Mechanization of Porbandar Port

Port, Port Services and Logistics
Government of Gujarat
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What is Mechanized Handling?

- Efficient handling of dry-bulk cargo through the use of mechanized equipment such as ship unloaders/loaders, conveyor belts, stackers, reclaimers and wagon tipplers.

Mechanization at Porbandar Port

- The GMB devised a proposal to mechanize the existing facility to improve productivity of cargo handling.
- Till now majority of the cargo is being handled through conventional equipment, which adversely affect efficiency parameters such as average ship turnaround time, berth occupancy and output, and resulted in cargo contamination, pollution and fire hazards.
- Mechanized handling at Porbandar Port will require the installation of the following equipment at various stages of the cargo handling value chain.

- Ship to Barge
  - Floating Crane
- Barge to Jetty
  - Mobile Crane
- Jetty to Truck
  - Mobile Hopper
  - Pipe/Belt Conveyor
- Stacking Area
  - Stacker-reclaimer
- Dust Suppression
  - Fog cannon

- Apart from this a storage shed, truck and wagon loading systems would also required to be installed at the port.

Porbandar Port: Brief Overview

- Porbandar port is an all-weather, direct berthing port, owned and managed by the Gujarat Maritime Board (GMB).
- It is located in the West coast of Saurashtra Peninsula, at Porbandar district, Gujarat.
  - Latitude: 21° 38’ N
  - Longitude: 69° 37’ E
- It provides direct berthing facility upto 50,000 DWT ships.
- The port primarily imports: Coal, LPG and Wet Dates
- The port mainly exports: Salt, Cement/ Clinker, Clay Bauxite, Onion, Raw cotton, Soda Ash, Marine Product etc.

Note: Extent of mechanisation will be dependent on land availability on the backside of jetty.
India has 12 major ports and 200 notified non major ports.

In 2014-15, out of 200 non major ports, 69 ports handling cargo traffic.

From April 2015 to December 2015, India’s major and non major ports handled around 786 million tonnes (MT) of total cargo.

Major ports of India handled a traffic of 447.05 million tonnes (MT) from April 2015 to December 2015.

Major ports of India have improved their efficiency of operation particularly in terms of turnaround (TRT). The average turn around time (Port A/c) improved from 2.4 days in 2000-01 to 2.13 days in 2014-15.

India is the seventeenth in terms of world tonnage in the world.

India has the coastline which accounts than 7,517 km long.

Most of the cargo ships which navigates to East Asia and America, Europe and Africa passes through Indian territorial waters.

Gujarat has an advantage of longest coastline account approximately 1600 km in India.

Gujarat accounted around three fourth of the total traffic handle by non major ports followed by Andhra Pradesh and Maharashtra.

Gujarat has the highest number of operational ports & commercial cargo ports.

First State to take up Port Privatization in the Country.

First State in India to have a dedicated Chemical Terminal.

State has also World’s largest ship recycling yards at Alang.

Source: Ministry of Shipping, Goi, Annual Report 2015-16.
Rapid growth in imported coal volumes present an attractive business potential of mechanized handling systems at Porbandar port that primarily handles coal.

Coal consumption and imports by India are expected to witness robust growth rates owing to greater demand from thermal power plants and industrial setups. This is expected to increase cargo traffic at various coal-handling ports.

The power sector constitutes largest share of coal consumption in the country.

Coal constitutes 15% of the total cargo volume handled at Porbandar port in FY16.

Total cargo handled at Porbandar by GMB Ports: 2.8 MMTA (2015-16)

Cement/Clinker, Coal and Bauxite are the prime commodities handled at the port comprising about 80% share in the total cargo.

Import of coal from Indonesia and China and its export to Maharashtra is the main traffic movement at the port.
Market Potential
Demand Supply of Bauxite

India Ranked 5th in World Bauxite ore producer

Bauxite consumption and import by India are expected to grow due to increase in demand from mineral based company in India.

The growth of the Indian bauxite industry reflects the growing demand for aluminium in various end-user markets which includes power generation, durable goods and transport industry in the country.

In FY15, Import of bauxite has increased drastically from 0.43 MMTA to 1.8 MMTA.

India ranked 8th world largest reserved base for bauxite accounting 5% of total world production.

Bauxite handling at Porbandar port is expected to reach 5 MMT by FY 20.

Total cargo handled at Porbandar Port by GMB Ports: 2.8 MMTA (2015-16)

Bauxite constitutes 60% of the total cargo volume import at Porbandar port in FY16.

Cement/Clinker, Coal and Bauxite are the prime commodities handled at the port comprising about 80% share in the total cargo.

Bauxite is mainly exported to China, Japan & Georgia.
Market Potential

Port Led Economic Development

With these large scale industrial development in Gujarat and considering that the ports of Gujarat also serves the northern hinterland, a huge capacity expansion is required in Gujarat ports sector for enabling port led economic development.

As per Maritime Agenda 2020, Ministry of Shipping Projected traffic for 2019-20 in India port is 1280.1 MMT out of which 565 MMT will be handled by Ports of Gujarat.

Besides this it is also expected that capacity of Gujarat’s non-major port would reach 864 MMTPA by 2019-20.

Porbandar a Greenfield Port makes it a preferred Investment Destination

Porbandar district flourishes in mineral resource such as limestone, chalk, bauxite and building limestone.

Due to abundance of minerals, number of mineral based industries have been developed in and around the district.

The Kutch region of Gujarat is known to have Bauxite of good quality which has for the last six decades been set aside by the Government of Gujarat for an Alumina Refinery.

Major Mineral Handled at Porbandar Ports (MMTA)

Bauxite and Coal are the major contributor in terms of cargo handled by Porbandar port accounting 33% and 61% respectively.

Development of mechanized facilities for dry-bulk cargo, such as bauxite and coal, can generate additional revenue streams for Porbandari port.

Source: GMB
Growth Drivers

GoG Initiatives

Gujarat is one of the States in the country, where Govt. played a proactive role in the development of minor ports on its coastline. Gujarat is one of the first States in India to take up privatization. It also has large external trade potential, given its vast coastline.

Intermediate & Minor Port

Traffic at ports under GMB is 339.77 MMTPA & capacity of 466 MMT augmented during the year 2015-16*

Porbandar Port Trend

Currently Porbandar port handles coal, bauxite, limestone, cement, LPG etc. Out of total commodity, coal and bauxite accounts major cargo handled by the port. Due to absence of mechanization of port, it has an affect on total cargo handling.

Need for Mechanization

To meet the future market scenario for import and export of bulk cargo in Gujarat the ports should be mechanized for better efficiency in terms of Tonnes of cargo handling in the year and with improved safety and healthy environment.

Focus on to Meet the Future Needs

To comply on Gujarat Pollution Control Board (GPCB), the Gujarat Maritime Board has planned to mechanize its coal handling ports for an environment friendly, safe & secured cargo handling with improved efficiency and better output.

*Source: GMB
Gujarat - Competitive Advantage

State has the highest number of **Operation ports** and **commercial cargo ports**

Gujarat credited with India’s **First LNG** chemical port terminal at Hazira

**Ease of Doing Business:** Only state which comply 100% with Environmental procedures. Gujarat fares highly when it comes to setting up a business, allotment of land and obtaining a construction permit.

Gujarat ranked as **Best Performing State** as per NCAER State Investment Potential Index

Strategic location: Located on the west coast of India, Gujarat is well connected to the major cities of the world by air and sea routes.

Well connected to the major cities of the world by air and sea routes. The state has **45 operational ports**, **12 domestic airports** and **1 International airport** in addition to an extensive rail and road network.

Nearest maritime outlet to **Middle East, Africa and Europe**

Handled **40%** of national maritime trade in FY15

Gujarat is one of the leading Industrialized States in India and the State has attracted cumulative **FDI worth US$ 12 billion** from April 2000 to March 2015

**Flourishing Economy:** State contributes **7.2%** of the Nation’s GDP and shows leadership in many areas of manufacturing and infrastructure sectors. Gujarat’s **SDP (State Domestic Product)** at current price registered a growth of **11%** during the year 2014-15.

Source: Socio Economic review of Gujarat (2015-16)
Gujarat - Competitive Advantage

Robust Future Development of Ports in Gujarat

- **Port capacity enhancement:** Gujarat's non-major ports capacity is expected to reach 864MMTPA by FY20, which will be 52% of the total capacity enhancement at all non-major ports of India.

- **Development of port cities and port based SEZs:** Government of Gujarat (GoG) and GMB have planned to develop port cities and SEZs at Mundra and Pipavav.

- **Maritime cluster and university development** to promote positive synergies between participating entities (both port and non-port based), enhance competitiveness and grow the local maritime economy.

- **Shipbuilding parks:** Gujarat being hub for Shipbuilding in India and with the special incentives declared by GoI for Shipbuilding yards, many shipyards shall set their base in Gujarat.
Project Information

Porbandar port is located at 21°38'25"N and 69°37'24"E in the west coast of Saurashtra Peninsula in Porbandar district of Gujarat facing Arabian Sea. It covers an area of 930.52 ha.

Location

Porbandar port is located at 21°38'25"N and 69°37'24"E in the west coast of Saurashtra Peninsula in Porbandar district of Gujarat facing Arabian Sea. It covers an area of 930.52 ha.

Economic Profile-Porbandar

<table>
<thead>
<tr>
<th>No. of Industrial Estate</th>
<th>3</th>
<th>Major Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Industrial units</td>
<td>752*</td>
<td>Cement, Port based,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemicals, Minerals based,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Food &amp; Agro Industries</td>
</tr>
</tbody>
</table>

*Source: Ministry of MSME, District Industrial Potential Survey Report of Porbandar District (2016-17)
Project Information

- The hinterland of the port is extended in the Middle east, South east Asia and the state of Maharashtra
- Import of coal from Indonesia and China and its export to Maharashtra is the main traffic movement at the port
- The port also imports LPG from the Middle east mainly Saudi Arabia and Bahrain

Infrastructure Facilities

- **Harbour Structure-**
  - Draught: 9.5 meters
  - Channel length: 1.1 nautical miles (Anchorage to breakwater)
- **Navigational aids-**
  - Launches: 2
  - Tugs: 2
- **Berth/Jetty/Wharf-**
  - Jetty: 2
    - DWB (23m x 25 m)
    - Finger Jetty (101m x 60 m)
- **Cranes-**
  - 1 -TIL Models 1610 with 16 MT capacity
- **Storage-**
  - Transit Shed – 152.5m x 18m at jetty
    - 26.2m x 10m at old port
  - Covered Godowns -34
- **Dry Dock-**
  - 1(45.72m x 16.76m)
- **Dredger -**
  - 2 (CSD Ratnamani & CC 300)

*Source: GMB Website*
**Infrastructure Availability**

### Utility

**Water**
- Water supply for industry is provided by Gujarat Water Supply and Sewerage Board (GWSSB).

**Power**
- The power is supplied by GETCO to the entire Porbandar area.
- One power substation with an installed capacity of 66/11 KV is operational.

### Connectivity

**Rail**
- Directly connected with broad gauge railway line connected to Jetty.
- The port is about 5 km from the nearest Broad Gauge railway system of the country and is a terminating station.
- Porbandar Railway Station connects to major cities of Gujarat & major cities of India.

**Road**
- National Highway (NH-8E) is about 6 km away from the port.
- Porbandar is well connected with National and Coastal highway through two lane.
- The National Highway is 58 km connecting Porbandar with Rajkot, Ahmedabad, Mumbai etc.
- Porbandar is also well connected with different district of Gujarat via State Highway SH-17.

**Air**
- 400 kms away from International airport at Ahmedabad
- Nearest airport from the port is Porbandar airport which is about 8km
- Porbandar airport provides a well connectivity to Ahmedabad & Mumbai

**Existing Infrastructure**
- Existing jetty located on south western side of the coastal stretch of Porbandar
- It has a direct berthing facilities which can accommodate ships upto 50,000 DWT.
### Project Information

**Manpower requirement**

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floating crane Handler</td>
<td>2</td>
</tr>
<tr>
<td>Mobile Hopper Machine Handler</td>
<td>2</td>
</tr>
<tr>
<td>Conveyor belt surveyor</td>
<td>1</td>
</tr>
<tr>
<td>Stacker &amp; Reclaimer handling</td>
<td>2</td>
</tr>
<tr>
<td>On Shore supervisor</td>
<td>1</td>
</tr>
<tr>
<td>General Manager</td>
<td>1</td>
</tr>
<tr>
<td>Material handling</td>
<td>4</td>
</tr>
<tr>
<td>Executive supervisor</td>
<td>3</td>
</tr>
<tr>
<td>Clerical Staff</td>
<td>3</td>
</tr>
<tr>
<td>Other staff (Guard &amp; Peon)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

*Source: EY internal estimates*
Project Information

Project Structure & Implementation Models

- The mechanization project at Porbandar Port has been planned & shall be developed by Gujarat Maritime Board on a stand alone basis.

Possible Collaboration

<table>
<thead>
<tr>
<th>Key Technology / Machinery Suppliers / Material Handling System Suppliers</th>
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<tbody>
<tr>
<td>Murata Machinery Limited</td>
</tr>
<tr>
<td>Schaefer Holding International GmbH</td>
</tr>
<tr>
<td>Beumer Group GmbH</td>
</tr>
<tr>
<td>Elecon Engineering Company Limited</td>
</tr>
<tr>
<td>Aegis Eng. Co. Private Limited</td>
</tr>
<tr>
<td>Transflex Conveyors Private Limited</td>
</tr>
</tbody>
</table>

Port Operations and Management

<table>
<thead>
<tr>
<th>JSW Infrastructure</th>
<th>TM International Logistic Limited (TMILL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sical logistics limited</td>
<td>Essar Logistic Ltd (ELL)</td>
</tr>
<tr>
<td>PSTS Logistica Private Limited</td>
<td>Elecon EPC Projects Limited</td>
</tr>
<tr>
<td>Boxco Logistics India Private Limited</td>
<td>LD Ports and Logistics</td>
</tr>
</tbody>
</table>

Key Consideration

- Success of the project depends on prevailing market dynamics and International trade.
- Project execution depends on necessary approvals from regulators.
- The cost for the project is based on assumptions & benchmarking of similar project, subject to variation with change in any criteria.
- Port development depends on the existing type of industries, conducive environment for the investors, social infrastructure, etc.
The following cargo handling processes will be mechanized:

- Barge unloading
- Stacking
- Reclaiming and truck loading
- Reclaiming and wagon loading

### Technical details

#### Barge unloading: Mobile harbour cranes

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crane Type</td>
<td>Mobile Harbour Fixed Crane</td>
</tr>
<tr>
<td>Maximum Capacity</td>
<td>84 Ton</td>
</tr>
<tr>
<td>Maximum outreach</td>
<td>32 m</td>
</tr>
<tr>
<td>Capacity of unloading</td>
<td>853 TPH</td>
</tr>
<tr>
<td>Cycle time for operation</td>
<td>132 seconds</td>
</tr>
<tr>
<td>Turn over per day per crane</td>
<td>13,680 Tons</td>
</tr>
<tr>
<td>Hopper capacity</td>
<td>90 Tons</td>
</tr>
<tr>
<td>Pedestal height</td>
<td>6 m</td>
</tr>
<tr>
<td>Power requirement</td>
<td>670 KW</td>
</tr>
<tr>
<td>No. of cranes required</td>
<td>2</td>
</tr>
</tbody>
</table>

- Along with two mobile harbour cranes, ancillaries, such as closed belt conveyor with hopper, electrical MCC & control system, dust suppression system (fig canon) and fire fighting system will also be required.
- Other equipment required include two stacker-reclaimers, one each for truck loading and wagon loading, and storage space frame shed.
## Project Financials

### Project cost

The GMB has outlined a cost estimate of INR 102 crores for the mechanization of one jetty, below is a detailed break down of the equipment to be procured.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Total Estimated Cost (INR million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Harbour crane – Two (2) Nos</td>
<td>425.0</td>
</tr>
<tr>
<td>Stacker and reclaimers -2 Nos each including the belt conveyors</td>
<td>400.0</td>
</tr>
<tr>
<td>Space frame shed</td>
<td>130.0</td>
</tr>
<tr>
<td>Rapid wagon loading system – One (1) No.</td>
<td>30.0</td>
</tr>
<tr>
<td>Static Truck loading system including steel structure and bins – One (1) No.</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>INR ~1,025 million or ~102 crores</strong></td>
</tr>
</tbody>
</table>

Benchmark Financial data for a Similar Project

Mechanization and expansion of a solid cargo terminal at Dahej port

In 2014, Adani Petronet (Dahej) Port Private Ltd. (APPPL) proposed Phase III expansion involving mechanization of south berth and facilitating backup storage yards. Below is a broad level breakdown of the key cost components.

<table>
<thead>
<tr>
<th>APPPL mechanization and expansion cost estimates (INR million, 2014)</th>
<th>% of total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Works</td>
<td>1,247.5</td>
</tr>
<tr>
<td>Mechanical Handling System (Equipment)</td>
<td>2,170.2</td>
</tr>
<tr>
<td>Electrical &amp; IT Work</td>
<td>358.6</td>
</tr>
<tr>
<td>Utilities &amp; Others</td>
<td>245.6</td>
</tr>
<tr>
<td>Miscellaneous &amp; Contingency</td>
<td>621.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,643.2</strong></td>
</tr>
</tbody>
</table>

*Source: EY estimates based on GMB Estimates*
Approvals/ Clearances

### Approvals

<table>
<thead>
<tr>
<th>Approval Procedure</th>
<th>Approval from the Board Members of the Gujarat Maritime Board and approval from the Port &amp; Transport Department, Government of Gujarat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>License</td>
<td>License for implementation of Mechanized Handling System for handling and evacuating the cargo.</td>
</tr>
<tr>
<td>Power &amp; Water Connection</td>
<td>Additional power can be procured from the existing supplier – Paschim Gujarat Vij Company Ltd. (PGVCL). Similarly, water for can be procured from the Gujarat Water Supply and Sewerage Board.</td>
</tr>
<tr>
<td>Environmental Clearance</td>
<td>CRZ Clearance (Coastal Clearance) needs to be obtained from Gujarat Coastal Zone Management Authority (GCZMA). Additionally, pollution clearance from Gujarat Pollution Control Board (GPCB) is also required.</td>
</tr>
<tr>
<td>Performance Standard</td>
<td>Approval to be availed by forwarding a copy of the Performance Standards to the concerned users/ organization bodies</td>
</tr>
<tr>
<td>Tariff</td>
<td>Approval for the upfront tariff for mechanical handling of different cargoes</td>
</tr>
</tbody>
</table>

### Incentives

- GOI has allowed foreign direct investment of up to 100 per cent under the automatic route for projects related to construction and maintenance of ports and harbours;
- Permission granted for formation of joint ventures between Major Ports and foreign ports, Major Ports and Non-Major Ports, and Major Ports and companies;
- Various incentives, such as, ten year tax holiday for enterprises engaged in development of Port sector
- Tax holidays: The benefits of tax holidays as provided under Section 80 (I) (A) of the Income Tax Act for development, operation and maintenance of power plants, airports, ports, waste management facilities, water treatment plants, etc. is available to the developer.
- Reduced service tax incidence on coastal shipping
This project profile is based on preliminary study to facilitate prospective entrepreneurs to assess a prima facie scope. It is, however, advisable to get a detailed feasibility study prepared before taking a final investment decision.