

# Volco

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# POWER

VISIONS OF A CLEANER FUTURE



## 2023 COMPANY PROFILE

[www.volcopower.com](http://www.volcopower.com)

NATURAL GAS



# COMMITTED TO PROVIDING INDUSTRY WITH COMPLETE END TO END POWER & GAS SOLUTIONS

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**Volco Power** was formed to capitalize on the challenges of energy demands experienced in South Africa and the African continent. Prior to this establishment, the founders of the company conducted an extensive four-year search for the most dynamic international companies to partner in supplying cost effective and reliable natural gas solutions for Africa.



**Volco Power** is supported by a unique set of partners in the USA, Canada, Europe and South Africa that enables them to provide full end to end natural gas and power delivery solutions. With the support of their partners and affiliates, they are able to provide clients with support services that extend to the delivery of cheap natural gas while enabling clients to drive down overall costs of operations.



**Volco Power's** ultimate strength lies in its ability, through its South African and international associates and contracted partners, to work as a team with extensive management, engineering and international experience to deliver high quality services to the gas & power industry.



**Volco Power** is committed to becoming a key contributor in supplying industries and surrounding communities with sustainable low-cost natural gas. Recognizing that the continent is in dire need of new power generation, Volco Power is positioned to providing clients with a complete end to end solution to delivering natural gas to new power projects and industrial off-takers.



## VISION STATEMENT

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VOLCO POWER IS COMMITTED TO PROVIDING:

Obtain full working liaisons with Supply and Operations companies servicing the gas and energy industry

A technically innovative and cost-effective solution for our clients

Ensuring client satisfaction during the design, purchasing, construction and commissioning phases of project execution

Continued client support through all facets of the project life cycle

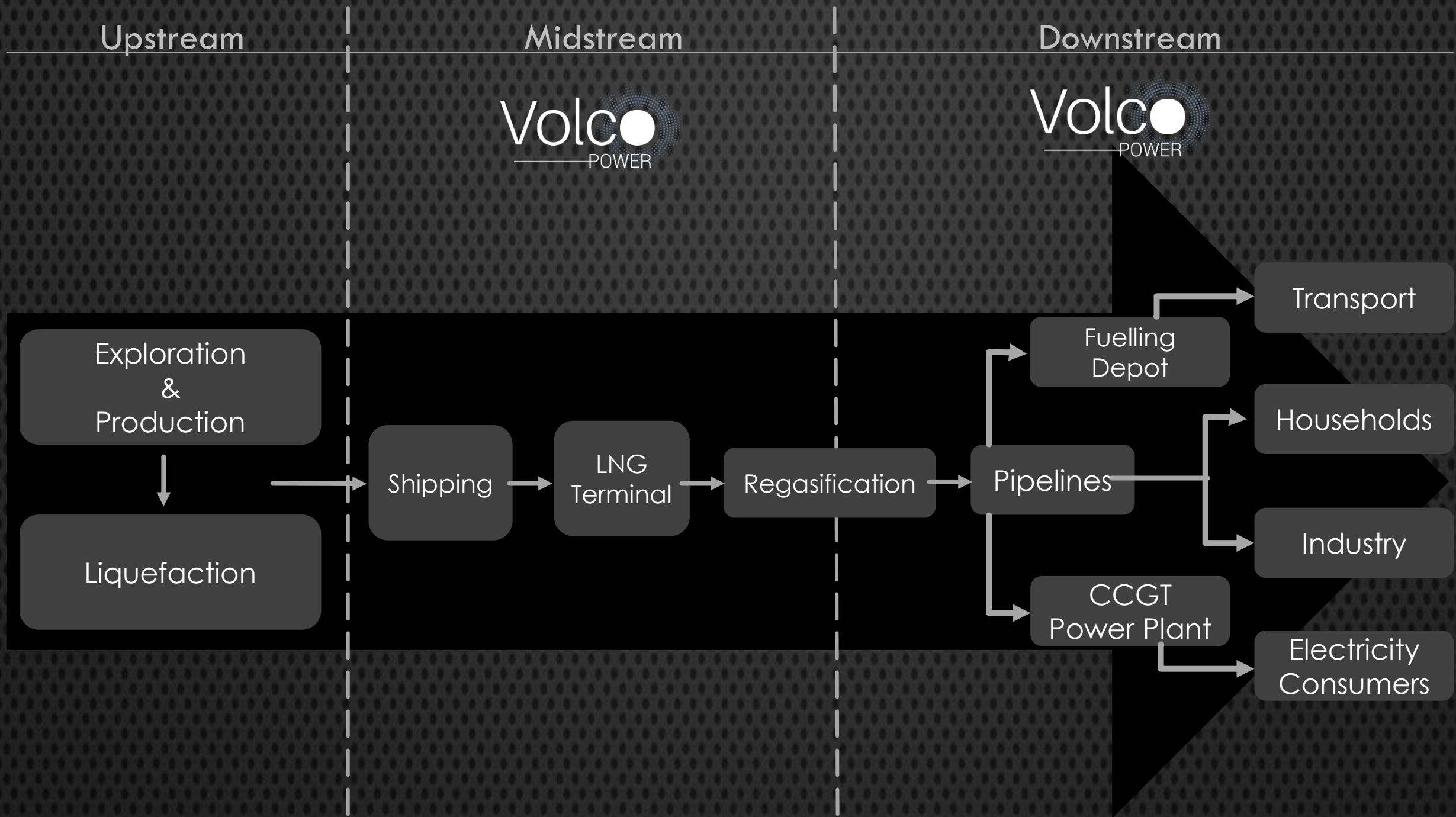
Continually improving the product and keeping trend with the latest developments regarding product development

**Volco**  
POWER

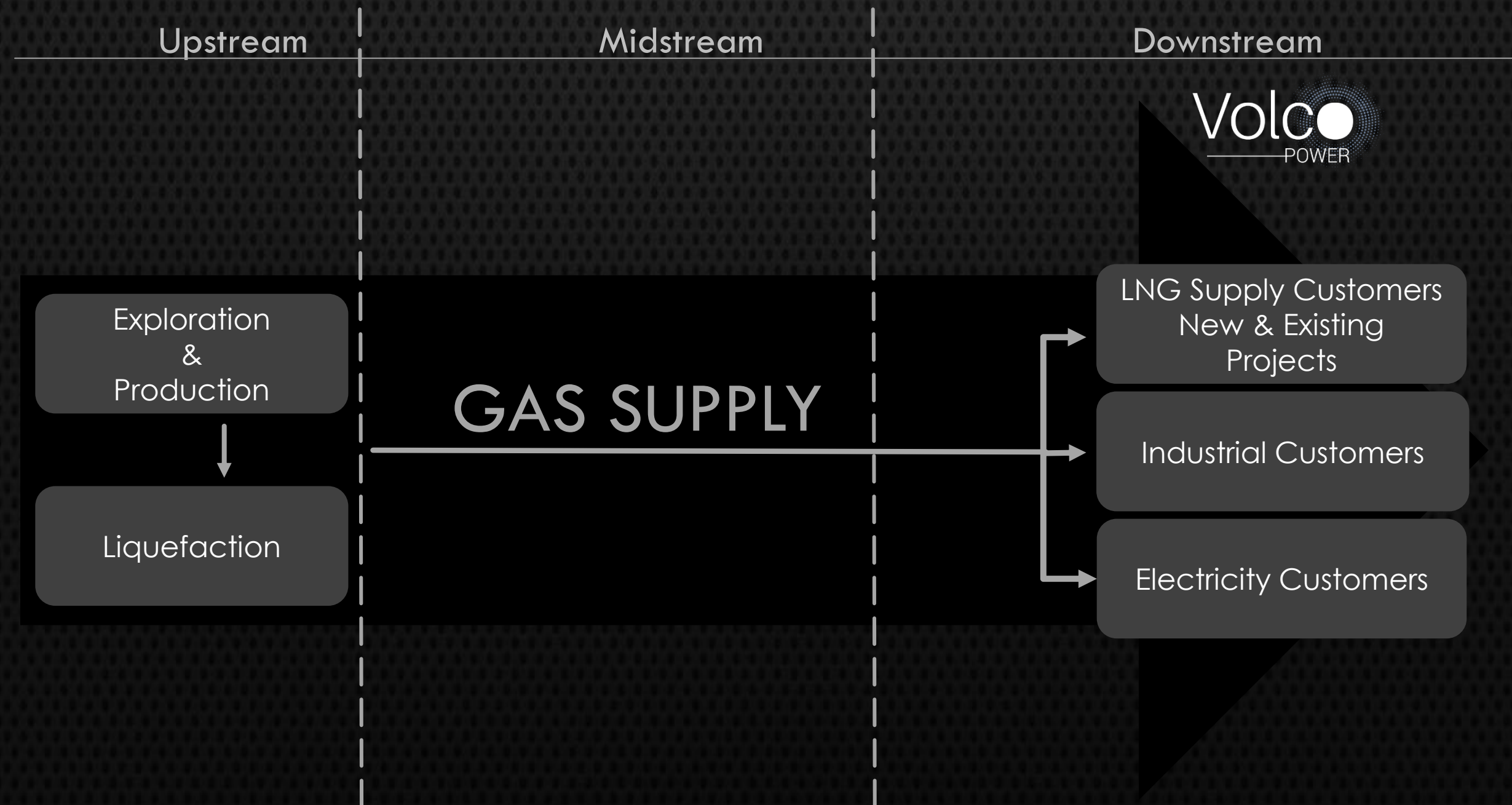


# BUSINESS MODEL

## Business Development



## Gas Supply





# SERVICES

## LNG Supply

- Bulk
- Containerized



## Consulting Services

- Business Development
- Early Stage Project Development

## Pre-FEED & FEED Studies

- Natural Gas Projects
- Power Projects

## Conceptual Design & Full Design Engineering

- System Optimization
- Loading Facilities
- Gas Transfer Systems
- In-Ship Containment Systems
- LNG Carrier Ships (3<sup>rd</sup> Party Ship Design)
- Gas Transfer Systems at Unloading Jetty
- Unloading Facilities
- Gas Storage – LNG & CNG
- Pipelines
- Input for Marine EIA's
- System Optimization
- Business & Financial Modelling





# LNG SUPPLY

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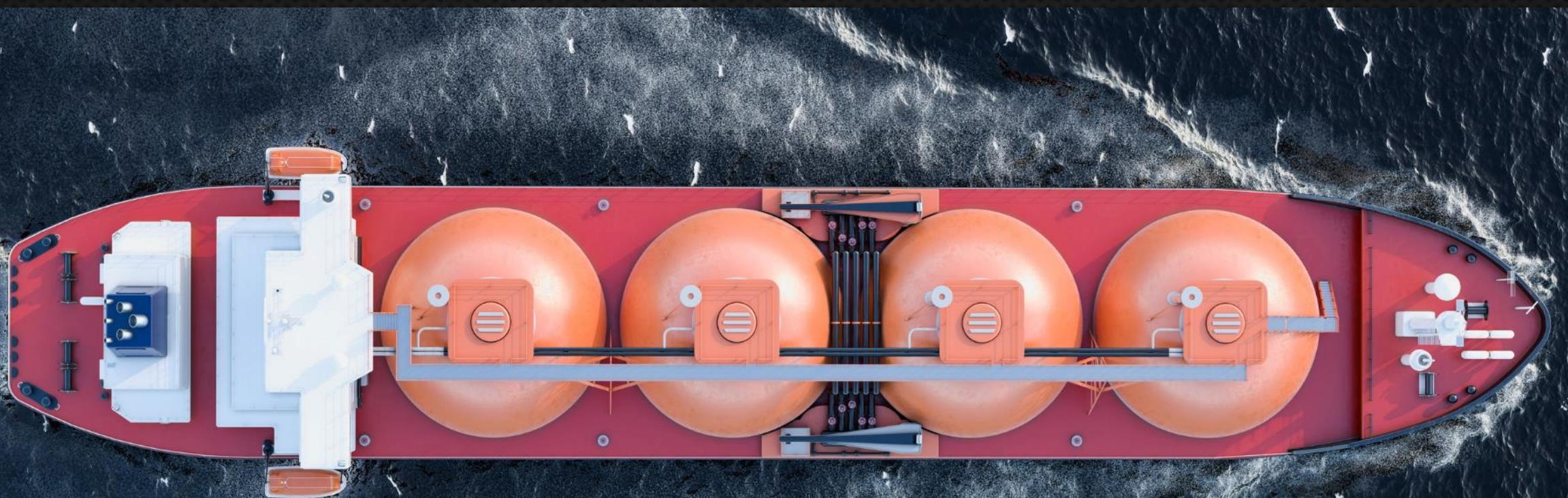
## VOLCO POWER WORK WITH INTERNATIONAL LNG SUPPLY COMPANIES TO PROVIDE A COST EFFECTIVE AND RELIABLE SUPPLY OF LNG



In order to achieve a competitive pricing structure for delivered LNG to Africa, each project will require a full end to end solution “Virtual Pipeline” comprising of a competitive FOB gas price from an LNG terminal, shipping of the gas and the necessary infrastructure for regasification and offloading of the gas at port or off shore



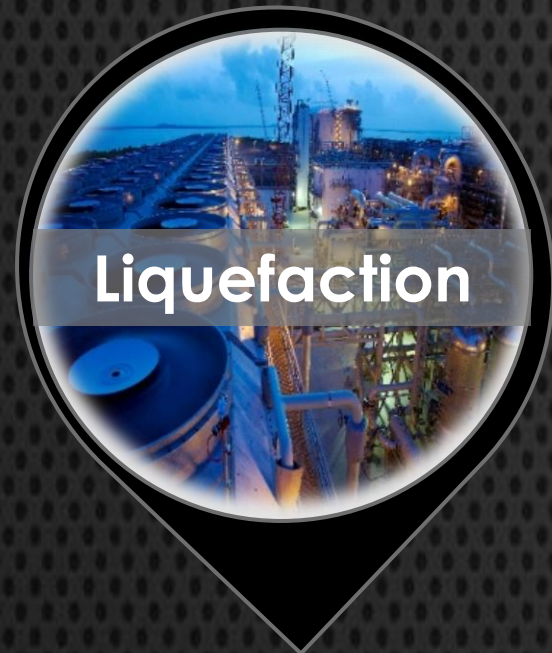
**Flexible arrangements with international partners and associates allows us to design a “Virtual Pipeline” that extends from gas supply to shipping to regasification and then final delivery**



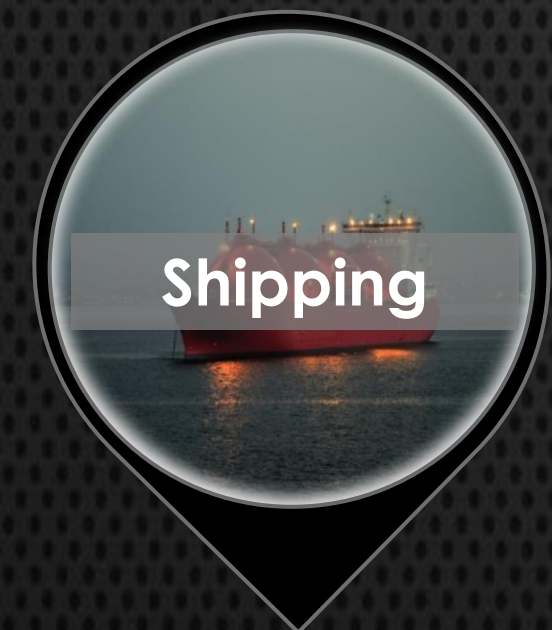




Piped gas will be provided to the LNG terminal. The raw feed gas supply arriving must be clean and dry before liquefaction can take place. It is scrubbed of hydrocarbon liquids and dirt and treated to remove trace amounts of two common natural gas contaminants: hydrogen sulfide and carbon dioxide. Next, the gas is cooled to allow water to condense and then further dehydrated to remove even small amounts of water vapor.



The clean and dry gas may then be filtered before liquefaction begins. It is important that the gas consist primarily of methane with only small amounts of light hydrocarbons to ensure an efficient process. Liquefaction takes place through cooling of the gas using heat exchangers. In these vessels, gas circulating through aluminum tube coils is exposed to a compressed hydrocarbon-nitrogen refrigerant. Heat transfer is accomplished as the refrigerant vaporizes, cooling the gas in the tubes before it returns to the compressor. The liquefied natural gas is pumped to an insulated storage tank where it remains until it can be loaded onto a tanker.

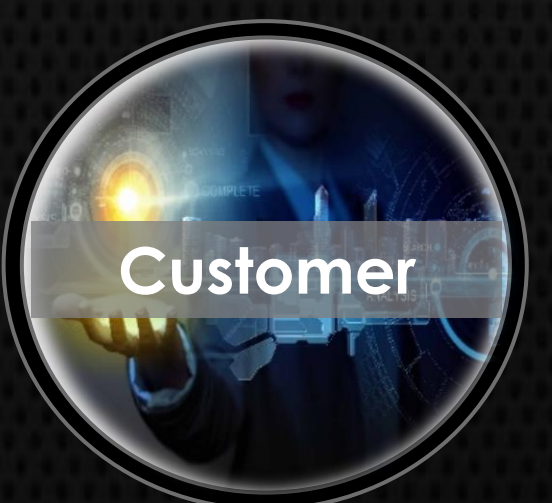


LNG from the terminal is loaded onto a LNG vessel that has specialized cryogenic handling equipment and cargo containment systems that enable the vessel to carry Liquefied Natural Gas that is cooled to  $-161^{\circ}\text{C}$ . Because LNG occupies about 1/600 the space of methane in its gaseous form, it can be transported in large quantities in efficient, purpose built tanker ships or in portable tanks. Transportation accounts for 10 to 30 percent of the cost of the LNG value chain. Therefore it would make sense that part of the design criteria for each project, the carrier ships are design engineered for each project and contracted by a commercial shipping company to supply a full end to end LNG delivery solution.



There are several different options for Regasification of LNG that can be used and will be project specific. The design engineering for the optimal solution will depend on met ocean conditions at site and consist of the following:

- Floating re-gas and Storage Units (FSRU's)
- Land based terminals
- Floating Barge
- Off shore storage and re-gas



Power generation projects  
Industrial consumers of Natural Gas



# BULK SUPPLY

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With a rapidly evolving LNG market, newer vessels are being designed and built to incorporate continuous technical innovations, including, increased capacity, more efficient hull designs and propulsion systems, enhanced cargo insulation and improvements of on-board control systems.



Transportation accounts for 10 to 30 percent of the cost of the LNG value chain. Therefore it would make sense that part of the design criteria for each project, the carrier ships will be design engineered and then contracted with a commercial shipping company on a long-term basis to supply a full end to end LNG delivery solution.

LNG carriers in service are fitted with independent cargo tanks and with membrane tanks. LNG carriers are generally specialized ships transporting LNG at its atmospheric pressure boiling point of approximately -162 degree C, depending on the cargo grade. These ships are usually dedicated vessels, but some smaller examples may also carry basic LPG cargoes. If an LNG ship is capable of carrying basic LPG cargoes, a liquefaction plant is installed to handle the boil-off LPG cargo vapors.

LNG carrier designs were typically in the range 80-135,000 m<sup>3</sup> up until 2006. In 2006 the first LNG ships of over 200,000m<sup>3</sup> and 250,000 m<sup>3</sup> were being constructed.





# CONTAINERIZED SUPPLY

ISO Containers are designed with highly engineered thermal insulation and a rugged, durable construction that ensures low-pressure, low-temperature liquid has a safe journey when traveling long distances for extended periods of time. With versatility in mind, LNG ISO Containers are intermodal, optimized specifically for transporting Liquefied Natural Gas (LNG) worldwide by rail, sea, and road.

These reliable, low-maintenance containers come in a variety of working pressures, carry up to 43,000lbs (19,500kg) (gross) and are currently offered in either 20 or 40-foot lengths. All containers comply with important codes and standards including ASME/DOT, RID, IMDG, ADR, ISO, and TPED.

## **BENEFITS OF CONTAINERIZED LNG:**

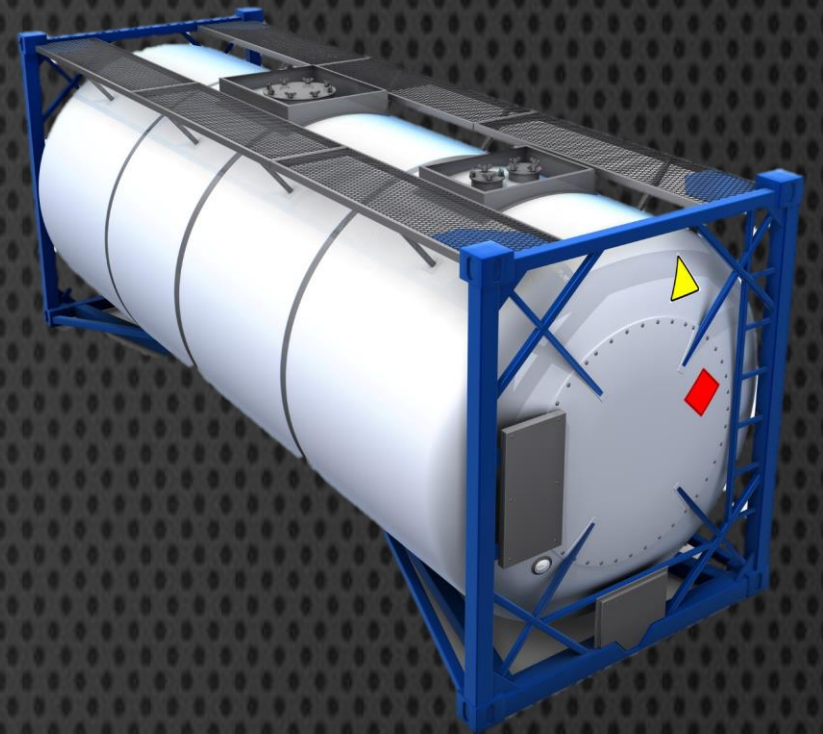
- No transfer of LNG from ship to storage etc.
- Handling of containers is standard practice in container ports
- Uses existing infrastructure

## **40' ISO LNG TANK CONTAINER:**

- 33.4 m<sup>3</sup> LNG at 82% filling rate
- Up to 80 days unattended holding time
- Dry quick couplings for liquid, vapor and safety valves with integrated break-away couplings
- Pneumatic ESD valves for liquid and vapor
- IMDG container for sea, rail and road transport
- Class approved type C tank according to IGC code
- Suitable for stacking 6 high in container stacks
- Fully Ex-proof; no electric installation on the container

## **INSULATION:**

- Vacuum insulation between inner and outer tank
- The inner tank is wrapped in multi-layer super-insulation reflector foil to prevent heat ingress into the inner tank
- The pipe connections and the supports of the inner tanks are designed for frequent and fast cool-down and filling cycles
- Integrated pipe coil in the inner tank for LNG cooling with liquid N<sub>2</sub>





# PRE-FEED AND FEED STUDIES

## Conceptual Design & Full Design Engineering

THE KEY DELIVERABLES FOR A PRE-FEED STUDY WILL BE A TECHNICAL PROJECT FEASIBILITY ASSESSMENT AND A COST ESTIMATE TARGETED TO AN ACCURACY OF +30% / -15% AT A 90% CONFIDENCE LEVEL.

The final "evaluation" phase is to commission a *full FEED* study, designed to provide the project ownership groups with ship, layout and facility drawings such that they can go to manufacturers for pricing and detailed design, as well as enough information to make a final investment decision in the project, including but not limited to all aspects of the project including existing facilities, Compression, Liquefaction, Storage, Loading, Shipping, Jetties, Unloading, Licensing and Permits etc. This will result in an estimate of Tolls to approximately +/- 10% (steel and ship prices are subject to prices at time of ordering typically).



### System Optimization

- Validation of delivery volume requirements and voyage distance
- Ship cost modelling and validation
- Ship speed vs. power optimization
- Onshore/Offshore storage volumes required

### Loading Facilities

- Location of Facilities
- Ship size validation for jetty
- HAZID
- Design of Facility
  - Preliminary Plot Plan
  - Compression requirements
  - Storage requirements
  - Preliminary facility design
  - Cost estimate
- Design of gas transfer systems
  - Sizing of loading arms
  - Cost estimate

### Gas Transfer Systems

- Technology selection
  - Ship to ship
  - Ship to shore
  - Weather and ocean conditions

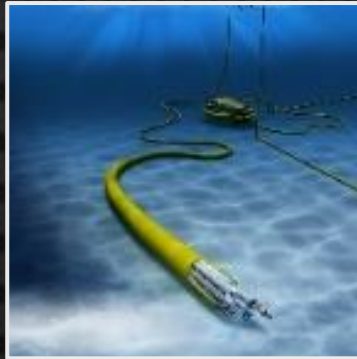


# Pipelines



- Design
  - Sizing
  - Cost estimation

# Input for Marine EIA's



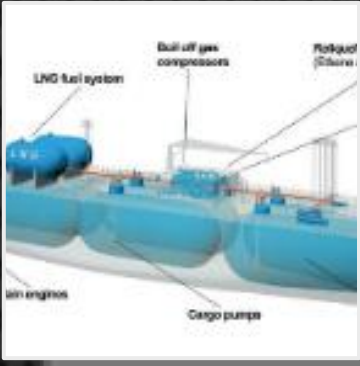
- Scoping study input for first phase EIA input
- Technical assessments and data

# Business & Financial Modelling



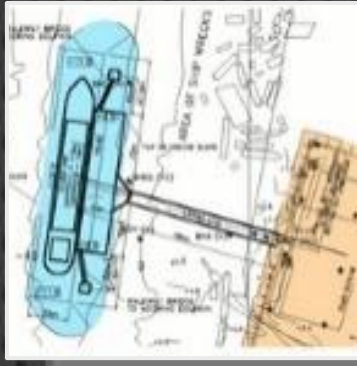
- Robust financial modeling for pre-feed assessments
- 3<sup>rd</sup> party audited financial model for Bankable Feasibility Study

# LNG Carrier Ships



- Ship cost estimation
- Ship sizing and design

# Unloading Facilities



- Location of Facilities
  - Ship size validation for jetty
  - HAZID
- Design of Facility
  - Preliminary plot plan
  - Compression requirements
  - Storage requirements
  - Preliminary facility design
  - Cost estimation
- Design of gas transfer systems
  - Sizing of unloading arms
  - Cost estimation

# Gas Storage – LNG & CNG



- Design of gas storage systems
  - Sizing of containment
  - Cost estimation



# CONSULTING SERVICES

## Gas & Industrial

Business Development  
Business Advisory Services  
Financial Modelling  
Conceptualization of projects  
Assessment of viability of projects  
Pre-Feasibility Assessments  
Feasibility Studies  
Full Project Development (Power & Gas)  
Front End Engineering & Design  
(Power & Gas)



## Conversions from existing fuels to Natural Gas – Industrial

Light & Heavy Industry  
Processing Plants  
Manufacturing Plants  
Mining operations  
Power Plants  
Logistics  
Ships  
Long-haul Trucks  
Busses  
Heavy Mining Trucks & Equipment





# PROJECT DEVELOPMENT SERVICES

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Gas

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## EARLY STAGE DEVELOPMENT SERVICES:

- Market and product research internationally
- Assessment of alternative technical power and fuel supply solutions
- Conceptualizing holistic project structures and technical and financial approaches, including the successful presentation thereof
- Selection and analysis of business opportunities
- Negotiation of supply agreements
- Development of Business Proposals and Presentations
- Development of Investment Grade Business Plans
- Development of Detailed Financial Models
- Directing early feasibility studies
- Sourcing development funding
- Networking, and development of business relationships, locally and internationally
- Developing & Sustaining key relationships
- Seek new customers in company target markets through research, direct marketing and networking with potential customers

## EXPERIENCE AND REPRESENTATION

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# COMPANY CONTACTS

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