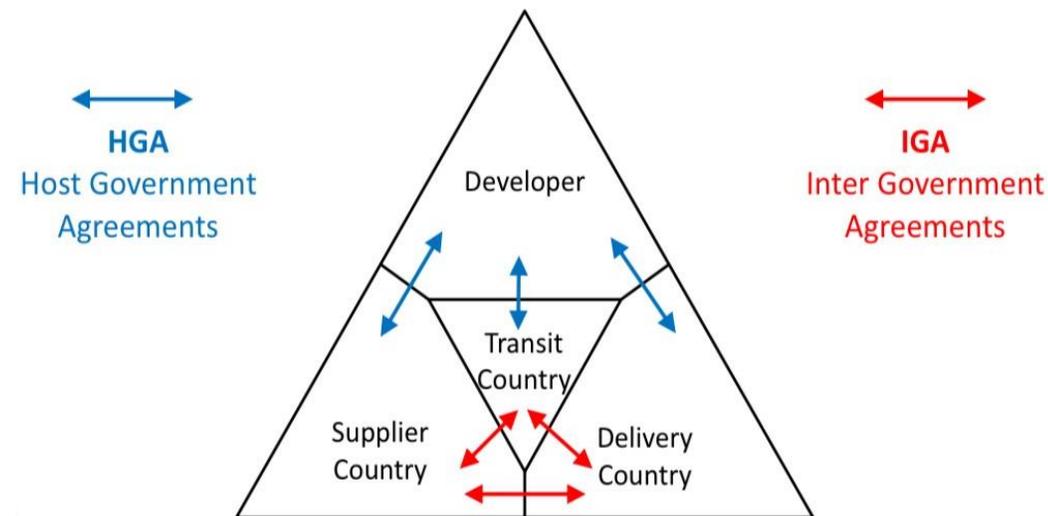
SUCCESS OF TRANSNATIONAL GAS PIPELINES KEY PROJECT DRIVERS

- Transnational Gas Pipeline (TNGP) projects are driven by both **Gas producing and Gas off-taker countries**.
- **Gas Producers** typically take **Equity stake** in the TNGP projects to derive maximum return from Gas value chain
 - ❑ This also demonstrates **strong commitment** of Gas producing **country/company** in the project
 - ❑ Provides **confidence & comfort to gas off-taker for delivery of gas** on long-term basis
- Due to participation in gas value chain, the Gas producers can have better control to **ensure smooth & uninterrupted supply of gas**
 - ❑ **Progress** of implementation of the TNGP Project
 - ❑ **Awareness** of TNGP funding tie-up/Issues
 - ❑ Update on **day-to-day** operation of TNGP Project

Strong involvement of Gas producer essential for success of any Transnational Gas Pipeline project

TRANSNATIONAL GAS PIPELINES – ELEMENTS FOR SUCCESS

- **Major dedicated volumes** of gas, which are essential for a project.
- A competent and committed **commercial champion**
- **Economic viability** of the pipeline and superiority over other alternatives
- **Political support**, which is instrumental (**Absolutely necessary**) but not decisive.



KEY CONSIDERATIONS FOR TRANSNATIONAL PIPELINE PROJECTS

Interdependence/ Synergy of Participating Govt.

- **Long Term Gas Demand/Supply outlook in Buyer/Seller nations**
- Development of an **enforceable Contractual Framework among Govt.'s**, Gas Buyers & Sellers

Consortium Lead for Project SPV

- **Anchor Investor/Promoter of International repute with experience in Pipeline sector and strong financial capabilities** needed to drive such Projects

Terrain Variance & Construction

- Wide **variety of terrain across route poses challenges in terms of Construction, Time & Costs**

Financing tie-up of Project

- **Long gestation period, high construction risk, difficulties in coordination, security enforcement risk, sourcing & demand risks and political risks** could impact financing tie-up.

Transit Taxation & Custom Duty issues

- Movement of Gas **across international borders** could attract **duties at multiple transit points** between participating Nations

Approvals under Multiple Authorities

- Project construction & operations would require various approvals & clearances from Statutory & Local bodies of participating Countries

Payment Security & Off- take certainty to SPV

- **Off-takers from multiple Countries of varying Credit Risk profile could pose challenge to the development of a robust payment & off-take Security mechanism**

Key Elements

G2G Collaboration

- **G2G involvement** is needed given the importance of the project and scale. Most transnational gas pipelines in fact involve involvement of governments given its importance for energy security

Anchor Investor

- **Anchor investment from NOCs/Gas Companies** of participating countries required for project execution and to secure project financing

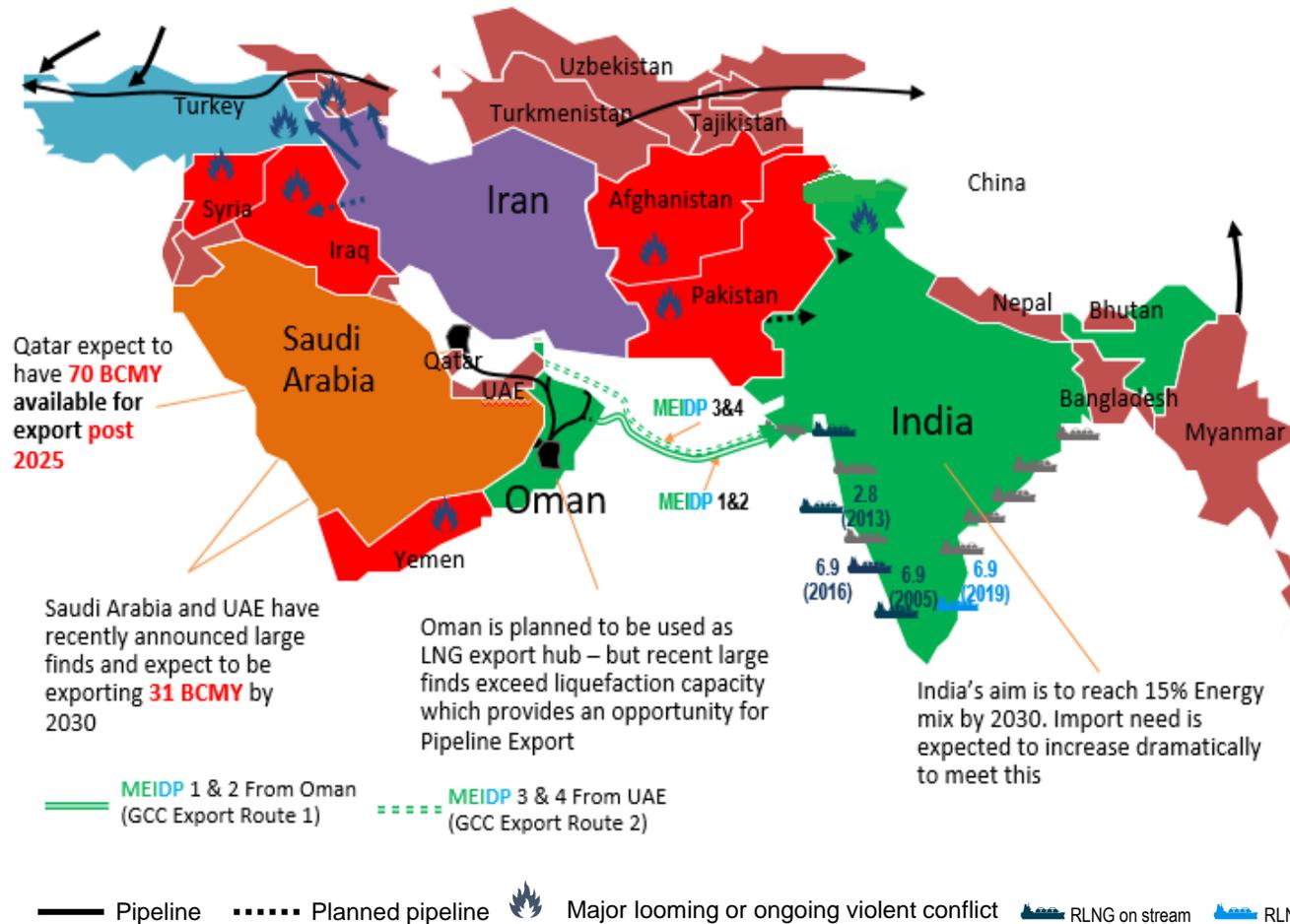
Long Term Supply & Offtake Commitment

- **Long-term supply and offtake commitments** to be firmed up amongst participating countries for **de-risking of the project for long term financing**.
 - ❑ **Supply commitments from Source country** gas players to assure committed gas supply through pipelines
 - ❑ **Offtake Commitments from Indian Companies** for assured demand and viability of pipeline project

- **Multiple channels for sourcing of gas viz. Domestic Gas, LNG & Transnational Pipeline Gas, are required to meet India's growing natural gas demand,**
 - ❑ **Transnational Gas Pipeline** can be one of the options to access **affordable gas supply** over long term.
- **Transnational Pipelines are successfully operating worldwide**
 - ❑ India can replicate same success, with **Govt. support** for fast-track evaluation and implementation.
- **Offshore deep-water transnational pipelines from gas rich Middle East** in international waters
 - ❑ Avoids conflict areas & limits impact of potentially deteriorating geopolitical relations, & limits on-ground security threats
 - ❑ **Abundant Gas available in Middle East countries**, which can be tapped through Offshore deep-sea transnational pipelines, which are safe and reliable worldwide.
- **Over last 10 years, SAGE has done considerable work/progress for development of MEIDP project,**
 - ❑ **SAGE requests PNGRB to mentor and constitute a Task Force of industry experts and natural gas off-takers to evaluate the technical and commercial aspects of MEIDP project in detail**

COMPETING INDIAN GAS IMPORT PROJECTS AND SECURITY

- To cover the increasing gas demand, India plans to expand its import infrastructure with new RLNG plants and pipelines
- **MEIDP** from Middle East is the only pipeline project catering to India markets and not crossing conflict



Pipelines help to moderate Gas prices, but the larger MENA region and South Asia generally presents a **challenging geopolitical environment** and security environment for large-CAPEX cross-border infrastructure

The offshore route of **MEIDP avoids conflicts** and limits the impact of potentially deteriorating geopolitical relations as well as **limiting on-the-ground security threats** posed by non-state actors

Working Agreements with Key Stakeholders

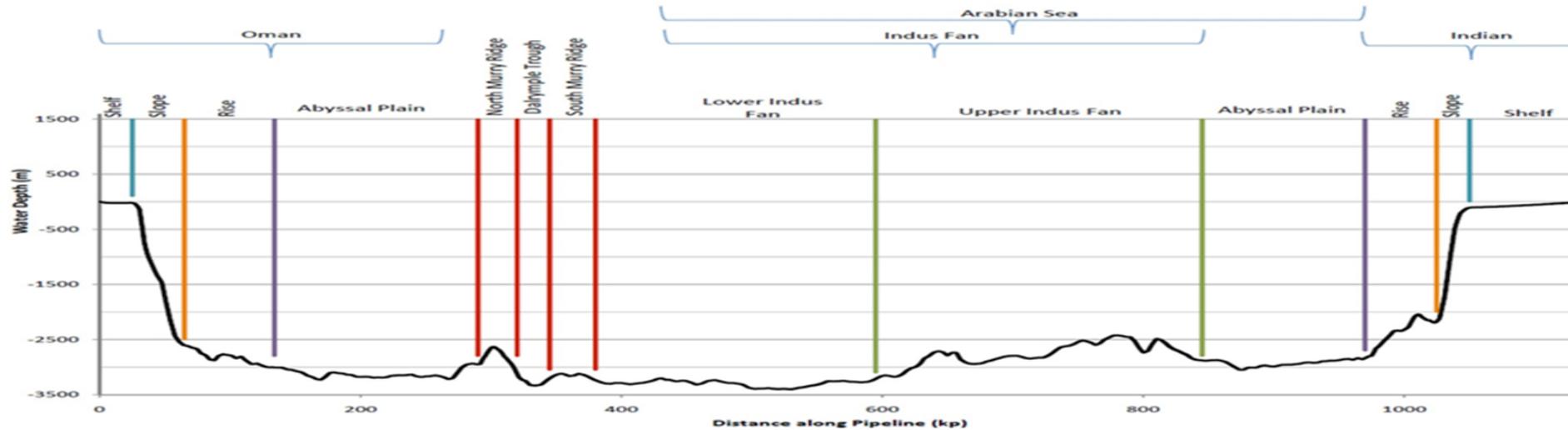
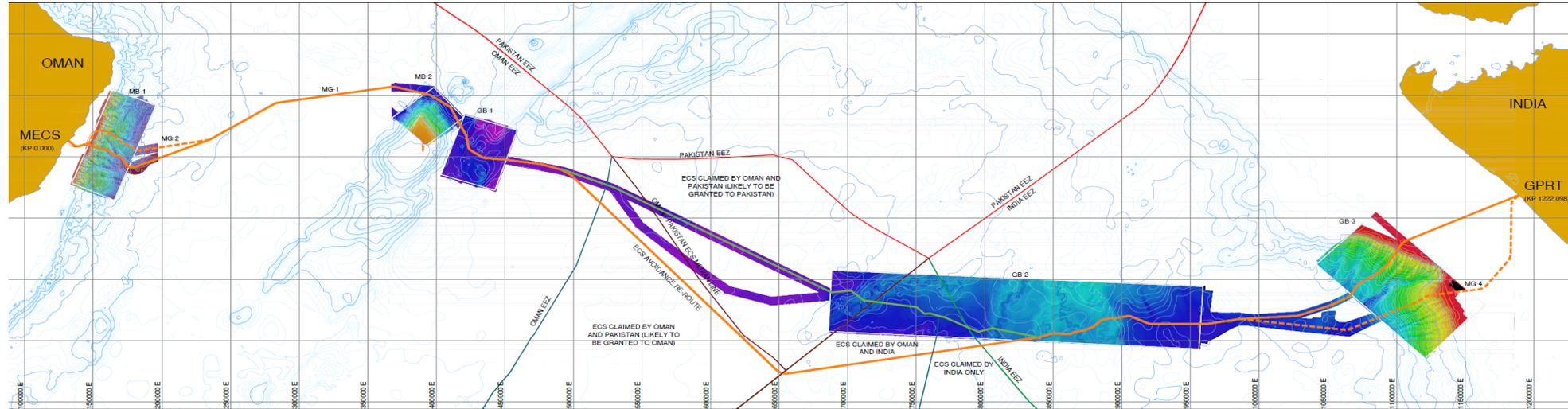
Pipe Mills	Installation Contractors	Suppliers & Off-Takers	Engineering & Consultancy
<ul style="list-style-type: none"> Liberty Steel (TATA/Corus) Welspun JindalSAW PCK (China) JFE Europipe NSSMC (Nippon Sumitomo) Bao Steel 	<ul style="list-style-type: none"> Allseas Saipem SpA 	<p>Off-takers</p> <ul style="list-style-type: none"> Indian Oil Co Ltd GAIL India Ltd GSPC OVL <p>Suppliers</p> <ul style="list-style-type: none"> Oman Ministry of Oil and Gas NIOC (NIGEC) ADNOC 	<ul style="list-style-type: none"> Peritus International Ltd. Engineers India Ltd. FUGRO GeoConsulting Ltd. SBI Caps Ernst & Young (EY) RINA SpA
	<p>Certification Bodies</p>		
	<ul style="list-style-type: none"> DNVGL 		

Technical Workshop held in 2016 with participants from,

- Peritus International
- Intecsea
- DNVGL
- Allseas
- Saipem
- SAGE
- Roland Berger

MoU with Ministry of Oil & Gas, Sultanate of Oman since 2010, now known as Ministry of Energy & Minerals

2013 RECONNAISSANCE SURVEY



MEIDP PROJECT – PROGRESS SO FAR



- **Engagement of DnV, Norway as a Technical Consultant** (Confirmation of Feasibility and Approval of TQP)
- Feasibility and Pre-FEED completed - by Peritus International Ltd
- Financial Advisory Services - by SBICAP
- Indian Gas Market Assessment - by CRISIL
- Reconnaissance Survey completed - by FUGRO
- **~USD 20 million have been invested by SAGE and its Technology Partners (in R&D)**
- Successful Pre-Qualification Trials conducted by Indian and Chinese pipe mills. European and Japanese Mill Pre-Qualification is ongoing
- Installability of MEIDP confirmed by Allseas and Saipem
- Presentations made to Govt. of India entities – Ministry of External Affairs, Ministry of Petroleum & Natural Gas, NITI Aayog, Power Ministry, Fertilizer Ministry & Global Forums.
- SAGE has MoUs with Allseas, Saipem, Welspun, Engineers India Limited, GAIL (India) Ltd, Indian Oil Corporation Ltd and Oman’s Ministry of Oil & Gas

THANK YOU



South Asia Gas Enterprise Pvt. Ltd. (SAGE)

A-6, Connaught Place,

New Delhi, India.

Pin -110001

Phone : +91-11-23324245

E-mail : sms@siddhomalgroup.com

Website: www.sage-india.com