

# TRANSNATIONAL GAS PIPELINES INTO INDIA

## *Strengthening Energy Security*



**5<sup>th</sup> World Energy Policy Summit**  
**New Delhi**

*8th December 2015*

*Private & Confidential*

# AGENDA

## **INDIA'S ENERGY SCENARIO**

**NATURAL GAS-** *Demand Supply Gap & Affordability*

**TRANSNATIONAL GAS PIPELINES-** *Long Term Solution*

**TRANSNATIONAL PIPELINES IN INDIA-** *Progress so Far*

## **KEY FINANCING ISSUES**

## **SUMMARY**

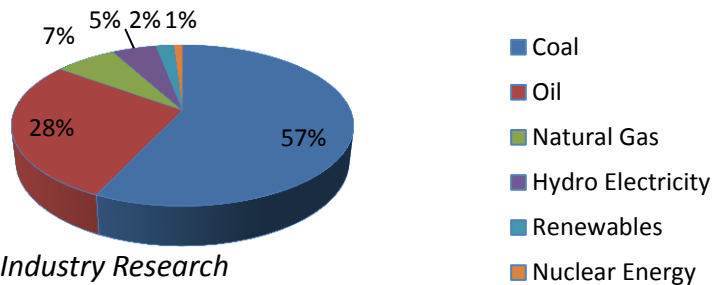
## INDIA'S ENERGY SCENARIO

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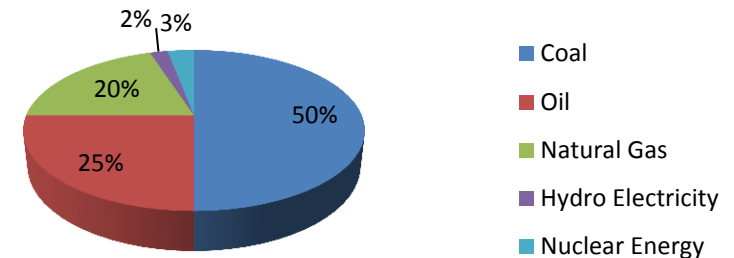
# INDIA'S ENERGY SCENARIO

- India is the 4<sup>th</sup> Largest Energy Consumer in the World (*NG constitutes 7% of India's Energy Basket*)
- Energy Demand to grow with GDP; Indian Economy projected to grow at 7.5% for FY 16 (IMF)
- Natural Gas expected to constitute 20% of India's Energy Basket by 2025 PNGRB Vision-2030**

### Energy Mix of India (Current)



### Energy Mix of India (Projected-2025)



## Energy Sources in India

**COAL:** Coal is the dominant energy source contributing **57%** of the total energy consumption

**CRUDE OIL:** Second major fuel consumed in India; Import Dependency: 78% of Consumption

**NATURAL GAS:** Third major fuel consumed in India;

- Domestic Production of Natural Gas** in India has declined in the recent years from **143 MMSCMD** in **FY2011** to **97 MMSCMD** in **FY2014**
- India has Low reserves of Natural Gas (Proven Reserves of 1.4 TCM, 0.8% of World Reserves)

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## **NATURAL GAS-** *Demand Supply Gap & Affordability*

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# NATURAL GAS- Demand Supply

India has **limited sources** of Natural Gas Supply

- **Domestic Source:** NOCs, Private Fields; Declining/ lower than expected production
- **RLNG:** High Landed Cost; Limited Capacity ; Limited affordability of RLNG
  - Existing Capacity: 22.24 MMTPA (Dahej, Hazira, Kochi, Dabhol)
  - Proposed Capacity : 23.5 MMTPA (Dahej, Hazira, Mundra, gangavaram, Ennore, Dhamra, Kaknada)
- **India needs supply of affordable gas for a long term to address Energy Security Concerns**
- **Increased use of Natural Gas, a Clean & Green Fuel, important to address Climate Change Issue**

- Total demand for Natural Gas expected to increase at a CAGR of 6.5 % 523 MMSCMD by FY 2019
- Bulk of the gas demand is derived from Power and Fertilizer sectors followed by CGD & Industry
  - Power Sector Gas Consumption in FY 2014: 29.55 MMSCMD
  - Fertiliser Sector Gas Consumption Capacity in FY 2014: 48.5 MMSCMD
- RLNG partly bridges the gap; High cost renders it unaffordable for key sectors (Power & Fertilizer)
- **Affordable pipeline Gas from nearby Countries will contribute to meet the supply deficit**
- **Make in India:** Affordable Energy would also provide thrust to manufacturing sector

**Need for Long Term Solution to address Energy Security Concern for India's Economic Growth**

# POWER SECTOR- *Affordability*

- Power plants using RLNG have higher variable charge vis-à-vis Coal Based Plants or those using APM
- Domestic Coal remains the cheapest option at cost of generation followed by Imported Coal
- Competitive Delivered Price of Natural Gas vis-à-vis Coal:
  - Domestic Coal: Natural Gas at USD 3 per MMBtu
  - Imported Coal: Natural Gas at USD 6-7 per MMBtu

## Gas based Power: Requirement of a Long Term Solution

- Cost of generating power from RLNG significantly higher than that from Coal and APM Gas
- Power from RLNG at current prices not competitive with Power generated by Coal based Power Plants
- Above concern visible from 14,300 MW stranded Gas based power plants (PLF: 0% from Apr14- Jan15)
- ~9,845 MW of Gas based power plants using domestic gas had PLF of 32.2% from Apr14- Jan15
- Due to Regulated Power Tariffs & Weak financial strength DisComs don't buy costly Gas based Power
- Affordable long term gas required to produce power at a competitive tariff

Consumption of Natural Gas in Power Sector is governed by Availability & Affordability

# FERTILIZER & CGD SECTORS- *Affordability*

## Gas Based Fertilizer Plants: Current Scenario

- Supply deficit of Urea being met through import of high cost Urea
- Present Gas Consumption by Urea Plants: 66%- Domestic Gas, 34%- RLNG
- Higher Gas price results in Higher Subsidy outgo
- New Investment Policy on Urea to increase domestic production to attain self sufficiency in Urea
- Thrust on development of gas based fertilizer plants
- Investment of Rs 40,000 Cr envisaged; availability & affordability of gas critical for the sector

## Requirement of Long Term Solution

- The new Urea Investment Policy enables the manufacturers to use RLNG as primary fuel
- However, only 2 Projects have made some Pre-implementation Progress in the past 2.5 years

## City Gas Distribution

- Gas for **City Gas Distribution** sourced primarily from LNG
- Domestic Gas allocated for CNG & PNG (Domestic Use), subject to availability
- Presently RLNG is not affordable for PNG (Industrial Use) as it needs to compete with FO
- Currently 23 CGD entities operating in 47 GAs
- As per Vision 2020, PNGRB plans to cover over 300 cities all over India
- However, long term gas availability at affordable price critical for development of the CGD Sector



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## **TRANSNATIONAL GAS PIPELINES- *Long Term Solution***

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## TRANSNATIONAL PIPELINES- *Key Contributor to Energy Security*

### Vital to address India's Energy Security Concern

- Energy Security Critical for achievement the desired GDP growth of 9-10%
- Transnational Pipelines secure **Long Term Supply of Gas** for India
- Long Term **Affordable Gas** for the key sectors (**Power, Fertilizer and City Gas Distribution**)
- **Availability of affordable clean fuel critical to meet the target of reduction of CO2 emissions**

#### Power Sector

- **~24,000 MW- Gas based power plant capacity**
- Production Cost lower by  $\approx$  Rs 1.50 unit  
*(Pipeline vis-à-vis RLNG)*
- **Affordable Gas to increase power production**

#### Fertilizer Sector

- **Secures gas for New Investment Policy for Urea Manufacturing**
- Envisaged Investment of Rs 40,000 Cr
- $\Delta$  USD 1/ MMBtu in gas  $\rightarrow$   $\Delta$  USD 20/ MT

### City Gas Distribution

- Increasing focus of Govt. to establish CGD networks
- Gas through pipelines to positively impact viability of CGD Companies and affordability of SMEs

## Transnational Gas Pipelines- A step forward for India's Energy Security

# COST COMPETITIVENESS- Pipeline vs RLNG

## RLNG

- LNG forms a significant constituent of Gas Supply in India
- Additional Cost Component attributable to Imported LNG:
  - Liquefaction and Regasification of gas: ~ 3.5– 4.5 USD/ MMBtu
  - Transportation of LNG: ~ 1 USD/ MMBtu

**Additional cost of around 4.5- 5.5 USD/ MMBtu over and above the price of gas**

## Transnational Gas Pipeline

- Development of a permanent International Gas Transport Corridor
- Tariff for such a Project calculated on the basis of Target Return Equity

**Estimated Tariff ~2- 2.25 USD/MMBtu**

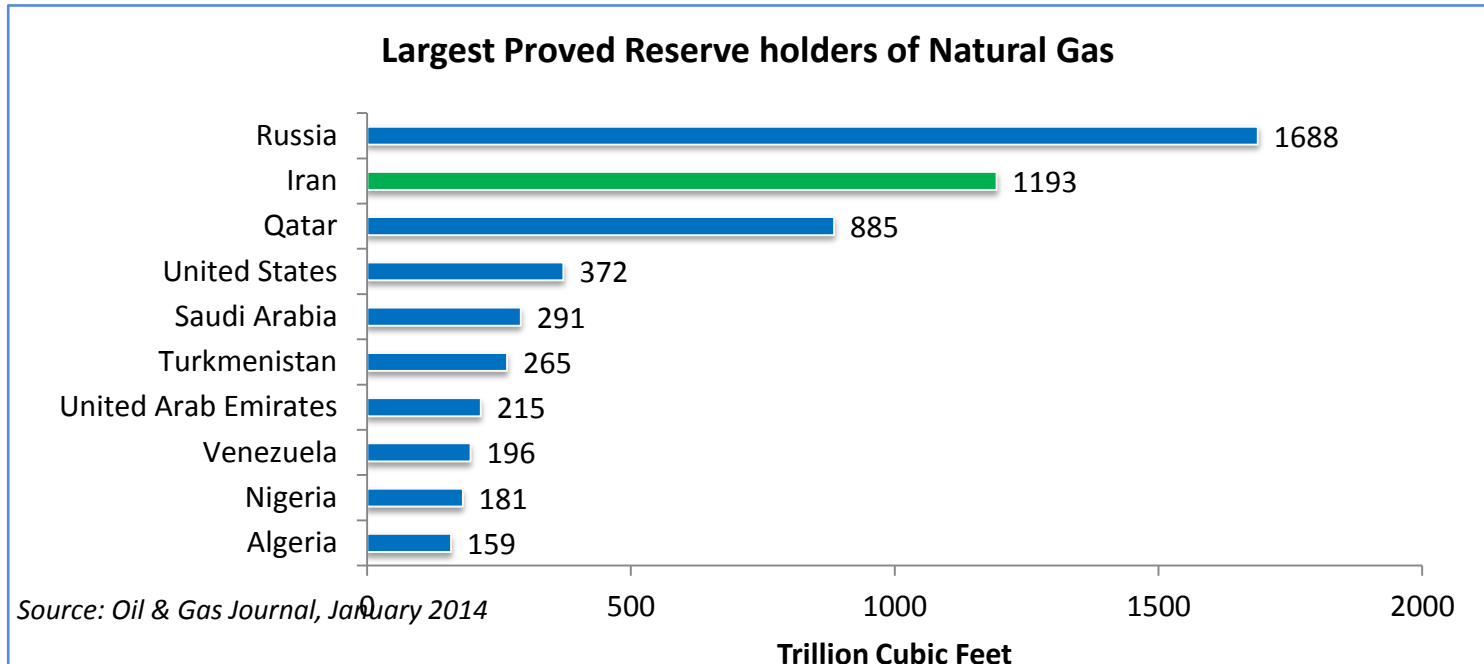
**Gas transportation through pipeline is more economical viz. a viz. imported LNG**

**Transnational Gas Pipeline- Long Term Affordable Solution for Price Sensitive Indian Gas Market**

Source: Public Domain / Research Publications

# MIDDLE EAST- Gas Available in Abundance

- Over 2000 TCF of Natural Gas is held by the countries with which India has trading relationships
- High success rate of natural gas exploration at 79% viz. a viz. World Avg. of 30%- 35%
- Gas Rich Middle East Countries looking for new export markets
- Onshore Cross Country Gas Pipeline have significant Geo- Political Issues



**Middle East Countries have abundant gas for export;  
Need Significant Demand & Reliable Infrastructure to commercially exploit the gas reserves**

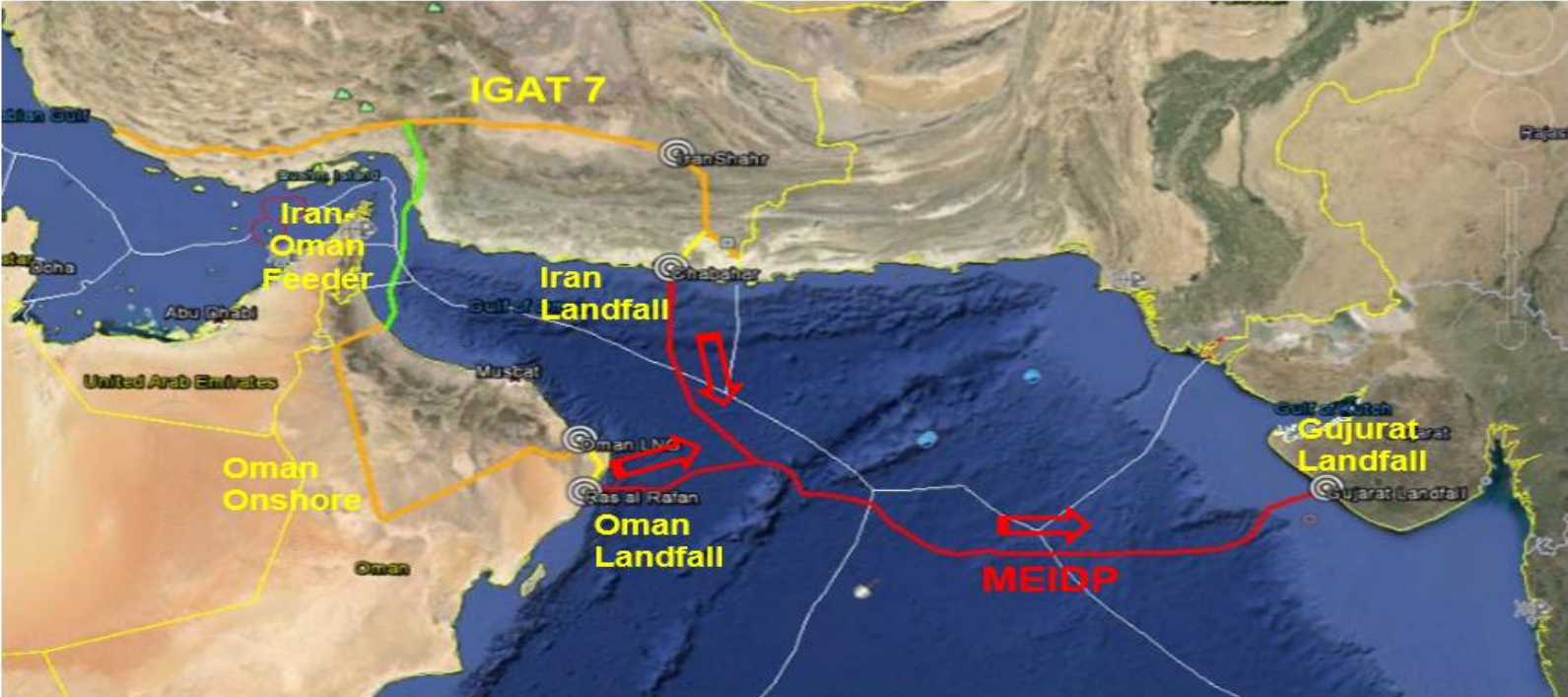
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## **TRANSNATIONAL PIPELINES IN INDIA- *Progress so Far***

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# MEIDP- Introduction

<b>Project</b>	Middle East to India Deep- water Pipeline Project
<b>Sponsor</b>	Proposed by South Asia Gas Enterprise Pvt Ltd (SAGE)
<b>Proposal</b>	Transportation from Middle East to India
<b>Proposed Route</b>	Middle East Port to Porbandar Port (South Gujarat) in India, via Arabian Sea



Source: SAGE

# MEIDP- Specifications & Timeline

## Specifications

- Length: ~1300 km
- Max Depth: ~ 3500 meters
- Internal Diameter: 24"; Wall Thickness: 32.9 mm -40.5 mm
- Flow Rate: 1.1 BSCFD (31.1 MMSCMD)

## Project Implementation Timeline

**5 Years** (including 2 Years of Construction Period)



## Present Status of the Project

- Feasibility Study completed- by Peritus International Ltd
- Financial Advisory Services- by SBICAP
- Indian Gas Market Assessment- by CRISIL
- Reconnaissance Survey- by FUGRO
- MoUs signed b/w SAGE and agencies like NIGEC, SAIPEM, WELSPUN, EIL, GAIL

# MEIDP- Next Step



- Considerable progress made in terms of initial feasibility, surveys, finalisation of route, etc.
- Project acknowledged by various key stakeholders
- Significant amount of investment made by the Sponsor

## Next Step

- Onshore & Offshore FEEDs + Detailed Geo-Physical Survey to be carried out
- **Signing of Framework Agreement (FA)**
- Draft Framework Agreement has been finalised based on discussions with various agencies
- FA signing a pre-requisite to sign inter-related agreements like GSPA, GTA for implementation of the Project
- Framework Agreement, Non- Binding, would lead to finalization of broad principles regarding implementation of the Project by the Signing Parties
- Other agreements viz. GSPA, GTA to be executed so as to finalize financing arrangement for the Project



# OTHER TRANSNATIONAL GAS PIPELINE PROJECTS

## TAPI

- **Route:** From Turkmenistan through Afghanistan, Pakistan before finally entering India.
- **Length:** 1814 kms
- **Capacity:** 38 MMSCMD supply to India for 30 years.
- **Status:** Two Government level agreements signed amongst four member nations
  - Gas Pipeline Framework Agreement
  - Inter Governmental Agreement
- GAIL has signed a bilateral GSPA with Turkmen Gas

## IPI

- **Capacity:** Supply to India of 30 MMSCMD in Phase-I and 60 MMSCMD in Phase-II; Total 90 MMSCMD
- **Source of Gas:** Iran
- **Status:** In conceptualization phase; Political constraints to be resolved

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## KEY FINANCING ISSUES

# KEY FINANCING ISSUES (1/2)

- **Interdependence/Synergy of Participating Governments**
  - Long Term Gas availability outlook in Seller Nation
  - Long Term Gas demand outlook in Buyer Nations
  - Efficiency of Transmission Infrastructure & Competitiveness vis-à-vis Alternate Sources
  - Enforceable Contractual Framework among Governments, Gas Buyers & Sellers
- **Geopolitical Scenario**
  - Political & Local changes in participating Nations may materially affect Project's long term viability
- **Terrain Variance & Construction**
  - Wide variety of terrain across participating Nations could pose challenges in terms of Construction, Time & Costs affecting key viability parameters
- **Identification of Consortium Lead for Project SPV**
  - Geopolitical uncertainty and coordination issues among various Sovereign, Commercial and Regulatory Agencies could discourage participation of experienced players of International Repute
- **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 FINANCING ISSUES (2/2)

- **Financing tie-up of Project**
  - Long gestation period
  - High construction risk
  - Difficulties in coordination
  - Security enforcement risk
  - Sourcing & demand risks
  - Political risks
- **Transit Taxation & Custom Duty issues**
  - Movement of Gas across International Borders could attract duties at multiple transit points
  - Federal & State Levies in participating Nations (GST/Local taxes/Entry Tax) under multiple tax laws
- **Approvals under Multiple Authorities**
  - Project construction & operations would require various approvals & clearances from Statutory & Local Bodies of participating Countries

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## SUMMARY

# SUMMARY (1/2)

- Energy Security Critical to India for achievement of the desired GDP growth of 9-10%
- Long Term **Affordable Gas** for the key sectors (**Power, Fertilizer and City Gas Distribution**)
- Limited Supply of Gas from current sources
  - Domestic Production declining / lower than expected due to limited reserves/ declining fields
  - Limited RLNG Capacity accompanied by high cost of RLNG
- India surrounded by ~2000 TCF Natural Gas (Iran, Qatar, Turkmenistan) within pipeline distance

## Dedicated Energy Corridor

- Provide an International Energy Corridor dedicated to India
- Projects would play Key Role in ensuring India's Energy Security

## Long Term Affordable Gas

- Provide long term gas supply at affordable price
- Critical for Key Sectors viz. Power, Fertilisers, CGD pivotal to the growth of the Indian Economy

## Clean Fuel to Reduce Carbon Emissions

- PNGRB Vision: Increase NG consumption to 20% of Energy Basket by 2025
- Availability of affordable Natural Gas, a clean fuel, would help in achieving the Reduction in Carbon Emissions to address Climate Change/ Global Warming Concerns

# SUMMARY (2/2)

## Complementary to National Gas Grid

- Vast network of National Gas Grid being created in India
- Gas Grid may remain unutilized in absence of affordable Gas
- LNG & Domestic gas cannot fully utilize the pipeline network

## Make in India

- Indian Pipe Mills capable of manufacturing thick steel pipe for the Project
- Contribute to “Make in India” Campaign

## Focus on Gas Pipelines in Asia

- During last 10 years China has built transnational gas pipeline from Myanmar/Turkmenistan/Russia/Central Asia
- China receives 335 MMSCMD (75 MMTPA) Natural Gas through Transnational Pipelines

## Geo- Political Feasibility

- Under sea pipelines through International Waters may have better geo-political feasibility over other transnational pipelines

## Government Support

- Government Support critical for success of such transnational gas pipeline
- Severe competition from other Countries/ International Oil Cos. to access untapped Gas Resources

**Transnational Gas Pipelines provide Long Term Solution for *Availability of Affordable Gas***

# THANK YOU



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*8th December 2015*



# PROJECT EXECUTION ROADMAP (1/2)

## Phase I

- **Inter Government Agreement (IGA)**
  - Commitment to Cooperate between Gas Seller & Buyer Countries;
  - Sale & Purchase Commitment
- **Gas Pipeline Framework Agreement (GPFA)**
  - Project Development Principles; Foundation for Host Agreements (HA)

## Phase II

- **Heads of Agreement (HoA)**
  - Between Commercial Entities of respective countries; Basis for Commercial Agreements
- **Gas Sales & Purchase Agreement (GSPA)**
  - Commercial Terms viz. quantity, price, Take or Pay obligations etc.

## Phase III

- **Appointment of Transaction Advisor**
  - Assist in structuring pipeline consortium
- **Identifying Consortium Lead**
  - Provides technical expertise, Project Execution, Operational know-how and Financing
  - Reputed & Experienced International Company.
- **Consortium Agreement**
  - Sets up Consortium & provides Shareholder rights & responsibilities
- **SPV Formation**
  - Build pipeline on DBFO Basis
  - Led by Consortium Lead with Equity participation of each Country

# PROJECT EXECUTION ROADMAP (2/2)

## Phase IV

- **Host Country Agreements (HCA)**
  - Between Consortium & each host Government;
  - Sets up rights for the Consortium(land, taxes, people etc.)
- **Transportation Agreements**
  - Between SPV & Gas buyer Companies
  - Transportation between delivery point & re-delivery point
  - Sets out terms viz. Tariff, Ship or Pay obligations, Capacity Reservation, Quantity etc.
- **Securing Project Financing**
- **Award of EPC Contract**

## Phase V

- **Construction**
- **Testing & Commissioning**
- **First Delivery**

# PROJECT FRAMEWORK & GOVERNING CONTRACTS

## Inter-Government Agreement + Gas Pipeline Framework Agreement

