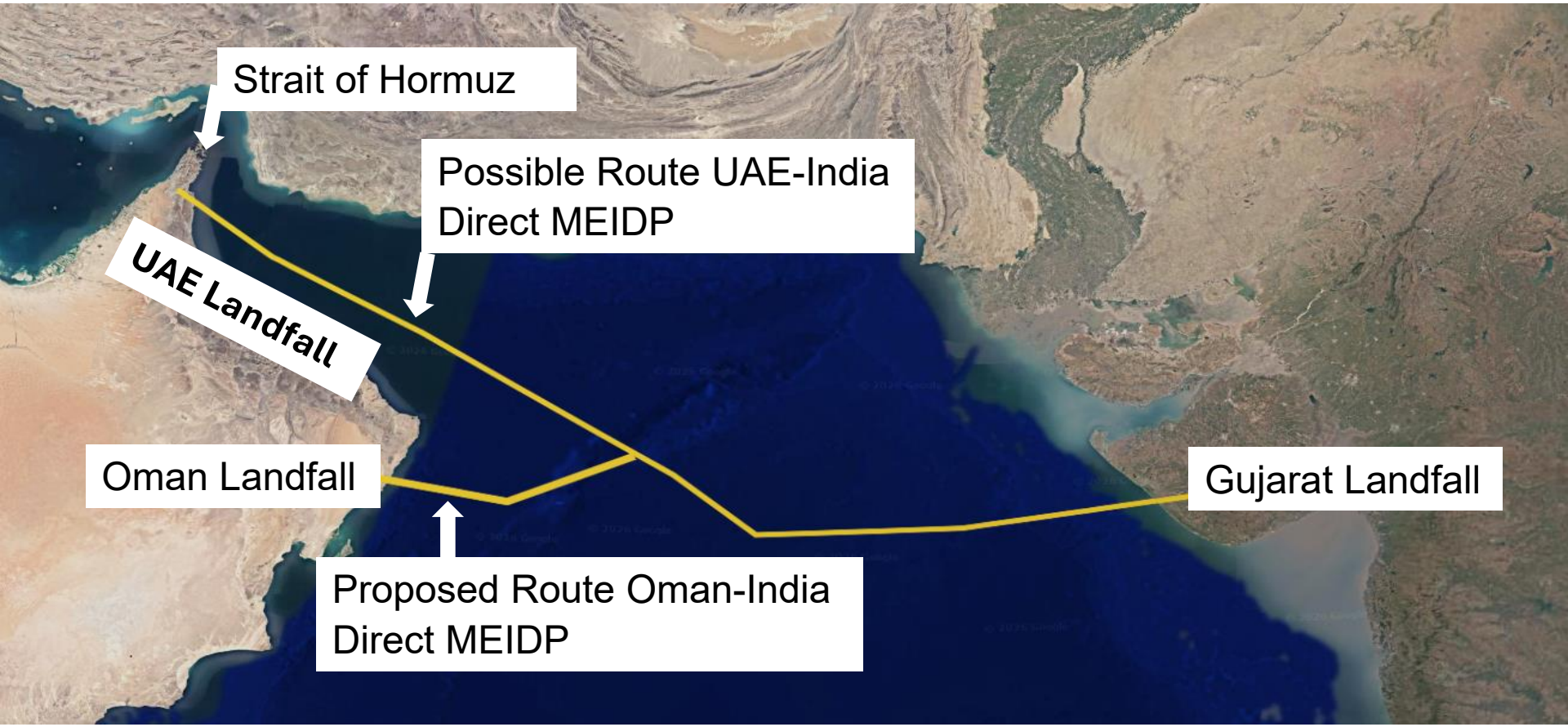
SAGE MEIDP PROJECT PRESENTATION TO MINISTRY OF POWER



PROPOSAL FOR DEVELOPMENT OF A TRANSNATIONAL GAS PIPELINE (MEIDP) TO MEET THE RISING NATIONAL ENERGY DEMAND

SAGE Middle East to India Deepwater Gas Pipeline | Peritus International, UK | SIDDHO MAL GROUP | SBICAPS Complete Investment Banking Solutions

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)

MEIDP | SAGE KEY TEAM MEMBERS & TECHNOLOGY PARTNERS

Name	Role	Name	Role
Mr Subodh Jain	- 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	- Group Manging 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	- Former Chairman & Managing Director of Engineers India Ltd (EIL) - Member of the SAGE Advisory Board	**Mr Asle Venas**	- Ex-Global Director of Pipelines DNVGL & Consultant Pipelines - Norway
Mr. D.P Srivastava	- 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	- Ex- Senior Vice President Subsea & Sealines Saipem SpA, Milan, Italy & Consultant, DNV	**Engineers India Ltd**	- Leading Onshore Pipeline and Facilities Engineering - SAGE Indian Design Consultants
Dr Ping Liu	- Managing Director, Worley Ltd.	**Ernst & Young**	- Financial Advisory Services

MEIDP | TRANS-NATIONAL GAS PIPELINES

- Govt. of India aims to increase share of Natural Gas in the Energy Mix to 15% by 2030. Majority of the demand growth is expected to be driven by 3 key sectors – Power, Fertilizer and City Gas Distribution
- Robust gas import infrastructure would be required to meet the additional gas requirement at affordable prices.
- India is expected to have R-LNG capacity of 77.7 MMTPA by FY 30 (including existing 42.70 MMTPA capacity) to cater to LNG imports, leaving a shortfall in natural gas import infrastructure for ~70-75 MMTPA.
- China get 17% of its gas needs through transnational gas pipelines from various countries.
- **Over 2,700 TCF of Natural Gas** is held by the countries with which India has trading relationships including Oman/UAE /Qatar/Saudi Arabia/Iran.

MEIDP | CONCEPT & COMPETITIVENESS

- Dolphin pipeline already transport Qatar pipeline gas to UAE/Oman and has spare capacity.
- **Gas Rich Middle East Countries** looking for **new export markets**
- India will need 150 MMTPA of additional gas to meet the target Energy mix. Domestic natural gas production is expected to be 33 MMTPA by FY 30
- **Trans-National Gas Pipeline** from nearby regions (within ~1300-1500 km) can act as an **Energy Corridor for long term affordable gas supply to India, outside the strait of Hormuz.**
- India needs gas at price of $.6-7/- per MMBTU, to increase gas demand.

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

- **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 Allseas 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.
  - Total Core Project Cost estimated for **Single ID is $6.07 Billion.**
  - “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.**
- **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.**

MEIDP | 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

MEIDP | 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” {Artic 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}

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**

Option Comparison for MEIDP between start points of Oman and Fujairah

Key Measures	Oman	Fujairah (Dual Dia)
Length (km)	1200	1595
Max Depth (m)	3500	3500
Cost ($bn)	4.9	6.5
Throughput (MMSm^3/d)	31.1	30.9
Crossings	25	51
Steel Tonnage	717,000	955,000
Offshore Seasons for Installation	1-2	2

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.

Project Cost & Means of Finance

Capex & Means of Finance **(US$ Billion)**

Particulars	Fujairah-India
Total Project Cost (in USD Billion) [1]	7.36
Debt (in USD Billion)	4.91
Equity (in USD Billion)	2.45
Debt: Equity Ratio	2:1
Debt	Foreign Currency Loan
Debt Terms	
Door-to-Door Tenor	1) 25 Years
Drawdown Period	2) 5 Years
Moratorium Period	3) 1 Year
Repayment Period	4) 19 Years

Capex Phasing

Capex Phasing [2]	First Year	Second Year	Third Year	Fourth Year	Fifth Year
Fujairah - India	10%	20%	35%	25%	10%

[1][2]Source: Peritus

Cost Competitiveness

- **Fixed Gas Tariff/ Levelized Tariff Methodology-** Standard methodology to calculate tariff
- **Levelized Tariff for MEIDP Pipeline** comes out to **USD 2.37/ MMBTU,** based on target Equity IRR of **12%** and D:E Ratio of **2:1 (67%:33%)**

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

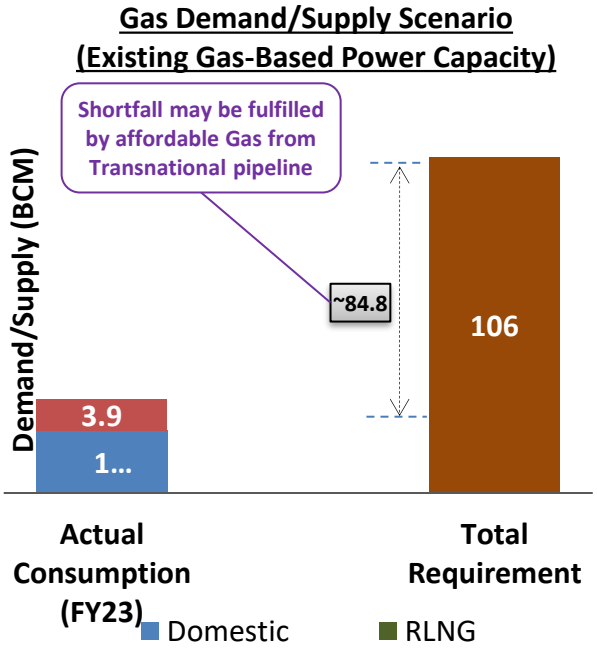
Sector-wise Affordability of Natural Gas – Power Sector

➢ **Gas Based Power Plants**

- ❑ Off-take constraints from DISCOMs a major issue for lower LNG consumption
- ❑ Gas based plants operated on significantly low PLF levels (~13-14% in FY23)
- ❑ Currently, non-competitive prices of R-LNG is affecting PLFs of Gas based power plants
- ❑ Only ~17.3 mmscmd of Domestic Gas was available to Power sector in FY23

➢ **Availability of affordable Transnational Gas** can help increasing the utilization of Gas-based Power Plants

- ❑ MEIDP Pipeline tariff of USD 2.37 /MMBtu more affordable as compared to liquefaction, transportation and regasification costs of LNG of USD 4.5-5.0 /MMBtu



Source: CRISIL, Central Electric Authority (CEA) and Ministry of Power, GoI

Potential Gas requirement for existing Gas based capacity is ~106 mmscmd, while actual gas consumption is only ~21.2 mmscmd in FY23

Source: Crisil, Ministry of Power (Govt of India), Central Electric Authority (Govt of India)

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

Sector-wise Affordability of Natural Gas – Fertilizer Sector

Fertilizer Sector is supported through Govt. subsidy

- During FY23, Fertilizer units consumed **~54 mmscmd** of natural gas in India. (Domestic Gas ~12.5 mmscmd (~23%) and RLNG ~41.8 mmscmd (~77%)
- New and existing fertilizer units to **increase gas demand to ~60-62 mmscmd by FY29**
- Availability of **affordable Transnational Gas** has potential to reduce Government Subsidy outgo
  - Reduction of cost by **US$1/mmbtu reduces Urea production cost by ~US$20/MT**
  - Considering **50% of MEIDP capacity** (15.55 mmscmd) is utilized for Urea production,
    - Potential savings in **Subsidy outgo of ~Rs 3,725 Cr/year*,** considering gas through MEIDP is cheaper by US$ 2/mmbtu vis-à-vis RLNG

1 USD= 93.4 INR

Availability of affordable Gas can substantially reduce Subsidy burden on exchequer

Source: PPAC, MoPNG, Crisil *Note: 1 MMTPA= 3.60 mmscmd; 1 BCM = 2.74 mmscmd; 1 mmscmd= 12.9 BCF*

Sector-wise Affordability of Natural Gas – Fertilizer Sector

Particulars		
Total MEIDP Capacity	*(A)*	31.1 mmscmd
Proportion of MEIDP capacity utilised for Fertiliser Sector	*(B) = 50% of (A)*	**15.55 mmscmd**
Natural Gas required per MMT Urea production	*(C)*	1.56 mmscmd
Estimated Urea production per year using MEIDP Gas	*(D) = (B)/ (C)*	**9.97 MMT**
Diff. in MEIDP Delivered Gas Price vis-à-vis RLNG	*(E)*	US$ 2/mmbtu
Savings in Subsidy outgo per US$1/mmbtu reduction in Gas Price	*(F)*	US$ 20/MT
Potential Savings in Subsidy outgo per year		**~US$ 400 Mn**
	(G) = [(D)(E)*(F)*93.4]/10*	**~Rs 3,725 Cr**

Source: PPAC, MoPNG, Crisil *Note: 1 MMTPA= 3.60 mmscmd; 1 BCM = 2.74 mmscmd; 1 mmscmd= 12.9 BCF* *1 USD= 93.4 INR*

Sector-wise Affordability of Natural Gas – City Gas Distribution

- CGD has become the **fastest growing sector in India** in recent years
- Gas demand in CGD Sector is expected to grow at **~15-20% CAGR from ~33.6 mmscmd in FY23 to ~90-95 mmscmd in FY29**
- **Absence of incremental Domestic Gas** leading to increased dependence on imported Gas.
- LNG price beyond USD $10-12/mmbtu is not sustainable
- Expansion of CGD network and growing awareness for cleaner fuel to aid in fuel conversion in industrial segment and boost demand for affordable gas.
- **Availability of affordable Gas through Transnational Pipeline** has potential to increase the gas consumption and improve the viability for the development of CGD sector

Source: Crisil

MEIDP – Potential National Savings

➢ Potential National Savings

Particulars		
Total MEIDP Capacity	*(A)*	31.1 MMSCMD
Savings in MEIDP Delivered Gas	*(B)*	**2$/MMBTU**
Potential National Savings per annum	***(C) = [(A)*365]*(B)***	**~$900 Mn**

➢ NPV

IRR	Economic Life	$ Mn	Rs. Cr
12%	25 years	~7,060	~65,940
	35 years	~7,360	~68,742
	40 years	~7,420	~69,303
10%	25 years	~8,170	~76,308
	35 years	~8,680	~81,071
	40 years	~8,800	~82,192

1USD = 93.4INR

Availability of cheaper gas through MEIDP will lead to growth in sectors such as Power, Fertilizers, City Gas Distribution, etc. thereby contributing towards socio-economic development of the country

Key Assumptions

Pipeline Capacity

Particulars	Fujairah-India
Pipeline Capacity (Max in MMSCMD)	30.40

Capacity Utilization

Capacity Utilization	First Year	Second Year	Third Year Onwards
Fujairah - India	80%	90%	100%

Operating Expenses

Particulars (Fujairah – India)	Percentage	Escalation
O&M Expenses (as % of Gross Block)	1.00%	3% p.a.
Insurance (as % of Net Block)	1.00%	3% p.a.
Other Expenses including wheeling (as % of O&M Expenses)	20.00%	3% p.a.
Regular Capex (USD Million)	USD 6.50 Million per year	

Source: Peritus

Fixed Gas Tariff/ Levelized Tariff Calculation & Scenarios

A) Tariff Scenario – with different Target Equity IRR

Equity IRR	Tariff (USD/MMBtu)	Project IRR %
10%	2.21	6.58%
12% (Base Case)	**2.37**	**7.30%**
14%	2.53	8.03%

- **Tariff remains in narrow range from USD 2.21-2.53 /MMBtu, for a range of Equity IRR from 10-14%**

B) Tariff Scenario – with different D:E Ratio at Equity IRR of 12%

Debt:Equity Ratio	Project Cost (in USD Billion)	Tariff (USD/MMBtu)
2:1 D:E Ratio (Base Case)	**7.36**	**2.37**
50:50 D:E Ratio	7.12	2.66
60:40 D:E Ratio	7.26	2.48
70:30 D:E Ratio	7.41	2.31

Fixed Gas Tariff/ Levelized Tariff Calculation & Scenarios

C) Tariff Scenario – with different Capacity Utilization

Capacity Utilization		Tariff (USD/MMBtu)
Y1 - 80%, Y2 - 90%, Y3 onwards - 100%		**2.37**
Y1 - 80%, Y2 - 90%, Y3 onwards - 90%		2.59
Y1 - 70%, Y2 - 80%, Y3 onwards - 80%		2.91

D) Tariff Scenario – Equity IRR and Project IRR

Tariff ($/MMBTU)	Equity IRR	Project IRR
2.37	**12.00%**	**7.10%**
3.00	18.90%	9.90%
3.50	23.17%	11.67%
4.00	26.66%	13.26%
4.25	28.20%	14.00%

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.**
- 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 at affordable price.
  - **Landed cost of RLNG is presently affordable by only few sectors and not by the Fertilizer & Power sectors. Gas subsidy for Urea exceeds Rs.50,000/- crores annually,** due to high LNG prices in global markets.
- India, thus requires a **robust gas import infrastructure, including multiple supply channels (Avoiding the Strait of Hormuz)** to meet its increasing gas demand at affordable prices.
- Availability of transnational pipeline gas helps to moderate the impact of volatile LNG prices. Non-availability of Russian pipeline gas has almost doubled gas prices in Europe since the Ukraine crisis. **During the recent Israel-Iran war, spot prices of LNG in the international market went up by 15-20%.**
- At least 3 transnational gas pipelines are needed in next 10/12 years to bring 100 MMSCMD gas from the Gulf countries to the Gujarat coast, at affordable price of $ 6 - 7/- per mmbtu.
- 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).
- In future even pipeline gas from Russia may also be possible through this route/gas swap.
- **MEA may consider taking a lead role for this transnational gas pipeline considering the geo-political reasons.**

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

- Power Ministry may order preparations of a Draft Feasibility Report (DFR) for evaluation of the MEIDP by EIL within 3 months.
- 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.
- There is intense competition globally for accessing gas Resources in Gulf Regions from international Oil Cos., who prefer to supply more expensive LNG to India and avoid gas to gas competition, as has been seen in China/Europe.

MEIDP | PROJECT PROGRESS SO FAR

WE ARE PRESENTLY IN THE PRE-FEED STAGE

- **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 partnered - by SBICAP.
- Indian Gas Market Assessment completed - by CRISIL.
- Reconnaissance Survey completed - by FUGRO.
- **~$20 Million has been invested in R&D by SAGE and its Technology Partners.**
- Successful Pre-Qualification Trials conducted by Indian and Chinese pipe mills. European and Japanese Mill Pre-Qualification is currently ongoing.
- Installation feasibility 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.

Working Agreements with Key Stakeholders

Pipe Mills	Installation Contractors	Suppliers & Off-Takers	Engineering & Consultation
• Liberty Steel (TATA/Corus) • Welspun • Jindal SAW • PCK (China) • JFE • Europipe • NSSMC (Nippon Sumitomo) • Bao Steel	• Allseas • Saipem SpA **Certified Bodies** • DNVGL	**Off-takers** • Indian Oil Co Ltd • GAIL India Ltd • GSPC • OVL **Suppliers** • Oman Ministry of Oil and Gas • NIOC (NIGEC) • ADNOC	• Peritus International Ltd. • Engineers India Ltd. • FUGRO GeoConsulting Ltd. • SBI Caps • Ernst & Young (EY) • RINA SpA

Technical Workshop held in 2016 with participants from

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

We have a MoU since 2010 with the Ministry of Oil & Gas (now known as Ministry of Energy & Minerals), Sultanate of Oman.

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

Working with Leading Global Technical Consultants & Contractors

Technical Consultancy:
- Peritus International
- Engineers India Ltd
- Petrofac
- Intecsea
- Fugro Geoconsulting
- RINA SpA

Pipe Mills:
- Welspun
- Jindal SAW
- PCL
- Europipe
- JFE
- NSSMC
- Liberty Steel (TATA)

Certification Bodies
- DNGVL

Installation Contractors
- Allseas BV
- Saipem SpA

Financial Consultancy
- SBICap

Identifying technology challenges & risks

Installation & Intervention Gap Analysis:
- Peritus International (2011)

Quantified Risk Assessment:
- Peritus International (2011

Geohazard definition and Fault Crossing Assessment:
- Fugro (2012)
- D'Appolonia (2012)

Metocean Parameter Definition
- Fugro (2011/2012)

GIS Data Collection
- Fugro (2012)
- D'Appolonia (2012)

Emergency Pipeline Repair:
- Pertitus International (2011)

Vessel Capabilities & Equipment Review:
- Peritus International (2011 & 2015)
- Roland Berger (2016)

Financial Model:
- SBICap (2017)
- SBICap Fujairah Option (2023)

Route Survey and Evaluation

Reconnaissance Survey Definition & SOW:
- Peritus International (2012 & 2015)

Reconnaissance Survey:
- Fugro OSAE (2013)

Landfall Point Identification:
- EIL 2014

Route Optimisation:
- Peritus International (2015)

Indus Fan Crossing assessment:
- Peritus International (2015)

Owen Fracture Zone Crossing Assessment:
- Peritus International (2015)

UAE Route Definition:
- Peritus International (2022)

Developing Engineering Solutions

Design Basis definition:
- Peritus International (2010)

Flow Assurance Studies:
- Peritus International (2010, 2016 & 2022)

Mechanical Design:
- Peritus International (2010 & 2016)
- Peritus International Fujairah Option (2022)

Onshore Compression:
- Intecsea WorleyParsons (2011)
- Petrofac (2012)

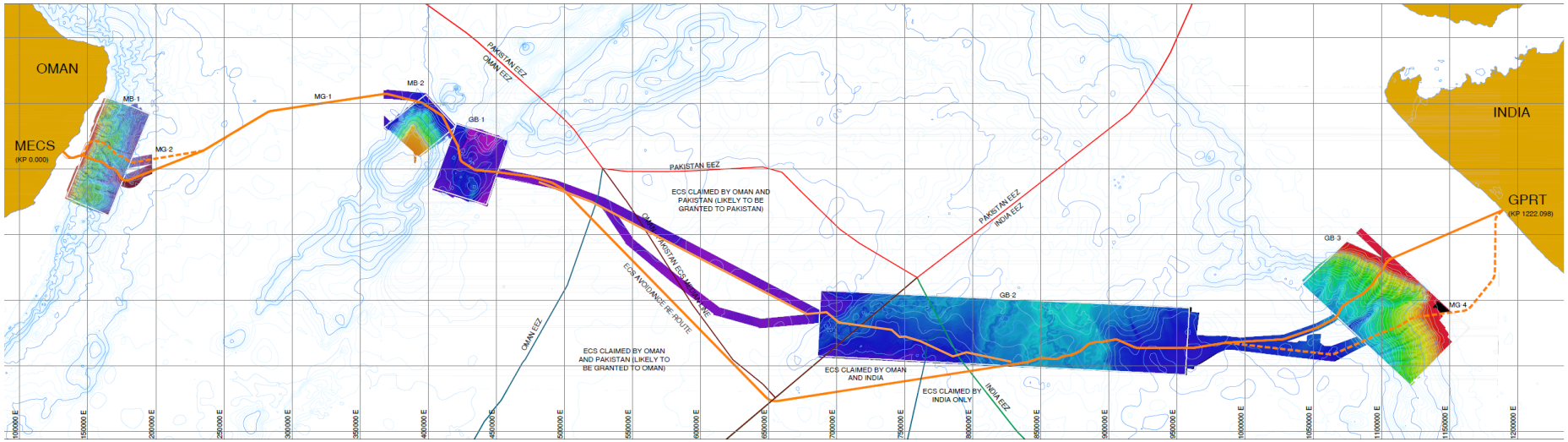
Receiving Terminal:
- Petrofac (2012)

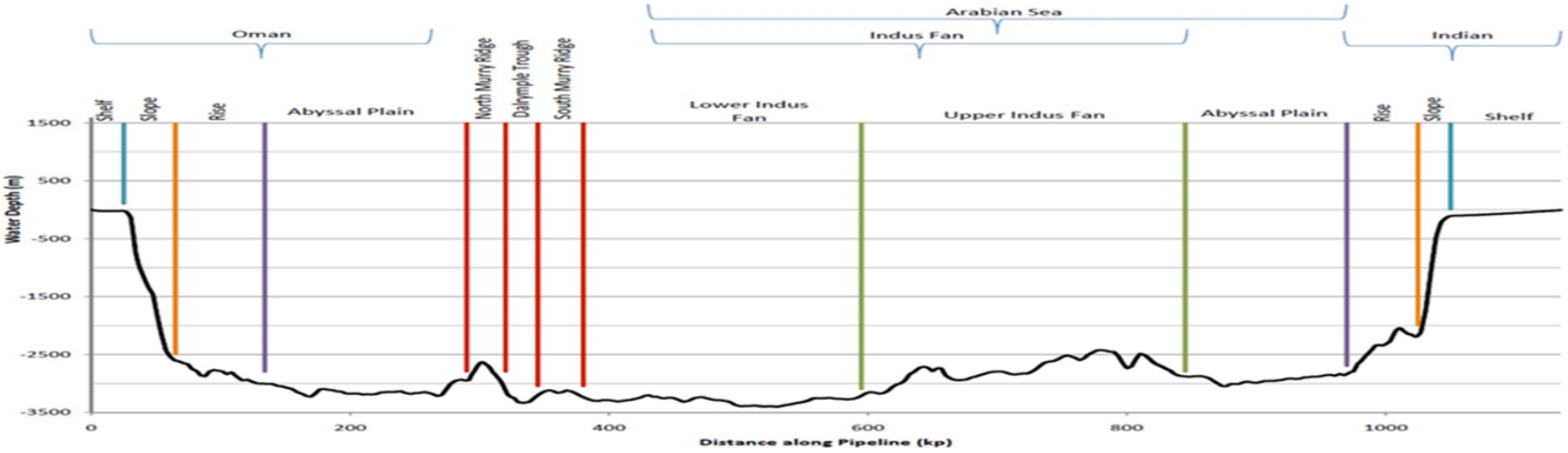
Technical QualificationPlan:
- Peritus International and DNVGL (2018)

Installation Assessments:
- Allseas (2015)
- Saipem(2015)

Cost Estimate:
- Peritus International/ Petrofac/Worley(2012)
- Peritus International (2017)
- Peritus International Fujairah Option (2022)

MEIDP | 2013 Reconnaissance Survey





MEIDP | ESTABLISHED TECHNICAL FEASIBILITY

Peritus International, UK | SAGE Middle East to India Deepwater Gas Pipeline | SIDDHO MAL GROUP

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 | ESTABLISHED TECHNICAL FEASIBILITY

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

Capable Pipe Mills

ATMANIRBHAR BHARAT

In line with the vision and values of our Hon'ble Prime Minister Shri Narendra Modiji, Indian suppliers can make a substantial part of 800,000 MT of Pipe with an estimated value of $1 Billion, furthering OUR commitment towards MAKE IN INDIA .

- ✓ Two pipe mills (Jindal SAW & PCK) have manufactured pipeline specifically for SAGE to MEIDP Dimensions and Specifications (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.

MEIDP | PROJECT FEASIBILITY STATEMENTS

Feasibility Confirmed / Qualification Plan Endorsed

इंजीनियर्स इंडिया लिमिटेड ENGINEERS INDIA LIMITED
(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)

पंजीकृत कार्यालय : इंजीनियर्स इंडिया भवन, 1, भीकाजी 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

SAGE
Middle East to India
Deepwater Gas Pipeline

SIDDHO MAL GROUP

Peritus International, UK

SBICAPS
Complete Investment Banking Solutions

THANK YOU

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New Delhi- 110001, India.
Phone : +91-11-23324245, E-mail : sms@siddhomalgroup.com Website: www.sage-india.com

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, Germany	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

Approximate Daily Energy Flow to India through The Strait of Hormuz

The **Strait of Hormuz** is the main maritime gateway for oil and gas exports from the Persian Gulf to Asia. India is one of the largest importers using this route.

Daily Energy Transport to India

Energy Type	Volume reaching India through Hormuz	Notes
Crude Oil	~2.0 – 2.7 million barrels/day	Around 40–50% of India's crude imports come through this route
LNG (Liquefied Natural Gas)	~60 million cubic meters/day (≈17–18 million tonnes/year)	About 60–69% of India's LNG imports, mainly from Qatar.
LPG & Gas liquids	~80–85% of India's LPG imports	Almost all LPG from Gulf suppliers passes through Hormuz

In Simple Terms (Per Day)

- **Oil:** ~2–2.7 million barrels/day
- **LNG gas:** ~60 million m^3/day
- **LPG:** majority of India's LPG imports

India consumes about **5–5.5 million barrels of oil daily**, so **nearly half of the oil India uses depends on this single sea route.**

Energy shipments that pass through Hormuz and reach India mainly originate from **Saudi Arabia, Iraq, UAE, Kuwait & Qatar (major LNG supplier)**

MEIDP | Power Sector in India

IBEF

ATTRACTIVE OPPORTUNITIES

- ❖ According to a report by Motilal Oswal, the Indian power sector presents an investment opportunity worth Rs. 40,00,000 crore (US$ 461.95 billion) over the next decade, driven by rising demand, infrastructure upgrades, and the transition to clean energy.
- ❖ Renewable energy and transmission infrastructure offer attractive prospects, such as Power Grid's Rs. 2,00,000 crore (US$ 23.10 billion) Capital Expenditure (capex) opportunity.
- ❖ India's wind energy sector is making significant strides towards achieving the ambitious target of 100 GW of production by 2030, according to the Indian Wind Turbine Manufacturers Association (IWTMA).
- ❖ India's Nuclear Energy Mission sets a target of achieving 100 GW of nuclear power capacity by 2047.
- ❖ **Transnational pipeline is cheaper/cost effective alternative to RLNG as transporting gas through pipelines doesn't involve liquefaction/re-gasification.**
- ❖ **MEIDP Pipeline tariff of USD. 2.37 /MMBtu more affordable as compared to liquefaction, transportation and regasification costs of LNG of USD 4.44 – 7.15 /MMBtu.**
- ❖ **Transnational Pipelines for transportation of gas from gas rich countries to India, can be a viable option for Power Sector.**

GROWING DEMAND

- ✓ India is the third-largest producer and consumer of electricity worldwide, with an installed power capacity of 505 GW as of October 2025.
- ✓ Growing population along with increasing electrification and per-capita usage will provide further impetus. Power consumption in India in FY23 logged a 9.5% growth to 1,503.65 Billion Units (BU).
- ✓ The all-India peak power demand in FY26 is expected to be 277 GW. In FY25, India consumed 1,694 billion units of electricity, an increase of 33% over FY21, translating into a 5-year CAGR of 7.4%.
- ✓ India's energy demand is expected to grow in the range of 6–6.5% over the next five years, ratings agency ICRA.
- ✓ India added a record 20.1 GW of renewable energy capacity in April-August FY26, a 123% increase YoY.

MEIDP | Growth in Installed Capacity

Category	Installed Capacity (MW) As on 31.03.25	% Share in Total Installed Capacity	Installed Capacity (MW) As on 31.12.25	% Share in Total Installed Capacity	Increase (MW)	% Increase
Fossil Fuel Capacity						
Coal	215193	45.28	219610	42.75	4417	2.05
Lignite	6620	1.39	6620	1.29	0	0
Gas	24533	5.16	20122	3.92	-4411	-17.98
Diesel	589	0.12	589	0.11	0	0
Total Fossil Fuel Capacity	246935	51.95	246941	48.07	6	0.002