Presentation to HE Dr. Amir Hossein Zamaninia
Hon. Dy. Minister for Trade and International Affairs
Ministry of Petroleum, Iran

Tehran - 6th May 2017
**The MEIDP Project**

The MEIDP Project is envisaged as transmission pipeline **infrastructure project** allowing transportation of Middle East Gas to the West Coast of India.

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.

The Gas Buyers and the Gas seller will negotiate the **Long Term Gas Supply Contract** themselves [under the aegis of SAGE in a Tri-partite Framework Agreement].

MEIDP 1 will be the **first in a series** of pipelines supplying gas to the Gujarat coast of India, from the vast available resources in the Middle east, by the **safest, most economic and reliable** means.

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**Iran - India’s Gas Partner**

**India needs gas**

- Over 2,000 TCF of natural gas reserves are held by countries with which India has a traditional **trading relationship** i.e. Iran, Qatar and Turkmenistan.
- Iran has over 1000 TCF reserves and is **eager to export gas**.
- The **deepwater route** across the Arabian Sea is the **shortest secure distance** between huge middle east reserves and the rapidly developing industrial heartland of India, and is **too short for LNG to be an economic transportation option**

**Iran has gas**

- Iran has always been a friendly neighbour to India
- Iran has expressed its willingness to supply Natural Gas and a Framework Agreement has been discussed with NIGEC [Now NIOC Gas Export Division] for Pipeline Construction and Gas Supply through the SAGE Pipeline
- In 2015 NIGEC confirmed to SAGE that they are currently in a position to provide gas for **2 pipelines** from Iran to India
<table>
<thead>
<tr>
<th>Name</th>
<th>Role and Experience</th>
<th>Role and Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr T.N.R Rao</td>
<td>Former Petroleum Secretary, Govt of India Architect of Oman-India Pipeline Chairman of SAGE Advisory Board</td>
<td>Member of the SAGE Advisory Board and Senior Consultant to SAGE</td>
</tr>
<tr>
<td>Mr Subodh Jain</td>
<td>Director South Asia Gas Enterprise PVT Ltd. Director Siddho Mal &amp; Sons and Director INOX Air Products Ltd. Former Senior Advisor to Oman-India Pipeline</td>
<td>Leading International Expert on Marine Pipeline Engineering Professor Emeritus, University of Surrey UK &amp; Visiting Professor, University College London</td>
</tr>
<tr>
<td>Mr Peter Roberts</td>
<td>Former Director South Asia Gas Enterprise PVT Ltd. Director Verderg Ltd. Former Project Director of Oman-India Pipeline</td>
<td>Senior Vice President Saipem SpA, Milan, Italy</td>
</tr>
<tr>
<td>Dr Herman Franssen</td>
<td>Member of the SAGE Advisory Board and Senior Consultant to SAGE President, International Energy Associates, USA Former Advisor to Oman-India Pipeline &amp; Former Economic Advisor to the Sultanate of Oman, MoP</td>
<td>Dr Alastair Walker</td>
</tr>
<tr>
<td>Dr Ping Liu</td>
<td>Operations Director, Intecsea BV, Netherlands</td>
<td>Dr Roberto Bruschi</td>
</tr>
<tr>
<td>Mr Marco Monopoli</td>
<td>Offshore Commercial Manager Saipem SpA, Milan, Italy</td>
<td>Mr Johan Drost</td>
</tr>
<tr>
<td>Mr Johan Drost</td>
<td>Allseas International, Delft, Netherlands</td>
<td>SBI Capital Markets Ltd</td>
</tr>
<tr>
<td>Mr Ian Nash</td>
<td>Managing Director, Peritus International (UK) Ltd. 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 and EM for Canyon Express Ultra Deep development</td>
<td>Ernst &amp; Young Financial Advisory Services</td>
</tr>
<tr>
<td></td>
<td>SBI Capital Markets Ltd</td>
<td>SAGE Indian Design Consultants</td>
</tr>
<tr>
<td></td>
<td>Ernst &amp; Young</td>
<td>Leading Onshore Pipeline and Facilities Engineering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SAGE Middle East to India Deepwater Gas Pipeline</td>
</tr>
</tbody>
</table>
Governments must be stakeholders (through their agencies) for Transnational Pipelines.

All interest parties must be stakeholders for Large Infrastructure Projects.
Working in Partnership

MOUs and Agreements to Co-operate in developing MEIDP have been signed with:

<table>
<thead>
<tr>
<th>Pipe Mills</th>
<th>Installation Contractors</th>
<th>Suppliers &amp; Takers</th>
<th>Engineering &amp; Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Welspun (India)</td>
<td>▪ Allseas</td>
<td>▪ NIGEC</td>
<td>▪ Peritus International Ltd. (uk)</td>
</tr>
<tr>
<td>▪ Jindal SAW (India)</td>
<td>▪ Saipem SpA</td>
<td>▪ Indian Oil Corp.</td>
<td>▪ Engineers India Ltd.</td>
</tr>
<tr>
<td>▪ Tata Corus (UK)</td>
<td>▪ Heerema Marine Contractors</td>
<td>▪ GAIL</td>
<td>▪ Intecsea</td>
</tr>
<tr>
<td>▪ PCK (China)</td>
<td></td>
<td>▪ GSPC</td>
<td>▪ FUGRO</td>
</tr>
<tr>
<td>▪ JFE (Japan)</td>
<td></td>
<td>▪ Oman Ministry of Oil &amp; Gas</td>
<td>▪ SBI Caps</td>
</tr>
<tr>
<td>▪ Europipe (Germany)</td>
<td></td>
<td></td>
<td>▪ Ernst &amp; Young (EY)</td>
</tr>
<tr>
<td>▪ NSSMC (Nippon Sumitomo) (Japan)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Bao Steel (China)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ DNV-GL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particulars</td>
<td>Pipeline</td>
<td>LNG</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Constant Supply</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Gas Source</td>
<td>Fixed source and destination for gas</td>
<td>Flexibility to source gas from various sources</td>
<td></td>
</tr>
<tr>
<td>Long Term Commitment</td>
<td>Yes</td>
<td>Possible to source Long Term and Spot Cargoes</td>
<td></td>
</tr>
<tr>
<td>Cost of Construction</td>
<td>Dependent on distance, capacity and depth</td>
<td>Dependent only on capacity – relatively independent of distance</td>
<td></td>
</tr>
<tr>
<td>Operating Cost</td>
<td>Only transportation tariff applies</td>
<td>Transportation tariff, Liquefaction charges, Regas charges</td>
<td></td>
</tr>
<tr>
<td>Maintenance Cost</td>
<td>Minimal</td>
<td>Periodic maintenance required</td>
<td></td>
</tr>
</tbody>
</table>
COMPETITIVENESS OF PIPELINES

Economic Limit of Pipeline Gas to India West Coast is ~2000km

<table>
<thead>
<tr>
<th></th>
<th>Dry Gas Price</th>
<th>Liquefaction Cost</th>
<th>Shipping Tariff</th>
<th>Regasification</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG</td>
<td>3-4</td>
<td>~4.0</td>
<td>0.3</td>
<td>0.5</td>
<td>7.8-8.8</td>
</tr>
<tr>
<td>Pipeline</td>
<td>3-4</td>
<td>-</td>
<td>2.5</td>
<td>-</td>
<td>5.5-6.5</td>
</tr>
<tr>
<td>Difference in landed gas price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3</td>
</tr>
</tbody>
</table>
To cover the increasing gas demand, India plans to expand its import infrastructure with new RLNG plants and pipelines.

- 4 existing LNG regasification plants
- 12 planned/considered LNG regasification plants
- up to 4 pipelines

Pipelines help to moderate Gas prices.
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.
WIN FOR IRAN

- Provides Iran with a Safe and Secure long term means of Gas monetization. (Unlike other considered pipeline options such as IPI).

- Gives Iran access to a large and growing gas market on its doorstep. With potential for up to 4 Pipelines along the corridor based on India’s projected gas shortage.

- Provides Iran with the opportunity for higher net back gas price than LNG given that LNG in Iran will be greenfield development.

- Facilitates upstream Investment in Iran by Indian companies in Discovered Gas field near SAGE pipeline to allow easy evacuation of Gas to India (OVL Farzad B).

- Builds on existing intergovernmental agreements on trade and development.
Even as a developing country it can be argued that India is becoming too heavily dependent on costly LNG. SAGE pipeline Gas from Iran can generate Power at prices similar to Clean Coal. Potentially each SAGE Gas pipeline of 31.1 mmcmd saves India almost a billion dollars annually when compared to Spot / Term LNG imports / price.

- Pipeline/LNG competition moderates Gas prices to the consumer
- 50% of India Gas demand is from the Power & Fertilizer industry, who can only use Gas at affordable prices ($5 to $6 per mmbtu) and hence cannot afford LNG, unless subsidized.
- Currently 15,000 MW of Gas based Power generation capacity is stranded due to High long term LNG Gas prices
- Five new Fertilizer Plants are planned in India (India is also considering overseas Fertilizer plants).
- Much investment is taking place in India internal Gas pipelines (and LNG Terminals) but currently there is no Gas in India’s main “Arteries”
<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Start Point</td>
<td>Chabahar (Iran)</td>
</tr>
<tr>
<td>End Point</td>
<td>Near Porbandar (Gujarat), India</td>
</tr>
<tr>
<td>Outside Diameter</td>
<td>27.2”</td>
</tr>
<tr>
<td>Design Pressure</td>
<td>400 bar (g)</td>
</tr>
<tr>
<td>Design Temperature</td>
<td>60°C (max.) &amp; -10°C (min)</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>1.0 BSCFD (31.1 MMSCMD)</td>
</tr>
<tr>
<td>Maximum Depth</td>
<td>3,450 meters</td>
</tr>
<tr>
<td>Offshore length</td>
<td>1,300 kilometers</td>
</tr>
<tr>
<td>Total Project Duration</td>
<td>5 year (including 2 years construction)</td>
</tr>
<tr>
<td>Project cost (approx.)</td>
<td>5 billion USD</td>
</tr>
</tbody>
</table>
## Indicative Project Cost - Capex Breakdown

- **“As Built” Project Cost (Indicative): ~USD 5 Bn**
- **Project Cost Break up**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Offshore Segment (USD Mn)</th>
<th>Iran Onshore Segment (USD Mn)</th>
<th>India Onshore Segment (USD Mn)</th>
<th>CCS (USD Mn)</th>
<th>GPRT (USD Mn)</th>
<th>Total (USD Mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Procurement</td>
<td>960.6</td>
<td>2.2</td>
<td>1.3</td>
<td>202.6</td>
<td>100.0</td>
<td>1,266.6</td>
</tr>
<tr>
<td>Construction</td>
<td>1,708.2</td>
<td>7.1</td>
<td>5.6</td>
<td>196.7</td>
<td>118.2</td>
<td>2,035.9</td>
</tr>
<tr>
<td>Pre-Commissioning&amp; Commissioning</td>
<td>89.8</td>
<td></td>
<td></td>
<td>8.1</td>
<td>5.3</td>
<td>103.1</td>
</tr>
<tr>
<td>Engineering &amp; Project Management</td>
<td>120.2</td>
<td>7.8</td>
<td>7.8</td>
<td>50.6</td>
<td>40.0</td>
<td>226.4</td>
</tr>
<tr>
<td>Insurance and Certification</td>
<td>69.0</td>
<td>0.1</td>
<td>0.1</td>
<td>10.2</td>
<td>5.6</td>
<td>85.0</td>
</tr>
<tr>
<td>Contingency</td>
<td>863.6</td>
<td>5.1</td>
<td>4.4</td>
<td>196.9</td>
<td>113.3</td>
<td>1,183.4</td>
</tr>
<tr>
<td><strong>Total Hard Cost</strong></td>
<td>3,811.3</td>
<td>22.4</td>
<td>19.1</td>
<td>665.0</td>
<td>382.3</td>
<td>4,900.3</td>
</tr>
<tr>
<td>Contingency Dewatering</td>
<td>57.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.2</td>
</tr>
<tr>
<td><strong>Total Project Cost</strong></td>
<td>3,868.5</td>
<td>22.4</td>
<td>19.1</td>
<td>665.0</td>
<td>382.3</td>
<td>4,957.4</td>
</tr>
</tbody>
</table>

*Chabahar Compression Station  #Gujarat Port Receiving Terminal*
MEIDP RECONNAISSANCE SURVEY ROUTE

Proposed 2017/ early 2018

Completed 2013

Iranian Slope

Oman Slope

Qalhat Seamount

Owen Fracture Zone

Indus Fan

Indian Slope
2013 MS Highlights

Oman Continental Slope  Indian Continental Slope  Owen Fracture Zone

Indus Fan  Qalhat Seamount
MEIDP ROUTE TO INDIA
Mechanical design of Pipeline

- Wall thickness required for deepest section is 40.3mm with 610mm ID line pipe.
- Buckle arrestors upto 70mm wall thickness may be required.
## Building on Previous Experience

<table>
<thead>
<tr>
<th>ISSUES</th>
<th>Oman-India</th>
<th>MEIDP</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability Of Pipe Mills</td>
<td>Upgrade in Capability required</td>
<td>Capability exists for the required size and thickness.</td>
<td>Welspun; Jindal SAW; Tata(CORUS) steel, JFE, PCK and Europipe are capable vendors</td>
</tr>
<tr>
<td>Lay Vessel</td>
<td>No Ultra Deep water vessel capability</td>
<td>Ultra Deep water vessels with adequate capability are available.</td>
<td>Pioneering Spirit, Casterone, Aegir and S7000 are already available in the field. JSD 6000 is still being considered.</td>
</tr>
<tr>
<td>Deep water repair system</td>
<td>No qualified deepwater pipeline repair system was available</td>
<td>Deepwater pipeline repair systems are now available and accessed by Repair “Clubs”</td>
<td>Diverless Subsea pipeline repair System have been developed for Deep water application by Saipem. Saipem currently has work class ROV rated to 4000m depth.</td>
</tr>
</tbody>
</table>
Seven pipe mills have responded to budget queries about the production of MEIDP line pipe, out of these three have stated they can produce the full range.

Two pipe mills (JINDAL SAW & PCK) have manufactured line pipe in presence of SAGE team specifically for SAGE to MEIDP dimensions and specification. They have gone through SAGE test program involving collapse test and compression test.

JFE & Europipe are about to embark on a similar production and testing trial.

PCK (China) have undergone “Ring Collapse” test Program, witness by SAGE.
Mills capable of making MEIDP Linepipe

- Welspun (India) - JCOE.
- Jindal SAW (India) - JCOE.
- Tata Corus (UK) - UOE
- PCK (China) – JCOE
- Europipe (Germany) – UOE
- JFE (Japan) – JUOE
- Bao Steel (China) – UOE (UNDER REVIEW)
Vessel Status & Installability

- The requirements to install MEIDP along the Route options has been assessed.
- Contact has been made with vessel owners to get confirmation of MEIDP installability. (Allseas, HMC, Saipem).
- Allseas, HMC and Saipem have all confirmed there vessels can install the pipeline.

<table>
<thead>
<tr>
<th>Company</th>
<th>Pipelay Vessel</th>
<th>Tension Capacity (tonnes)</th>
<th>J-Lay Mode</th>
<th>S-Lay Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allseas</td>
<td>Pioneering Spirit</td>
<td>n/a</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solitaire</td>
<td></td>
<td>1050</td>
<td></td>
</tr>
<tr>
<td>Saipem</td>
<td>S 7000</td>
<td>750 with tensioners</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000 with friction clamps</td>
<td>2500</td>
<td></td>
<td>750 tonnes upgradeable to 1050</td>
</tr>
<tr>
<td></td>
<td>Castorone</td>
<td>2500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heerema Marine Contractors</td>
<td>Aegir</td>
<td>1500 static</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2000 dynamic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Balder</td>
<td>1210 static</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1270 dynamic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MEIDP CAPABLE PIPELAY VESSEL

Operational

CastorONE (Saipem)

Operational

Aegir (HMC)

Operational

Pioneering Spirit (Allseas)

Operational

S7000 (Saipem)
Five vessels are capable of installing the MEIDP empty pipeline in the maximum water depth.

- SAIPEM’s S7000.
- SAIPEM’s Casterone.
- HMC’s Balder.
- HMC’s Aegir.
- Allseas Pioneering Spirit
Compressor stations

- The project will have two compressor stations, one at Chabahar (Iran) and other at Porbandar (Gujarat, India).
- SAGE is in discussion with following two compressor manufacturers:
  1) Nova Pignoni (Italy)
  2) Siemens (Germany)
HIGHLIGHTED TECHNICAL CHALLENGES

Todays Challenges

- Ultra Deep Water 3450m
- Wall Thickness on limit of Mill Capacity
- Mill Qualification
- Active Fault crossing (Seismic Design)
- Indus Fan channel crossings up to 200m deep and 30 degree slopes
- High pressure 400barg system
- Anti Flooding system required for Installation
- Hydrotest dispensation required
- Steep Slopes and geohazards on shelf breaks in Iran and India (Seismic Design)

SAGE has performed detailed assessments to ensure that these challenges can all be met by design methods and equipment/vessel now available in the Offshore Pipeline industry.
Project proposed structure

As most Transnational Gas pipelines are Gas supplier driven, Iran / NIOC should consider token Equity investment in SAGE Project.

Gas Supplier

Gas Buyer (Anchor Buyers)

GSPA
Gas Sales-Purchase Agreement

Tri-partite Framework Agreement

GTA
Gas Transportation Agreement

GSA
Gas Supply Agreement

MEIDP – SPV
- Debt & Equity funding
- Pipeline & Facilities Construction
- Operations, Repair & Maintenance
- Transmission Tariff

SAGE
Developers and Investors

Lenders-Indian
- Rupee Loan

Lenders Foreign
- MLAs, ECAs, FCLs
- FC Loan

EPCIs
- Contractors

Onshore Facilities

Subsea Pipeline

Operations & Maintenance

Risk Mitigation
- Offtake Risk
- Supply Risk
- Construction Risk
- Operations Risk

Investors
- Gas Buyers
- Gas Suppliers
- EPCI Contractors
- O&M Contractors

Equity Stake LA

Onshore 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.
Project progress De-risking

Working with leading global technical consultants & contractors
- Peritus International, EIL, Petrofac, Intecsea, Fugro Geoconsulting, D'Appolonia SpA
- Pipe Mills:
  - Welspun, JindalSAW, PCK, Europipe, JFE, NASSMC, British Steel (TATA)
Certification Bodies:
- DNV-GL
Installation Contractors:
- Alseas BV
- Heerema Marine Contractors
- Saipem SpA

Identifying technology challenges & Risks
- Installation and Intervention Gap Analysis
  - Peritus International (2011)
  - Quantified Risk Assessment:
    - Peritus International (2011)
  - Geohazard Fault Crossing Assessment:
    - Peritus International (2011)
  - Metocean Definition:
    - Fugro (2011/2012)
  - GIS Data Collection:
    - Fugro (2012)
  - D'Appolonia (2012)
  - Emergency Pipeline Repair:
    - Peritus International (2011)

Route Survey and evaluation
- Reconnaissance Survey Definition & SOW:
  - Peritus International (2012 & 2015)
  - Reconnaissance Survey:
    - Fugro OSAE (2013)
  - Landfall Point Identification:
    - Engineers India Limited 2014
  - Route Optimisation:
    - Peritus International (2015)

Developing Engineering solutions
- Design Basis definition:
  - Peritus International (2010)
  - Flow Assurance Studies:
    - Peritus International (2010 & 2015)
  - Mechanical Design:
    - Peritus International (2010 & 2015)
  - Onshore Compression:
    - Intecsea WorleyParsons (2011)
  - Petrofac (2012)
  - Receiving Terminal:
    - Petrofac (2012)
  - Installation Assessments:
    - Alseas (2015)
    - Saipem (2015)

Independent Review
- Technical Feasibility Workshop:
- Technical Readiness Study:
  - DNV-GL (2017 Ongoing)
  - Technical and Commercial Feasibility Review Study:
    - Engineers India Limited (2017 Ongoing)

SAGE has collaborated with global leaders to develop solutions for MEIDP's technical challenges
Project progress De-risking

- 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/Intecsea/EIL/DNVGL/Saipem/Allseas)
- Technical and Commercial Feasibility Confirmation by EIL is ongoing
- Technical Readiness Confirmation by DNV-GL is ongoing
Financial and Geopolitical De-risking

- Iran should participate in MEIDP by giving strong support to the project as a Gas Supplier.
- Iran Ministry of Petroleum / NIOC / NIGEC should allocate the Gas to SAGE Project formally which would allow long term Gas negotiations by Gas Buyers such as GAIL / Indian Oil Corp. (IOC) / Gujarat State Petroleum Corp. (GSPC) to follow knowing the gas was available.
SAGE is also looking for alternate route from Iran to India via Oman. SAGE has awarded the technical feasibility to EIL to look into this Optional route. EIL has carried out preliminary desktop study of this route. Possible synergy with Iran Oman pipeline is being explored.

SAGE has MOU with Oman Ministry of Oil and Gas since many years.
Summary & Conclusion

- The Technical Feasibility of MEIDP is proven
- Design methods for ultra deepwater pipeline and pipelines in seismic zones are well established
- Mills can and have made pipe to meet MEIDP Requirements
- Vessels are available in the market that can install the pipeline and more are due soon
- Intervention tools to avoid flooding and effect pipeline repair are available
## PROGRAMME – CURRENT TIMELINE (PROVISIONAL)

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award Reconnaissance And Metocean Surveys</td>
<td>Jun 2017</td>
</tr>
<tr>
<td>Commence Reconnaissance Survey</td>
<td>Oct 2017</td>
</tr>
<tr>
<td>Commence Metocean Survey</td>
<td>Oct 2017</td>
</tr>
<tr>
<td>Award Onshore &amp; Offshore FEED</td>
<td>Aug 2017</td>
</tr>
<tr>
<td>Award Detailed Surveys</td>
<td>Oct 2017</td>
</tr>
<tr>
<td>Final Investment Decision</td>
<td>Dec 2018</td>
</tr>
<tr>
<td>Award Linepipe Contract</td>
<td>Dec 2018</td>
</tr>
<tr>
<td>Award Onshore &amp; Offshore EPIC</td>
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<tr>
<td>Start Offshore Construction</td>
<td>Oct 2020</td>
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<td>Start Compressor Station Construction</td>
<td>Apr 2021</td>
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<tr>
<td>Complete Offshore Construction</td>
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<td>Complete Compressor Station Construction</td>
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<tr>
<td>First Gas</td>
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</table>

Project can be set up in a 5 year time span 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 the way ahead

**Phase I**
- MEIDP Completed
  - Origination
  - Feasibility & validation
- MEIDP today
  - Pre-FEED
  - Political alignment of Host Countries
  - Indicative supply/offset commitments
  - Validation of commercial interest and set-up
  - Route corridor
  - Expansion of org
  - Discussions with Pipe Mills and Installation Contractors

**Phase II**
- FEED
  - Technical solution and validated technical concept
  - Route defined
  - Strategic ESIA
- De-risking
  - IGA, HGA negotiations
  - GTA negotiations
  - First permitting, detailed ESIA

**Phase III**
- FID
- Financial close
- Financing
- Engineering & permitting
  - Limited recourse lending contracts
  - Rearrangement of shareholder structure
  - Detailed technical planning
  - Remaining permitting

**Next steps ahead**

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

**Phase IV**
- Start of construction
  - EPC construction
  - Operative licensing
  - O&M contract negotiations

**Phase V**
- Start of operations
  - Commissioning
  - Test and preparation of operation
  - Staff training
  - Ongoing operation and maintenance
Israel signed a preliminary agreement to export gas to Cyprus, Greece and Italy via Mediterranean Sea.

- Approx. project cost is 6 – 7 billion USD.

- Proposed project would be the world’s longest and deepest subsea pipeline. Extending from Israeli and Cypriot offshore gas fields to Greece and Italy.

- Length of pipeline-2200km & max. water depths over 3000m.
Deepwater and Long distance Pipelines with Emergency Repair Systems

<table>
<thead>
<tr>
<th>Project</th>
<th>Location</th>
<th>Year</th>
<th>Water depth (m)</th>
<th>Length (km)</th>
<th>Size</th>
<th>Product</th>
<th>Repair System</th>
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</table>
MEIDP CONCLUSIONS

- Indian gas demand and supply balance **shortfall** continues to increase from 100 mmscmd in 2014 to **270 mmscmd in 2030** as per PNGRB vision 2030 study.
- Iran has 31 mmscmd gas for MEIDP. Iran is also willing to consider to supplying a **2nd SAGE Pipeline**.
- Project will add to energy **security by diversification**.
- Provides an **economically competitive** method of gas supply and **promotes competition** in Indian energy markets.
- The **technology** to design and lay deep sea pipeline is available **now**.
- The project is **financially and technically viable**.
- Long Term contracts and surety of supply, will facilitate **existing** projects in India which utilise the Gas (eg., Power / Fertilizer Plants).
- Project needs **strong diplomatic & political** support from Iranian and Indian Governments.
- Long Term contracts and surety of supply, will facilitate new greenfield projects in India especially **Power & Fertilizer** Sectors.
- Turkmenistan Gas & OVL Farzad B Gas can also come to India through SAGE Pipeline route.
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E-mail : siddhomalage@vsnl.net
www.sage-india.com