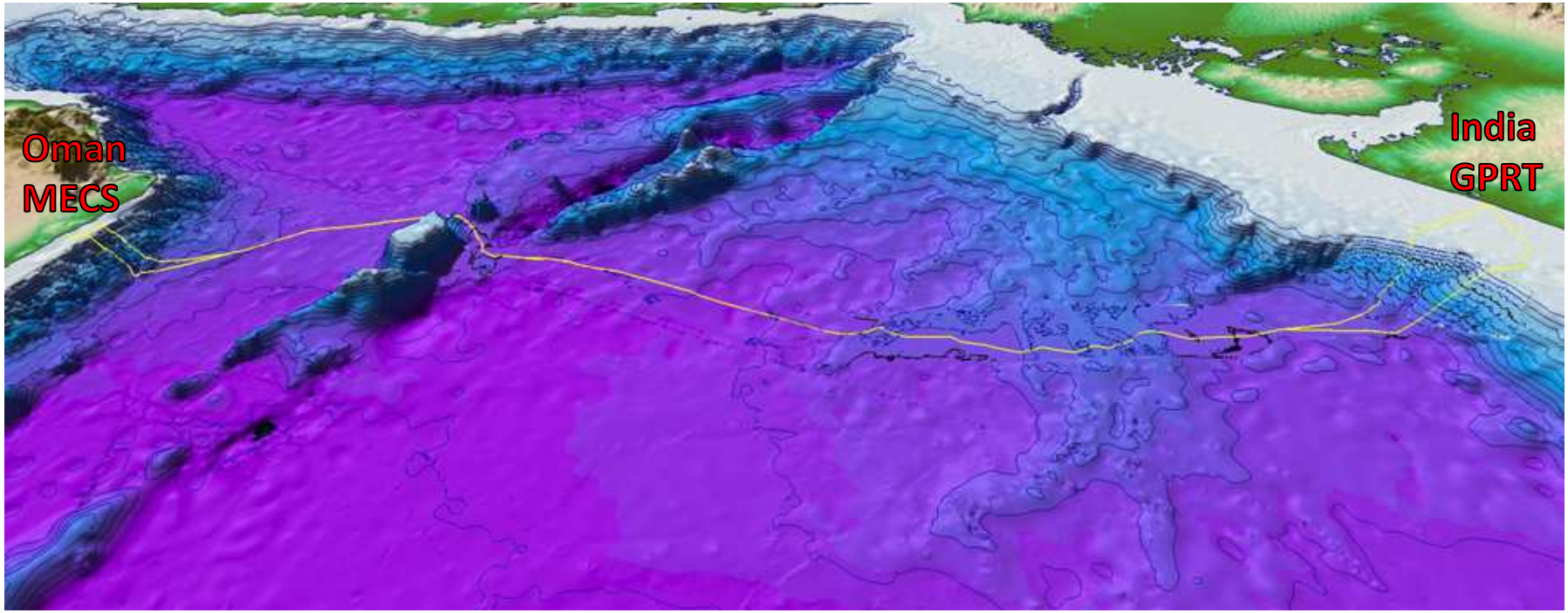
SAGE
Middle East to India
Deepwater Gas Pipeline

SIDDHO MAL GROUP

MEIDP India's Transnational Gas Pipeline



Investment Brief

15th April 2019

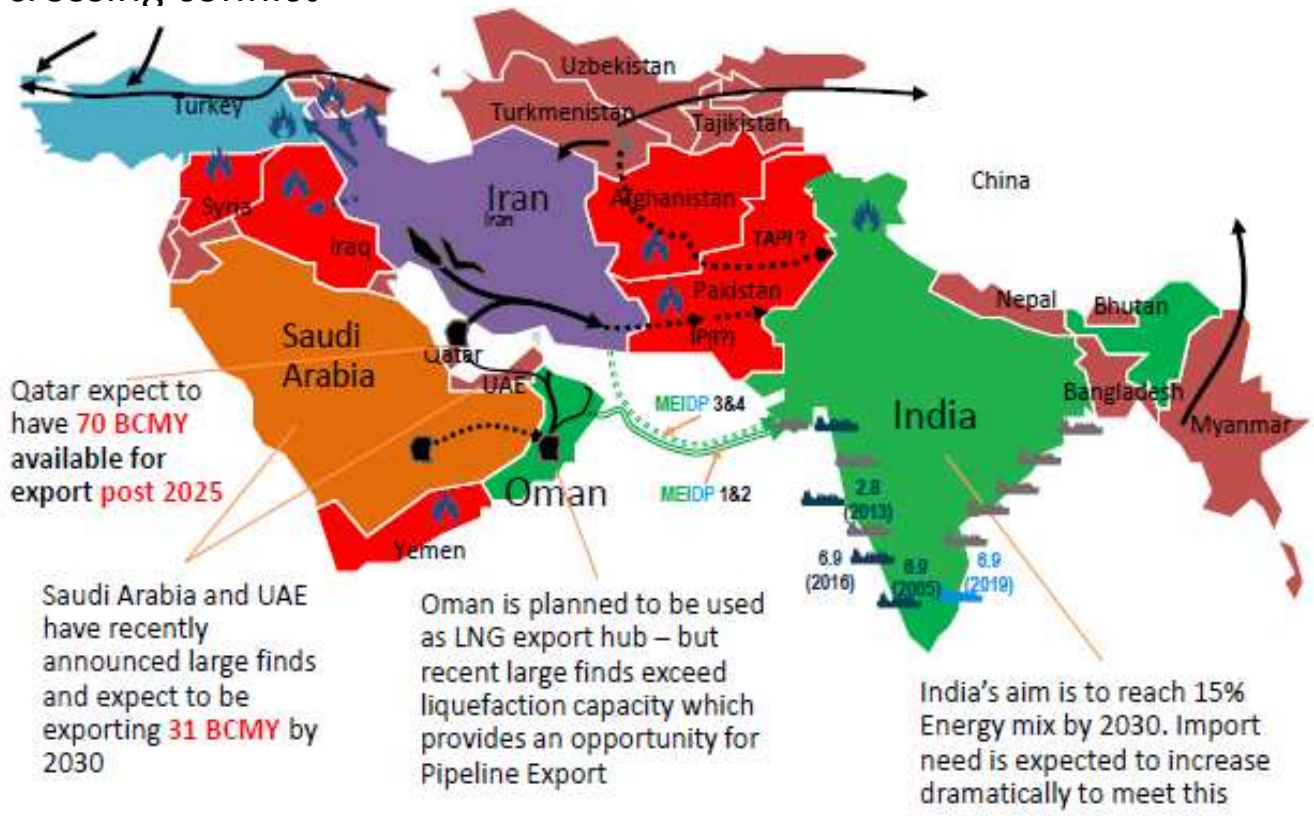
MEIDP - *SAGE Project Vision*

Project	**Middle East to India Deep-Water Gas Pipeline (MEIDP)**
Sponsor	South Asia Gas Enterprise Pvt Ltd (SAGE)
Proposal	Development of an **Energy Corridor** for transportation of gas from **Middle East to India** by the **safest, most economic & reliable means**
Proposed Route	Middle East Landfall (Oman) to Indian Landfall (Gujarat), via Arabian Sea. Alternate route from Iran (Chabahar), Subject to lifting of US Sanctions.
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 Seller** 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 for last **9 years**

MEIDP - *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 Oman 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

MEIDP 1 & 2 From Oman MEIDP 3 & 4 From Iran (Post US Sanctions)

RLNG on stream RLNG under construction Considered RLNG (uncertain)

Source: BP; IEA; IGU; Roland Berger

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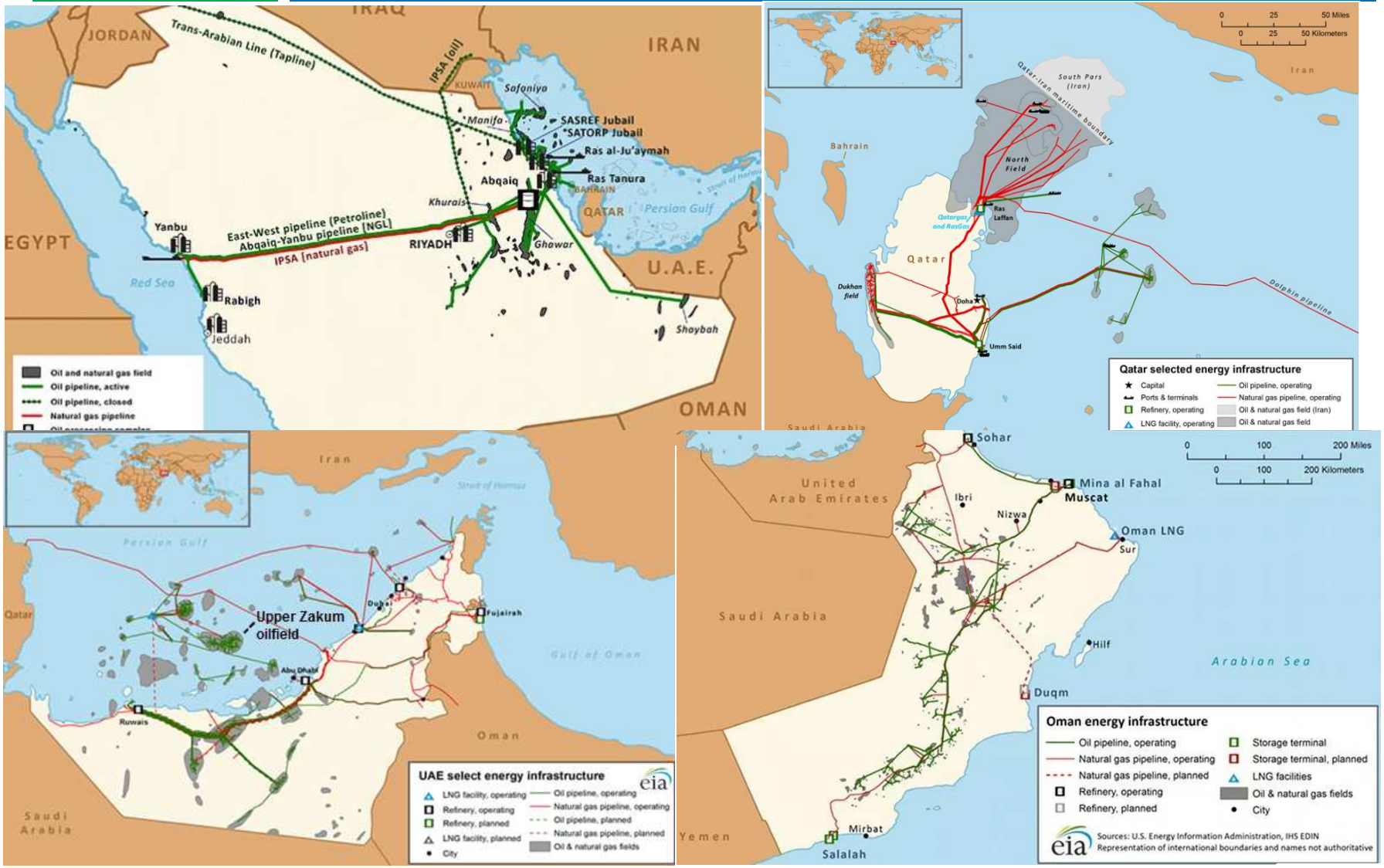
MEIDP – *Energy Infrastructure in Arabian Peninsular (Current)*



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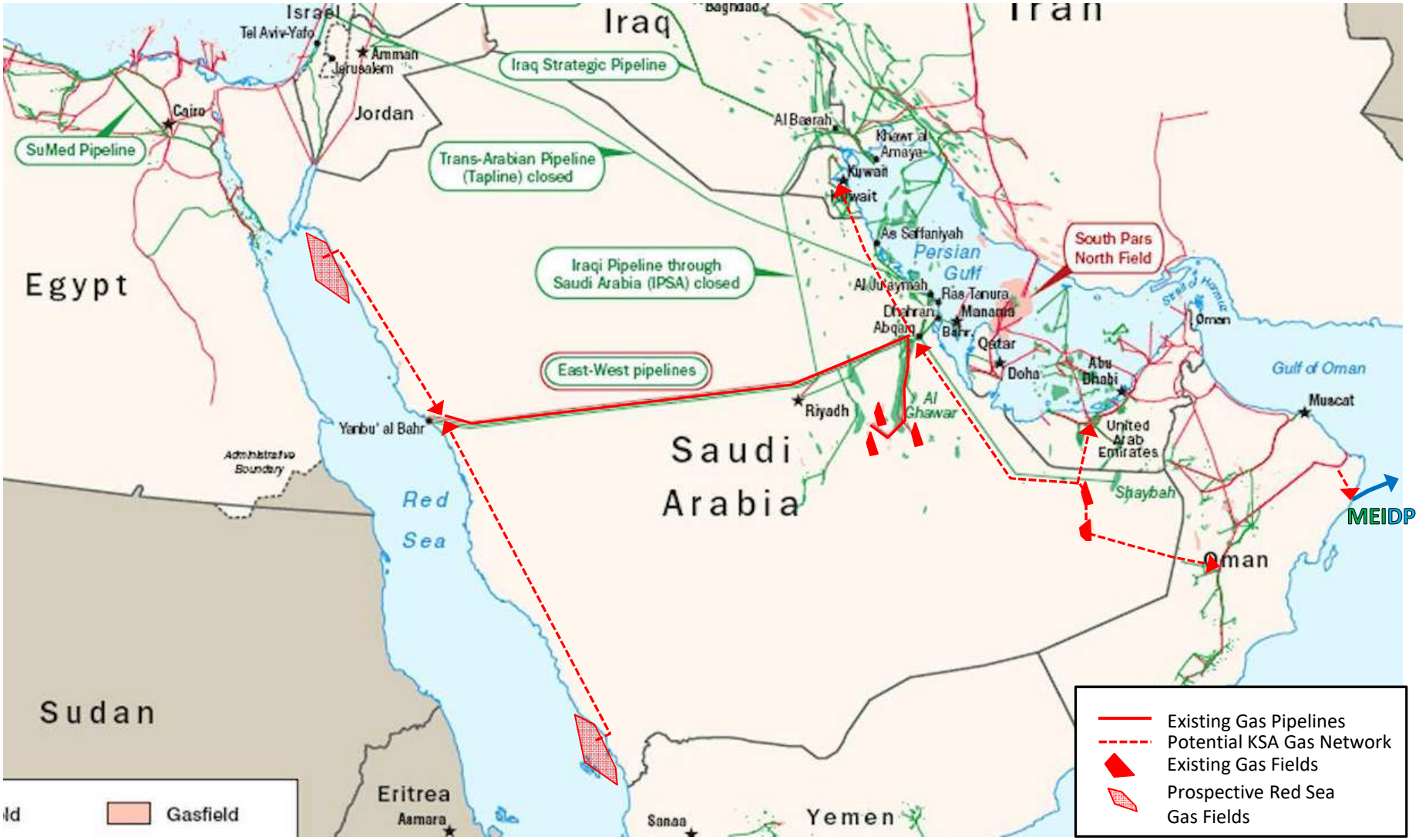
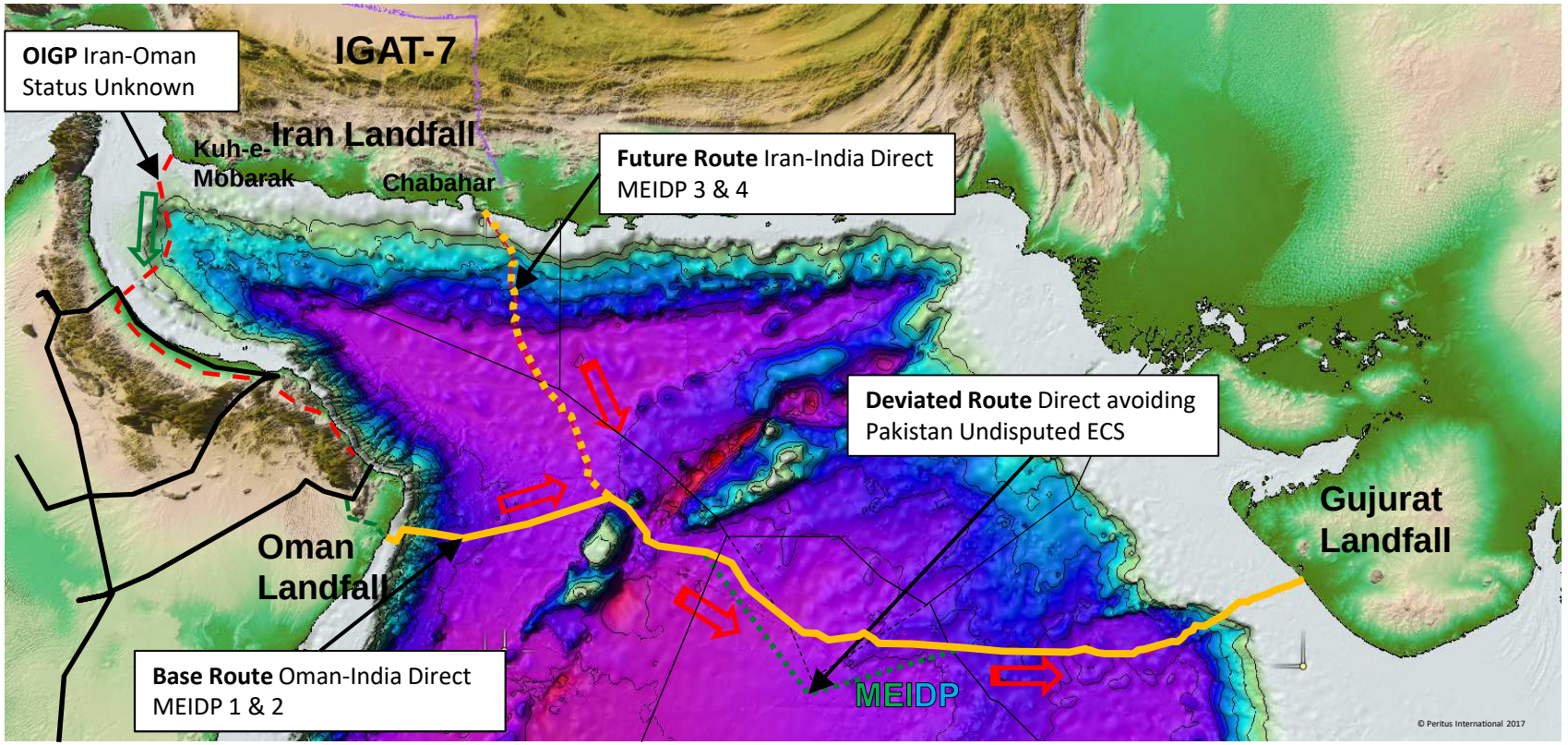
MEIDP – *Potential KSA Gas Infrastructure*



MEIDP ROUTE- *Oman to India (via Arabian sea)*

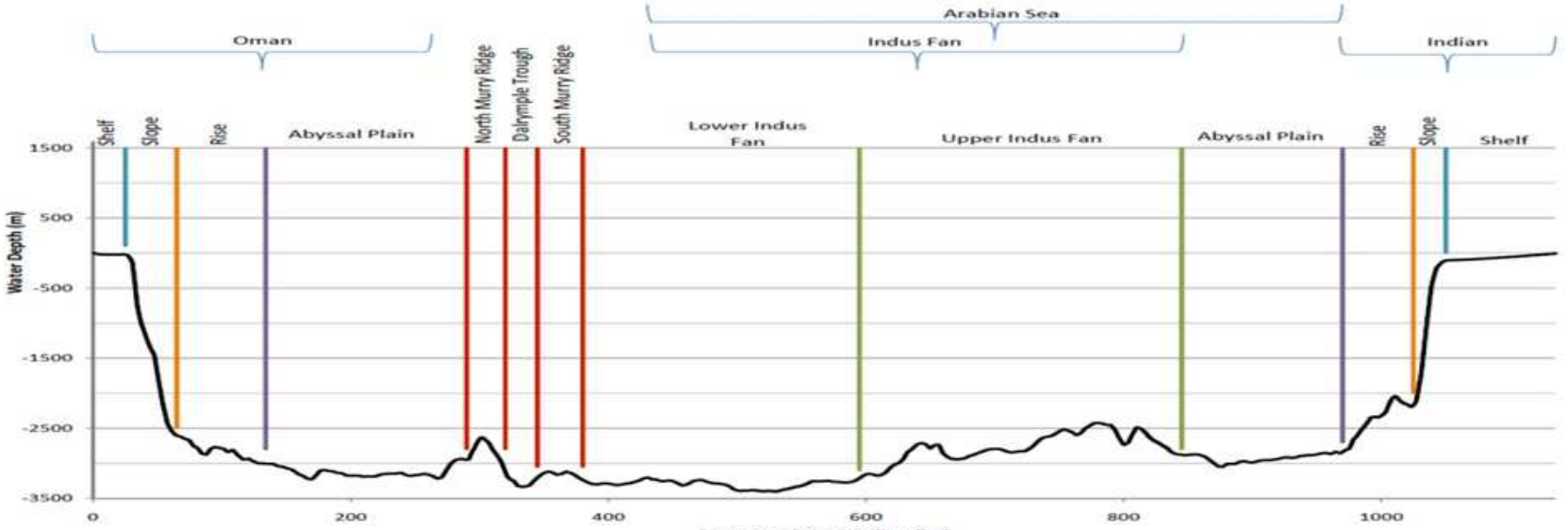


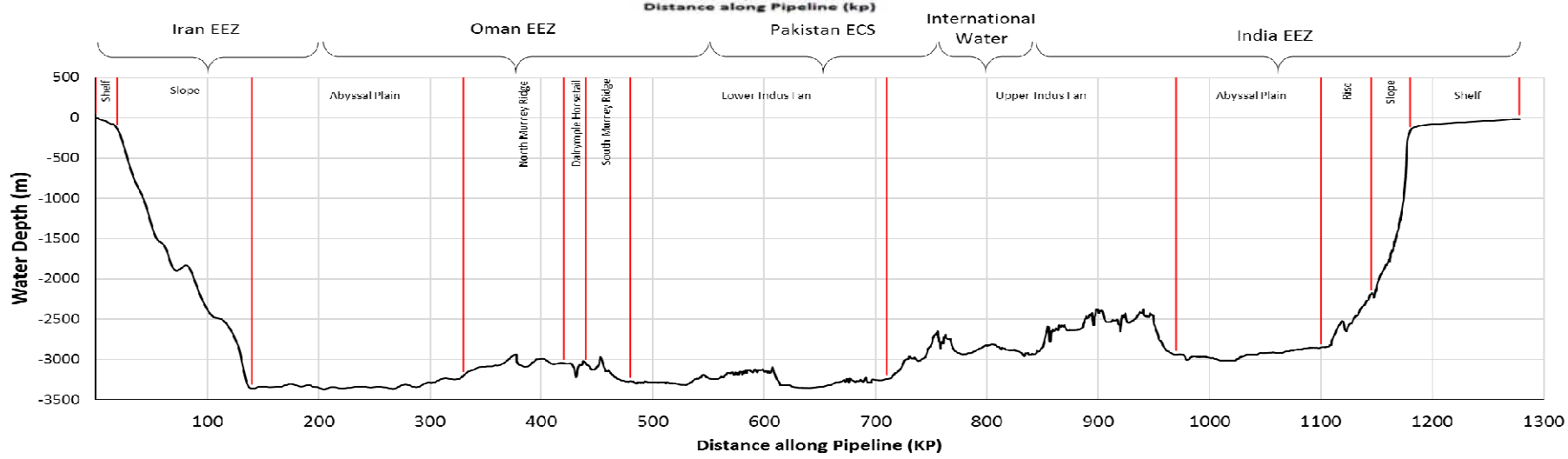
Oman-India Route Length 1200km, Max WD 3500m
Iran-India Route Length 1300km, Max WD 3500m
Deviation adds 50km, Max WD 3500m

MEIDP - *Project Summary*

- **Start Point: -** Ras al Jifan, Oman
- **End Point:** - Near Porbandar (South Gujarat), India
- **Throughput:-** 10.3BSCM/yr (Averaged Annual) 11.3BSCM/yr (Max)
- **Inlet Pressure:-** 400barg
- **Diameter:-** 24" I.D. (27.2" O.D.)
- **Wall Thickness:-** 32.9-40.5mm WT (DNVGL ST-F101)
- **Steel Grade: -** DNVGL SAWL485 FDU (X70 Equivalent)
- **Maximum Depth:** - 3,450m
- **Length:** - 1,200 km
- **Steel Tonnage:** - 800,000 tonnes (Approx)
- **Project Duration:** - 5 years (as Fast Track)
- **Pipeline Construction:** - 2 years
- **Approx Cost:** - $4.5b

MEIDP - *Middle East to India Route Profiles*





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MEIDP - *Project De-Risking*

Technical Viability and de-risking by DNVGL and Peritus International Limited (2017)

- Project Definition and preliminary technical studies were carried out in 2010-2013
- Confirmed Technical Viability 2013
- Reconnaissance survey performed in 2013 on Oman to India route. Base case route reviewed and optimised
- Review of project economics and legal project framework 2014
- Route options defined to avoid Pakistan ECS and updated flow assurance mechanical design performed 2015/2016
- Updated Cost Estimate and schedule 2016
- Technical Review Workshop Held Aug 2016 (SAGE/Peritus/EIL/DNVGL/Saipem/Allseas/Intecsea)
- Pipeline Installers reconfirmed their ability to lay the pipeline 2016
- Statement of Feasibility by DNVGL 2017
- Statement of Feasibility by EIL 2017
- Technical Qualification Plan developed by SAGE and approved by DNVGL 2018

MEIDP – *Feasibility Confirmed*

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

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).

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

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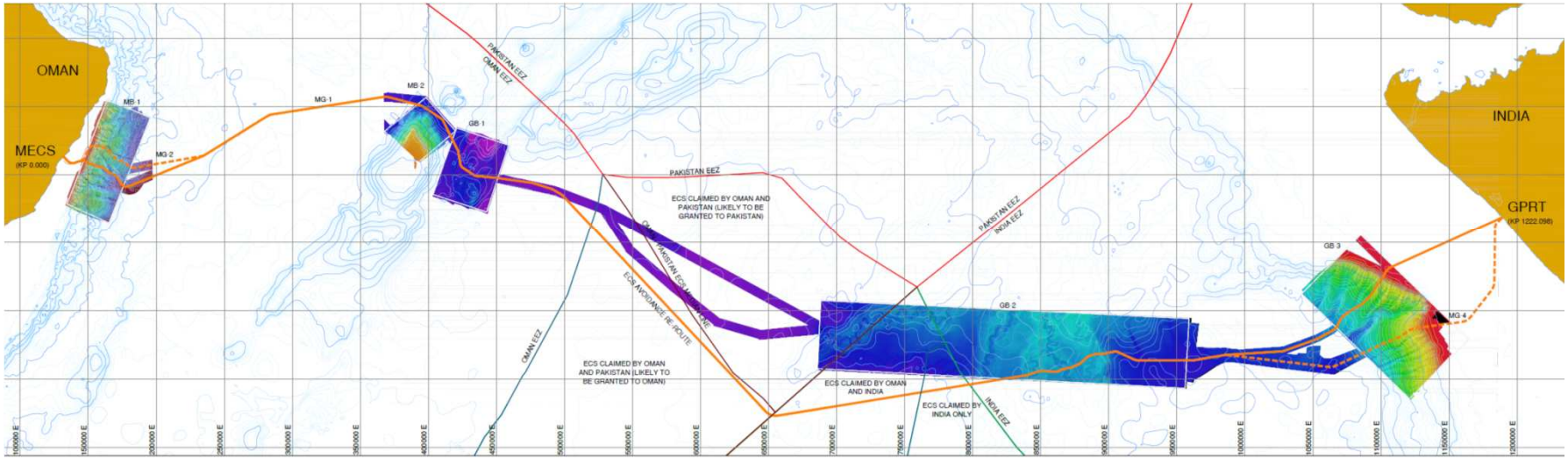
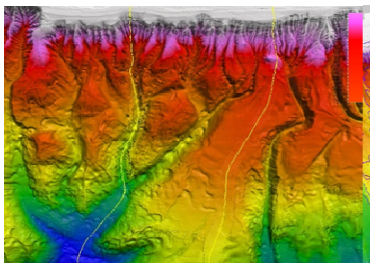
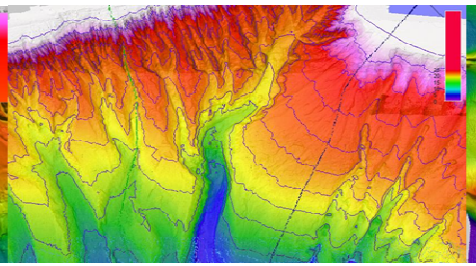
MEIDP - *2013 Reconnaissance Survey*



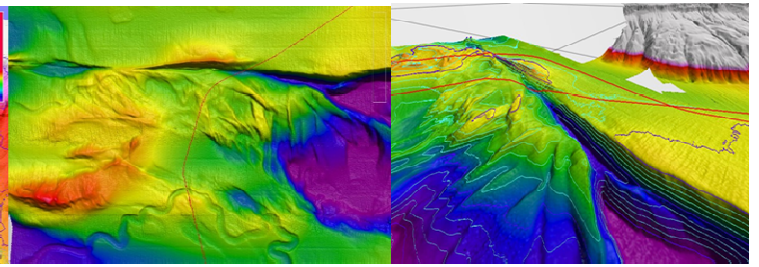
Oman Continental Slope



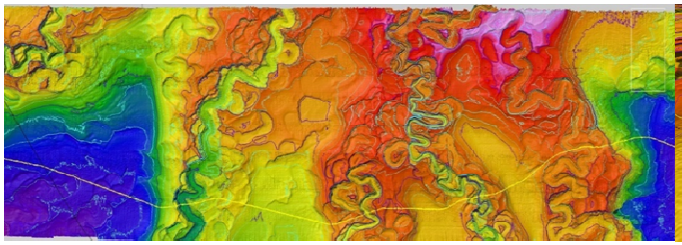
Indian Continental Slope

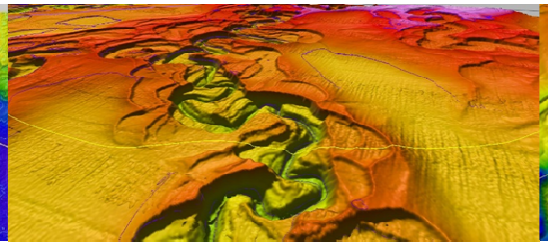


Owen Fracture Zone

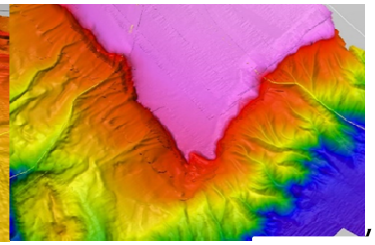


Indus Fan





Qalhat Seamount



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MEIDP – Pipeline Tariff Estimation

Levelized Pipeline Tariff* based on

- Financial / Commercial Viability & Bankability of the Project

Case 1: Levelized Tariff (USD $/MMBTU)

Particulars/Year	Oman-India
For all years	1.86

Case 2 : Fixed Tariff with escalation

Particulars/Year	Oman-India
1	1.48
2	1.52
3	1.57
4	1.61
5	1.66

Tariff Calculation by SBI Cap

**Levelized Tariff based on Project IRR of 12% (post-tax)*

Project CAPEX $4.5b, 50yr life

Route 1 (Oman-India)

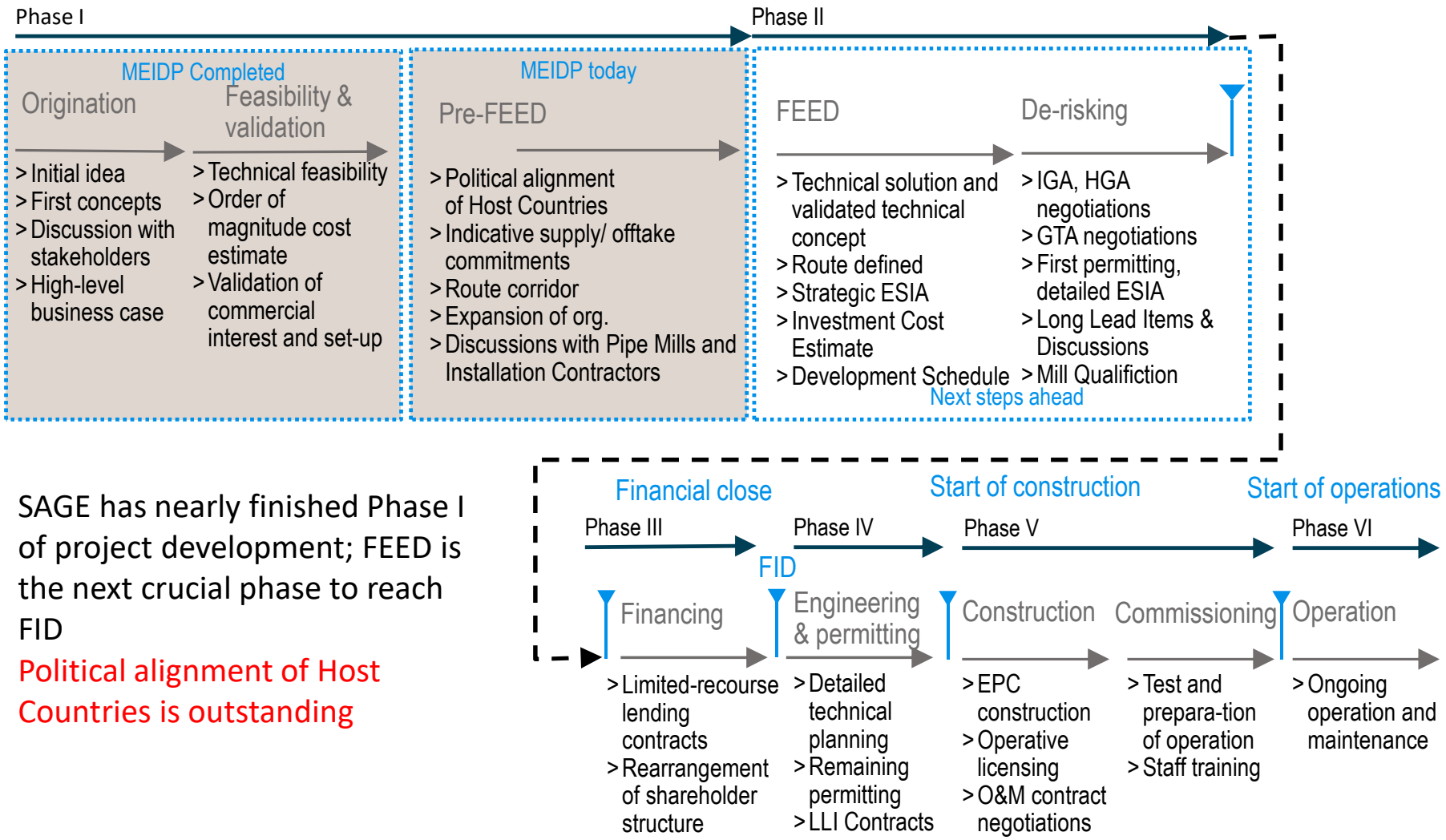
- For a gas price of USD 3.83/mmbtu at the inlet of MEIDP Pipeline, the landed price is USD **$5.69/mmbtu,** with delivered price of gas for end user in India is estimated to be **USD $7.92/mmbtu.**

Particular	Value ($)
Landfall price-Iran	**3.83**
Pipeline Tariff	1.86
Landed Cost-Indian Port	**5.69**
Custom Duty	0.30
Other Taxes & Duties	0.93
Local Transport	1.00
Delivered Cost-End User	**7.92**

Route 2 (Iran-India)

- For a gas price of USD $3.83/mmbtu at the inlet of MEIDP Pipeline, the landed price is USD **$5.78/mmbtu,** with delivered price for end user in India is estimated to be **USD $8.01/mmbtu.**
- Landed Cost of Pipeline Gas is expected to be USD **$2.00/mmbtu** cheaper than LNG.

MEIDP - The Way Ahead



SAGE has nearly finished Phase I of project development; FEED is the next crucial phase to reach FID

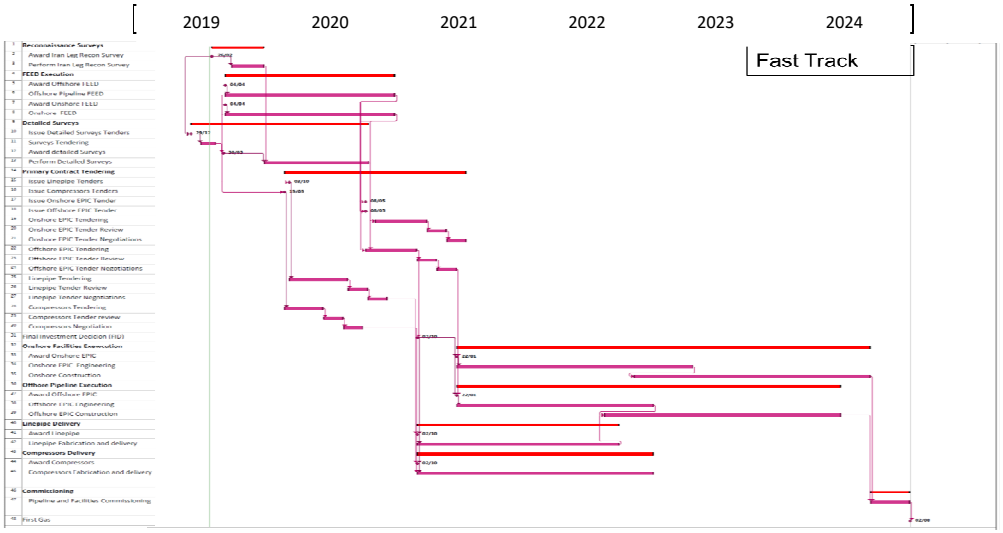
Political alignment of Host Countries is outstanding

MEIDP - Schedule (provisional timeline)

Event	Date
Award Reconnaissance and Metocean Surveys	Jun 2019
Commence Reconnaissance Survey (For Deviation)	Oct 2019
Commence Metocean Survey	Oct 2019
Award Onshore & Offshore FEED	Aug 2019
Award Detailed Surveys	Oct 2019
Final Investment Decision	Dec 2020
Award Linepipe Contract	Dec 2020
Award Onshore & Offshore EPIC	Jun 2021
Start Offshore Construction	Oct 2022
Start Compressor Station Construction	Apr 2023
Complete Offshore Construction	Apr 2025
Complete Compressor Station Construction	Jun 2025
First Gas	Dec 2025

Project can be executed in a 5 years if bought on **fast track** with **active government support** as substantial preparatory work has already been done and continues

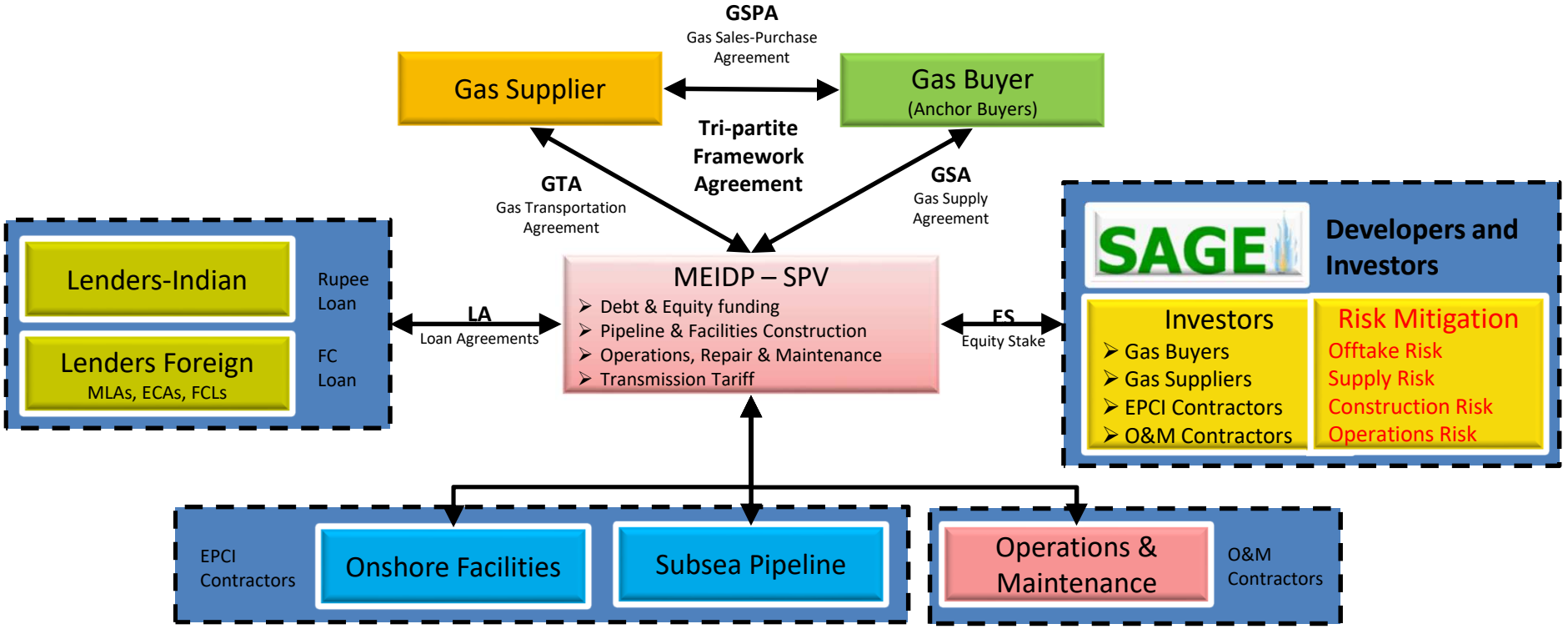
Pipeline construction will occur over a 2 year period



MEIDP - *Proposed Project Structure*

As most Transnational Gas pipelines are Gas supplier driven, Oman should consider token Equity investment in SAGE Project

This will reassure Indian Gas Buyers regarding long term Gas availability for at least 25 years, and long term commitment / support for this Project.



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

MEIDP - Conclusions

- **Technical feasibility** of the **MEIDP** Project has been **confirmed**
  - DNV GL, Norway has confirmed the Feasibility for MEIDP Project
  - Engineer India Limited (EIL) has prepared 'Pre-feasibility Report' and estimated the Project Cost
  - Feasibility and Pre FEED Studies completed- by Peritus International Ltd
- Indian gas demand and supply balance **shortfall** continues to increase from 100mmscmd in 2014 to **270 mmscmd in 2030** as per PNGRB vision 2030 study.
- To meet Government aim of **15%** Energy mix **by 2040** their will be a shortfall of **950mmscmd** which will require **at least 4** transnational **gas pipelines** and **all** the **LNG that India can get**! (i.e India's future requires **BOTH LNG and Transnational Pipelines**)
- Oman and/or Saudi Arabia (via Oman) has 31 mmscmd gas for MEIDP. Iran has also confirmed it can supply 2 Pipelines (after US Sanctions lifting).
- **MEIDP** Project will add to India's energy **security by diversification.**
- Provides an **economically competitive** method of gas supply and **promotes completion** in Indian energy markets.
- **Indian Mills** are both **capable** and keen to supply the high quality **linepipe required** for **MEIDP**. Supporting GoI **MAKE in INDIA** policy.
- The **technology** to undertake the design, manufacture the linepipe and lay deep sea pipeline is available **NOW**.
- Long Term contracts and surety of supply, will facilitate **existing** projects and **new greenfield** projects in India which utilise the gas especially **Power & Fertilizer Sectors**.
- As with all transnational gas pipelines the **MEIDP** Project needs **strong diplomatic & political** support from Omani and Indian Governments

MEIDP – Thank You

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