



सत्यमेव जयते

GOVERNMENT OF GUJARAT

# Establishment of Phenol-Acetone Manufacturing Unit

## Chemicals and Petrochemicals

Government of Gujarat



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# Project Concept

## What is phenol?

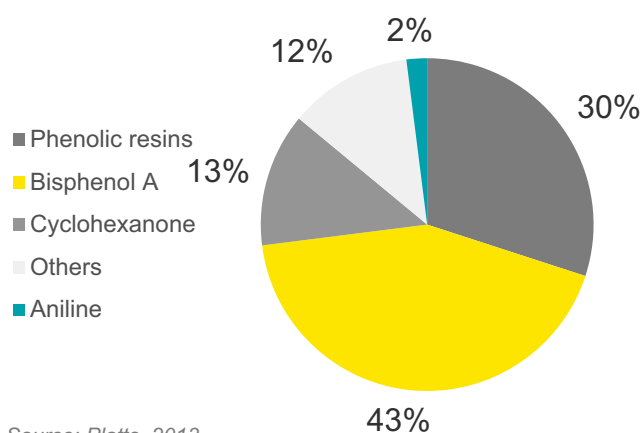
- ▶ Phenol, also referred to as Carboic acid or monohydroxy benzene, is a versatile industrial organic chemical.
- ▶ It is used to produce a wide variety of chemical intermediates, including bisphenol-A, phenolic resins, cyclohexanone and aniline.
- ▶ Major applications of phenol involves adhesives, agro chemicals, automotive, cleaning, coatings, construction, cosmetics and packaging.

## What is acetone?

- ▶ Acetone, also known as propanone, is a commercial solvent and raw material with wide usage in the chemical explosives and lacquer(thinner) industry.
- ▶ It is being increasingly used in the synthesis of chemicals such as diacetone alcohol, methyl methacrylate, pharmaceuticals and perfumes.
- ▶ Acetone is used as one of the volatile components of some paints and varnishes.

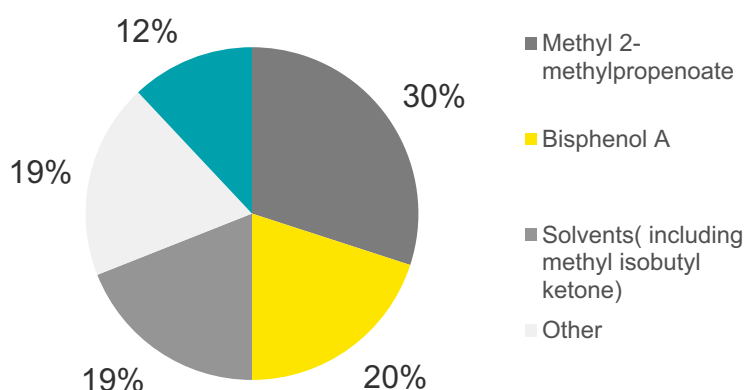
## Intermediates and end use

**Phenol intermediates**  
(% of phenol used)



Source: Platts, 2013

**Acetone intermediates**  
(% of acetone used)



Source: The essential chemical industry

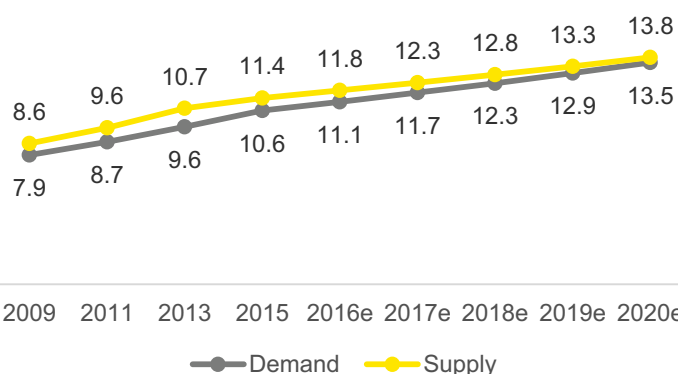
Intermediate	End use
Bisphenol A	Paints, coatings and mouldings
Caprolactam	Carpets, clothing, packaging
Aniline	Foam cushions, adhesives
Alkylphenols	Detergents
Methyl isobutyl ketone	Solvent for gums, paints



## Global phenol-acetone: demand-supply gap

- ▶ Demand for phenol and acetone is growing at a higher rate as compared to supply, which results in huge potential for new manufacturers to set up facilities globally.
- ▶ Acetone is a by product of phenol manufacturing process, as a result, stronger demand for phenol has resulted in oversupply of acetone.

**Global phenol demand and supply (million tons/year)**

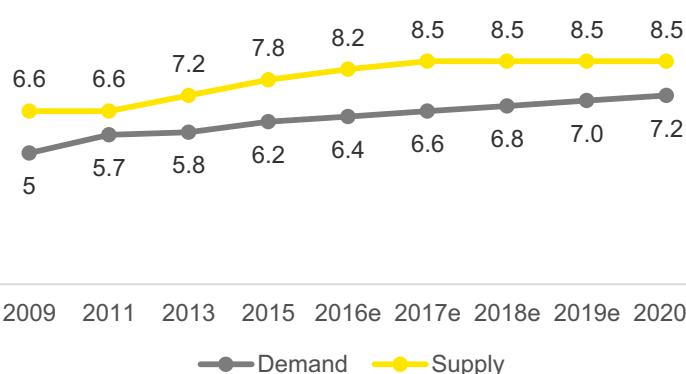


2009 2011 2013 2015 2016e 2017e 2018e 2019e 2020e

— Demand — Supply

Source: ICIS Market News, EY analysis

**Global acetone demand and supply (million tons/year)**



2009 2011 2013 2015 2016e 2017e 2018e 2019e 2020e

— Demand — Supply

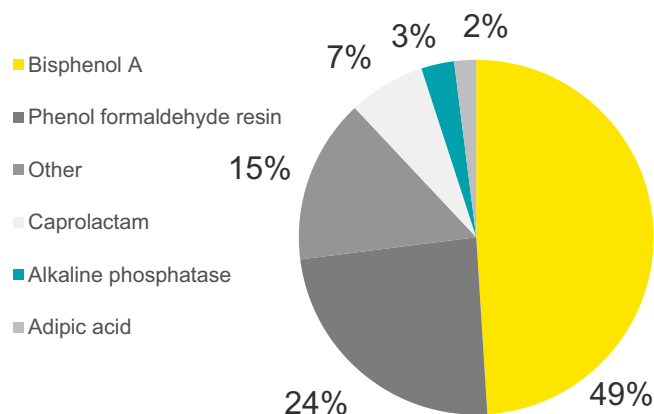
Source: International conference Indian petrochem, 2014

- ▶ Global phenol demand is growing at a Compounded Annual Growth Rate (CAGR) of 4.5%.
- ▶ Global phenol supply/production is growing at a CAGR of 4%.

- ▶ Global acetone demand is growing at a CAGR of 4.5%.
- ▶ Global acetone supply/production is growing at a CAGR of 4%.

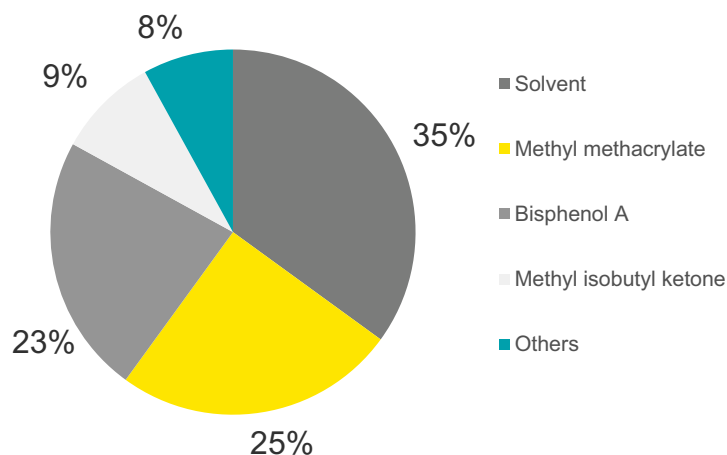
## Global phenol-acetone consumption

**Global phenol consumption by intermediate<sup>1</sup>**



Source: International conference Indian petrochem, 2014

**Global acetone consumption by intermediate**

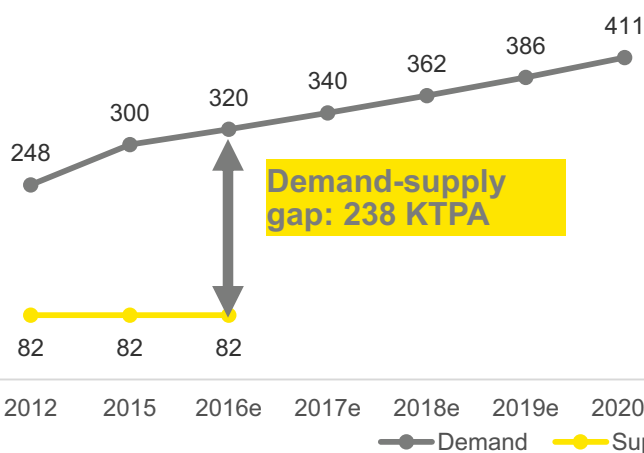


Note: <sup>1</sup> An intermediate is a molecular entity which is formed from the reactants and reacts further to give directly observed products of a chemical reaction.

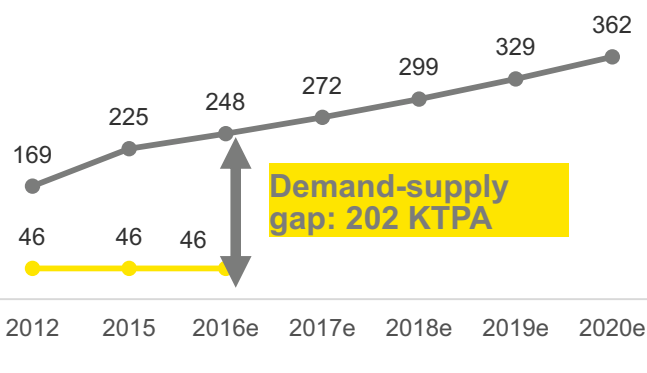
## Indian phenol-acetone market: demand-supply gap

- ▶ Indian phenol and acetone market has a huge supply demand gap of 238 KTPA and 202 KTPA respectively in 2016 due to absence of local manufacturers.
- ▶ Demand for phenol and acetone is estimated to reach 411KTPA and 362 KTPA respectively by 2020. There is a huge potential for local manufacturers to set up manufacturing facilities within the country in order to meet the growing demand.

**Indian phenol market demand-supply gap (Kilo Ton Per Annum(KTPA))**



**Indian acetone market demand-supply gap (Kilo Ton Per Annum(KTPA))**



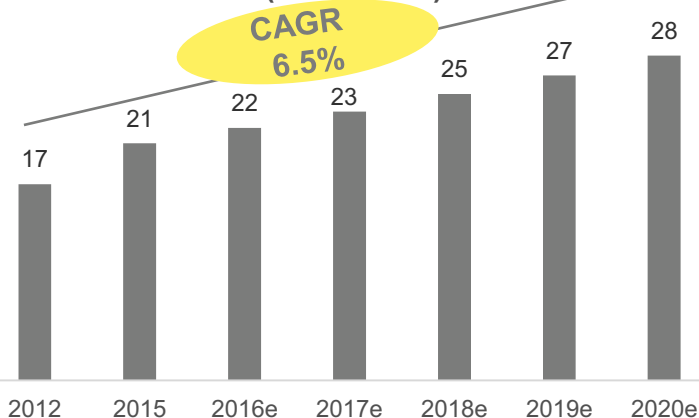
Source: ICIS, International conference Indian petrochem, 2014

Note: At present, SI group and HOCL are the only manufacturers of phenol and acetone in India. Supply forecast would depend on the set up of new phenol-acetone manufacturing facilities in the country.

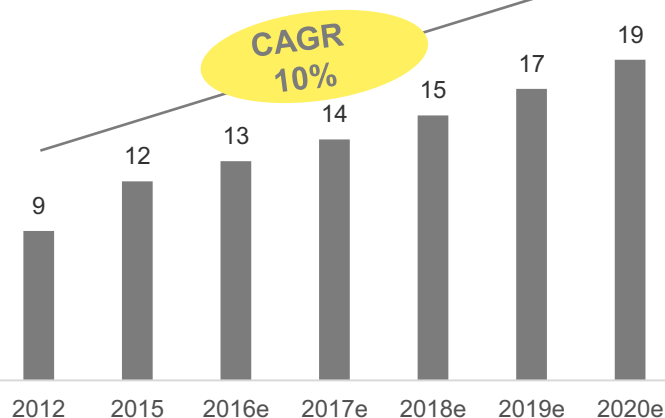
## Indian phenol-acetone market size and forecast

- ▶ Indian phenol market is expected to reach INR28 billion in 2020 from INR17 billion in 2012, growing at a CAGR of 6.5%.
- ▶ Indian acetone market is expected to reach INR19 billion in 2020 from INR9 billion in 2012, growing at a CAGR of 10%.

**Indian phenol market size (INR billion)**



**Indian acetone market size (INR billion)**



Source: ICIS, International conference Indian petrochem, 2014, EY analysis

## Increasing demand for Bisphenol A in India

- ▶ Bisphenol A (BPA) is the largest market for phenol and acetone.
- ▶ Demand for bisphenol A is driven by growth in electronics industry in India, which is anticipated to reach US\$400 billion in 2022 from US\$69.6 billion in 2012, growing at a CAGR of 24.4%.
- ▶ Global demand for BPA is expected to reach 9.6 MTPA in 2020 from 7 MTPA in 2013, growing at a CAGR of 4.7%.



## Growth in Indian water-based adhesive market



- ▶ Phenol and acetone intermediates are used as water-based adhesives in paints.
- ▶ As the government is restricting the use of Volatile Organic Compounds (VOCs), solvent-based coatings are being replaced by water based coatings.
- ▶ As a result, there is immense scope for phenol and acetone manufacturers to set up a plant in India in order to reduce import dependency in the paint industry.

## Growth in Indian crop protection market

- ▶ Indian crop protection market is expected to reach US\$6.8 billion in 2017 due to increased pressure on reduction of crop failure driven by growing food grain demand and declining farmlands.
- ▶ Phenol and acetone are key raw materials for manufacturing herbicides and pesticides for crop protection and yield improvement.



## Demand growth in Indian automobile sector



- ▶ Phenol is used as a key raw material in manufacture of nylon intermediates used in automobile carpeting.
- ▶ Acetone intermediate methyl methacrylate is used for auto glazing and as an exterior car coating for improving scratch and weather resistance in automobiles.
- ▶ These applications cater to the growing automobile industry need for light weight vehicles with higher fuel efficiency and performance. Indian automobile industry is expected to reach US\$300 billion in 2026 from US\$74 billion in 2015, growing at a CAGR of 15%.

# Gujarat Competitive Advantage



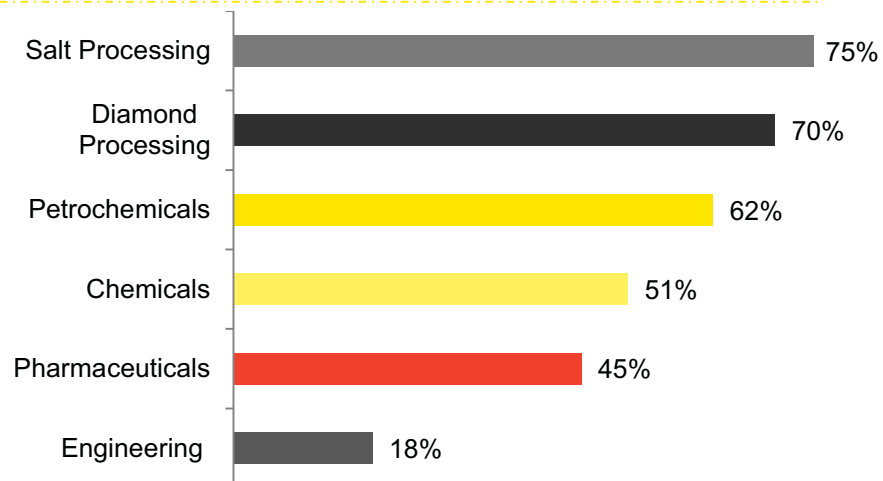
'Petro Capital' of India, contributing significantly to the country's production of **Petrochemicals (62%), Chemicals (53%) and pharmaceuticals (45%)**.



Gujarat has World's Largest grass root petroleum refinery at Jamnagar by Reliance Industries Limited with a crude processing capacity of **1.24 million Barrels Per Stream Day (BPSD)**

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

Geographical advantage due to location on the west coast of India 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.



**"Gujarat ranked first in ease of doing business as per DIPP report 2015"**

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

**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

**Flourishing Economy:** State contributes **7.2%** of the Nation 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.

**Key Industries:** Gujarat is the leader in key industrial sectors such as chemical, petrochemical, auto and its allied sector, pharmaceuticals, engineering, textile, jewellery etc.

**Strategic location and excellent infrastructure:** Located on the west coast of India, Gujarat is well connected to the major cities of the world by air and sea routes. The state has 45 ports, 12 domestic airports and 1 international airport in addition to an extensive rail and road network

\*Source: Socio Economic Review of Gujarat 2015-16

# Gujarat Competitive Advantage

- ▶ **38%** (564 km) of the 1500 km length of DFC will pass through Gujarat which includes 62% of total area of Gujarat (18 out of 33 districts within the influence area)
- ▶ Investment potential for Gujarat is **US\$ 50 bn** (60% of total investment potential in DMIC)

- ▶ Presence of over **1100 manufacturing unit** comprising of small and large industries in PCPIR including chemical, petrochemical, engineering, plastic, dyes & pigments, textile etc.

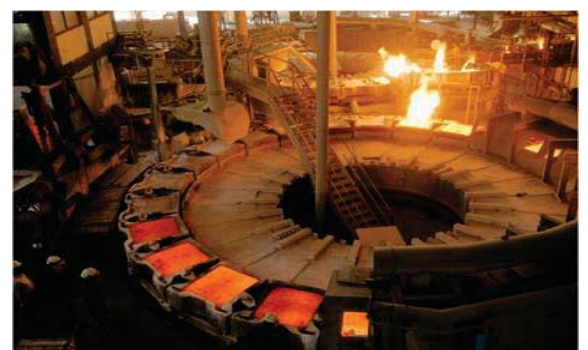
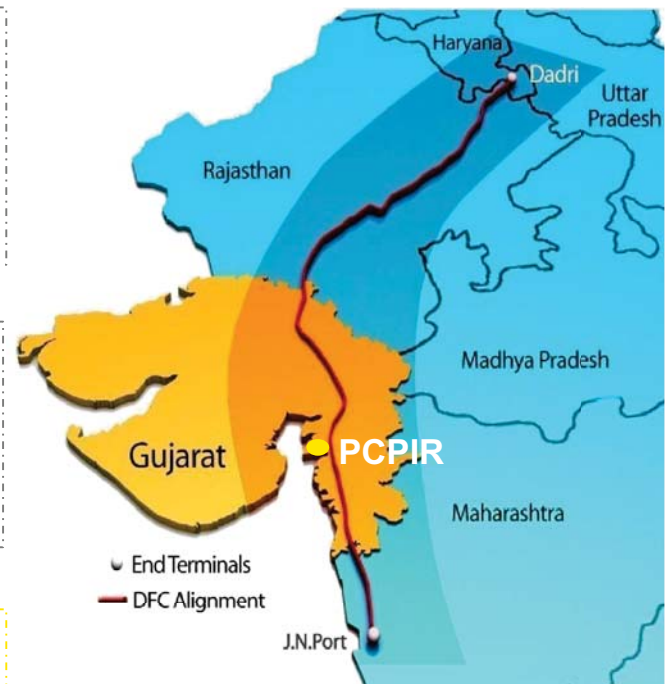
- ▶ The State has received acknowledgments of **2,466 Industrial Entrepreneurs Memorandum** (IEM) filed by entrepreneurs between 2010 and October 2015 with an estimated investment of **Rs. 6,01,766 Crores**

- ▶ Gujarat, with **42.6 %** of its population residing in the urban areas, is among the top three urbanized states in the country

- ▶ Gujarat contributes around **17.2 %** to the country's industrial output whereas the value of output registered is about **18.5%**.

- ▶ Gujarat is the one of the power surplus states in the country as a result it helping in bringing huge amount of investment from the industries and tagged as preferred investment destination in the country

- ▶ Gujarat contributes around 19.1 per cent to India's total exports of goods in 2014-15.



\*Source: Socio Economic Review of Gujarat 2015-16

\*Source: DIPP report



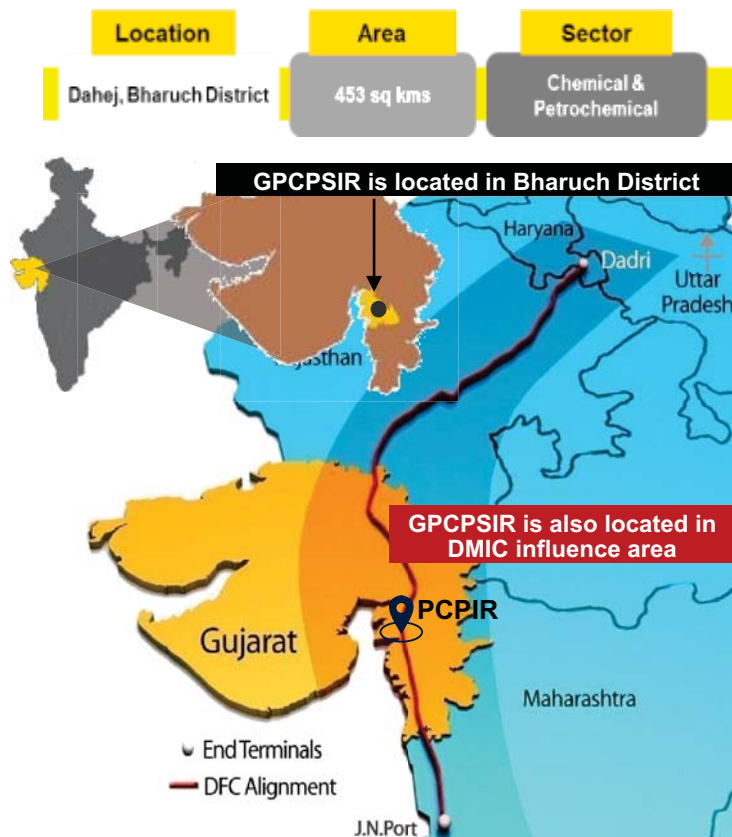
# Project Information

## Location/Size

### Gujarat PCPIR

Gujarat PCPIR<sup>1</sup> (GPCPSIR) is a specially delineated Investment Region planned for establishment of domestic and export led production facilities for Petroleum, Chemicals And Petrochemicals. The PCPIR is located in South Gujarat and has Gulf of Khambhat to its West, Narmada river & Aliyabet island in the South, villages of Vagra and Bharuch in the East and Bharuch-Dahej railway line in the North.

GPCPSIR also falls in the Delhi Mumbai Industrial Corridor (DMIC) influence area.



Investment Made till date (at historical cost) Over 100 Functional Units

**INR 63,651 crores**  
(USD 9.5 billion)\*

Investment Committed

**INR 1,05,989 crores**  
(USD 15.8 billion)\*

Investment on Infrastructure Development

**INR 15,660 crores**  
(USD 2.3 billion)\*

### Chemical port and storage terminal, Dahej PCPIR (one of existing units in PCPIR, Dahej)

- ▶ The terminal port is operated by GCPTCL
- ▶ Storage terminal total project cost is INR 830 crore (US\$ 186 million)
- ▶ The terminal has a facility to store over 3.5 lakhs cubic meters of liquid chemicals
- ▶ Port has the annual handling capacity of about 2.5 MMTPA

Existing Tank: 35 Nos.  
Type of storage: Fixed roof/Floating roof/Fixed cum Internal floating roof/Double walled storage tank/

PCPIR – Petroleum, Chemicals & Petro Chemical Investment Region

GPCPSIR – Gujarat Petroleum, Chemical & Petro Chemical Special Investment Region

Source: GIDC & DMICDC

## Infrastructure Availability

### Logistics & Connectivity



#### Existing

- ▶ Connected to Delhi-Mumbai Broad Gauge railway line at Bharuch
- ▶ Bharuch –Dahej rail line (62 km)

#### Proposed

- ▶ Delhi-Mumbai Dedicated Freight Corridor (DFC) will touch the PCPIR on the eastern side
- ▶ Bharuch –Dahej broad gauge line to be connected to the DFC at Dayadra Jn. (~50 kms)



#### Existing

- ▶ Adani Port (Dahej) - 11.7 MMTPA
- ▶ GCPTCL Liquid Chemical Terminal - 1.8 MMTPA
- ▶ LNG Petronet (Gas Terminal) - 12.5 MMTPA
- ▶ Reliance liquid fuel jetty - 2.12 MMTPA
- ▶ Birla Copper bulk cargo jetty - 3.8 MMTPA

#### New Development

- ▶ Development of jetty for handling ODC (Over Dimensional cargo) in Joint Venture with Dahej SEZ Ltd



#### Existing

- ▶ 250 km from International Airport at Ahmedabad
- ▶ 90 km from Domestic Airport at Vadodara
- ▶ 85 km from Domestic Airport at Surat

#### Proposed

- ▶ Greenfield Airport for PCPIR



#### Existing

- ▶ 50 Km of six lane Dahej-Bharuch State Highway connecting six lane Delhi- Mumbai National Highway and National Expressway

#### Proposed

- ▶ Ahmedabad Vadodara National Expressway to be extended to Mumbai

### Utilities



#### Existing

- ▶ GIDC supplies 50 MGD raw water drawn from Narmada river at Nand and Angareshwar ( 25 MGD each)

#### New Developments

- ▶ Water supply scheme for 50 MGD water from Miyagam Branch Canal (130 km)



#### Existing

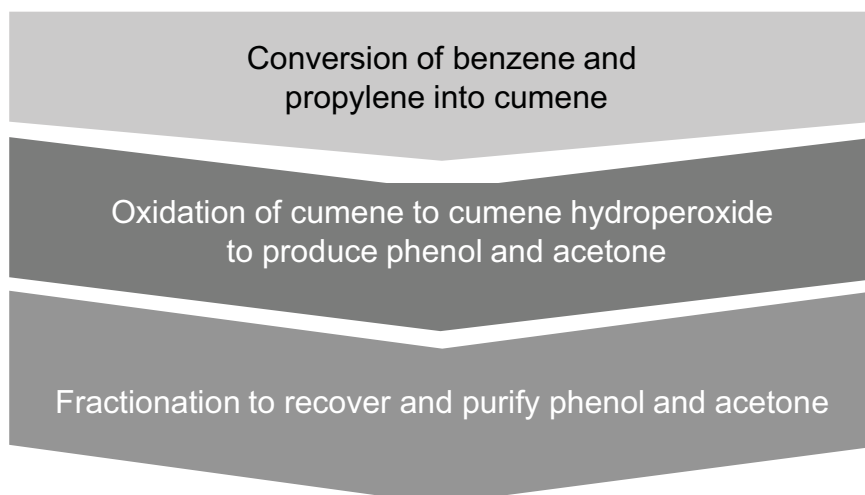
- ▶ Three 220 KV sub-stations located at Dahej & Vilayat & Six 66 KV substations located at Dahej, Luna, Bhensali & Vilayat

#### New Development (in progress)

- ▶ One 440KV, one 220KV & nine 66KV substations proposed within PCPIR area
- ▶ Gujarat Energy Transmission Corporation Limited (GETCO) of 220 KV substation at Suva Dahej,
- ▶ 1600 MW gas based power plant by Torrent Power Ltd. in Dahej SEZ. Operational - 400 MW (1<sup>st</sup> Phase)
- ▶ 2640 MW coal based power plant - Adani Power

## Phenol-acetone manufacturing

- ▶ Phenol manufacturing process involves reaction of benzene and propylene in order to form cumene, which is then converted to phenol.
- ▶ Acetone is a by product of the manufacturing process.



Source: Haldia Petrochemicals Ltd

## Feedstock requirement and sourcing

Feedstock	Quantity required for producing 100KTPA Phenol (KTPA)
Benzene	87
Propylene	47
Hydrogen	0.1

Source: Haldia Petrochemicals Ltd

- ▶ Feedstock can be sourced from various local manufacturers.
- ▶ Remaining feedstock requirement can be fulfilled by imports from China, US or western Europe.

Local Manufacturers	Benzene supply (KTPA)	Propylene supply (KTPA)
Reliance	720	2,728
Indian Oil Corporation Ltd (IOCL)	125	565
Haldia Petrochem	132	345
Bharat Petroleum Corporation Ltd (BPCL)	43	230

Source: Mitsubishi Chemical Holdings, 2014, company websites

Note: The list of local manufacturers is not exhaustive

# Project Information

## Utility requirements

Utility	Unit of measure	Hourly consumption	Consumption per ton of Phenol
High Pressure (HP) steam	T	35.75	1.43
Medium Pressure (MP) steam	T	24	0.96
Low Pressure (LP) steam	T	15.5	0.62
Power	KWh	4550	182
Cooling water	m <sup>3</sup>	7550	302

Source: Haldia Petrochemicals Ltd

## Key Players

### Indian Players



### Global Players



### Phenol-Acetone Technology Providers



## Manpower Requirement<sup>1</sup>

- ▶ Approximately 300-400 skilled manpower would be required for 100KTPA of phenol with a by product of 60 KTPA acetone.

## Potential collaboration opportunities

- ▶ Indian phenol-acetone manufacturers can collaborate with global manufacturers in order to take advantage of their technology and expertise.
- ▶ Potential collaborations can be made with global players like Kellogg Brown & Root Inc., ILLA INTERNATIONAL LLC and Honeywell UOP.

## Key Considerations

- ▶ **Market driven prices:** The prices of petrochemicals are determined on the basis of South East Asia (SEA) prices in addition to import duties. Due to relatively free imports and end prices being market driven, domestic manufacturers have to price their products in line with the prices prevailing in SEA region, irrespective of costs of production. This leads to different margins for producers having different feedstocks.
- ▶ **High investment:** The petrochemical industry is capital-intensive by nature majorly due to high feedstock import cost and dependence on western countries for technology.
- ▶ **Phenol health hazard:** Phenol is highly irritating to the skin, eyes, and mucous membranes in humans after acute short-term inhalation or exposures. These adverse effects might hinder phenol market growth.

#### Sources:

[http://technomanage.com/Process%20Technology%20Database/Petrochemicals/Phenol/Phenol\\_licensor.htm](http://technomanage.com/Process%20Technology%20Database/Petrochemicals/Phenol/Phenol_licensor.htm)  
<https://www.equitymaster.com/research-it/sector-info/petrochem/Petrochemicals-Sector-Analysis-Report.asp>  
[http://www.icrier.org/pdf/working\\_paper\\_271.pdf](http://www.icrier.org/pdf/working_paper_271.pdf)  
[http://www.researchandmarkets.com/reports/1878608/petrochemicals\\_industry\\_in\\_india](http://www.researchandmarkets.com/reports/1878608/petrochemicals_industry_in_india)  
<http://timesofindia.indiatimes.com/city/kochi/Rs-6000-crore-catalyst-for-Kerala-industry/articleshow/14856327.cms>  
<https://www3.epa.gov/airtoxics/hlthef/phenol.html>

Note: <sup>1</sup>Manpower requirement is indicative of a comparable project and may vary by individual project

# Project Financials



## Project cost

The total project cost of setting up a phenol-acetone manufacturing facility at Dahej will be ~**INR600 crores** for a production capacity of 100 Kilo Ton Per Annum (KTPA) Phenol with 60 KTPA Acetone as a by-product.

Project specifications	INR crore
Land : Area: 5,500 square meters Rate: INR1,440 per sq. meter. as of 1 January 2016 <sup>1</sup>	0.8
Building (plant area, office, store, factory shed, lab and packaging, open space) Built-up area: 2,750 sq. metres. Average rate: INR11,200 per sq. metre.	3.08
Machinery, working capital and other miscellaneous expenses	596.1
<b>Total cost</b>	<b>600</b>

## Payback period

Capacity (TPA)	Acetone* (by product)						
	Phenol	Acetone*					
	1,00,000	60,000					
Average capacity utilization in industry (%)	80						
Production (TPA)	128000						
Average price per unit (AR) (INR / ton) <sup>2</sup>	62310						
Industrial average EBITDA margin	13.78%						
Forecasting revenues at expected industrial growth rate <sup>3</sup>	7.80%						
Time (years)	1	2	3	4	5	6	7
Revenue (INR crore)	798	860	927	999	1077	1161	1252
EBITDA (@13.78% of rev.) <sup>4</sup>	110	118	128	138	148	160	172
Undiscounted cumulative cash flows (INR crore)	110	228	356	494	642	802	975
Investment (INR crore)	600						

**Estimated payback period: 4.8 years**

<sup>1</sup>Land rate based on Dahej(rate may vary depending on the location of the site in Dahej PCPIR).

<sup>2</sup>Average price per unit is considered by taking average of phenol and acetone import price in India.

<sup>3</sup>Industrial growth rate of 7.8% is considered taking into consideration the average potential growth of phenol-acetone industry in India.

<sup>4</sup>EBITDA margin of FY11 HOCL is taken for calculation

\*Acetone is produced as a by product in phenol manufacturing process.

Note: The estimated project financials have been calculated based on the capital requirement/investment of a typical phenol-acetone manufacturing unit. However, they may vary by individual project.

# Project Financials



## Means of finance

<b>Estimated industrial average (Debt/equity)</b>	<b>0.45x</b>
Debt raised (INR crore)	186
Equity invested (INR crore)	414
Estimated debt raised (INR crore): 186	

## Minimum viable size

EBIT margin <sup>1</sup>	10.2%
Total operating costs (as% of revenues)	89.8%
Total costs (89.8% @ 798) (INR crores)	716.1
Depreciation cost <sup>2</sup> (3.7% of PPE cost) crores	13.2
Manpower cost (50% of employee cost)	
Employee cost (15% of total cost) <sup>3</sup>	53.7
Finance cost (16% of debt)	29.8
Others (including insurance and miscellaneous) (2% of total investment)	12
Total fixed cost (FC) (INR crore)	108.7
Variable cost (VC= TC-FC) (INR crore)	607.3
Variable cost/Unit (INR crore)	0.008
Average revenue/unit (INR crore)	0.009
Minimum viable size (FC/(AR-VC)) (units)	45,723
Estimated minimum viable size: 45 KTPA (Phenol)	

## Such a plant will also produce 27 KTPA<sup>4</sup> of acetone as a by product

<sup>1</sup>EBIT margin of FY11 HOCL is taken for calculation.

<sup>2</sup>Depreciation cost= %Depreciation of machinery \* machinery cost  
Industry average is used for depreciation% for estimation purposes

Machinery cost is considered to be 60% of Machinery, raw materials, component import and other miscellaneous expenses as it is the major cost is attributed to import of electronic components.

<sup>3</sup>Manpower cost=50% of employee cost; Employee cost=15% of total cost (50% of total employee cost is assumed to be fixed, while rest is considered under variable cost.

<sup>4</sup>Acetone is a by product in phenol manufacturing process, accounting to 60% of phenol produced.

Note: 1. Revenue from sale of both phenol and acetone is considered for payback period and minimum viable size calculation.

2. Exchange rate of 67.5 is used to convert US\$ to INR

3. The estimated project financials have been calculated based on the capital requirement/investment of a comparable phenol-acetone manufacturing unit. However, they may vary by individual project.

# Approvals and incentives



## Clearances/approval required

Approvals/clearance required	Department to be approached and consulted
Incorporation of company	Registrar of companies
Registration/Industrial license	“Secretariat of industrial assistance” (SIA) for large and medium scale industries
Allotment of land	State industrial development corporation
No objection certificate (NOC) under air and water pollution control acts	State pollution control board
Approval of construction and country planning	<ul style="list-style-type: none"> <li>▶ Town and country planning</li> <li>▶ Municipal and local authorities</li> <li>▶ Chief inspector of factories</li> <li>▶ Pollution control board</li> <li>▶ Electricity board</li> </ul>
Finance	For loans higher than INR 1.5 crore (~US\$ 0.22 million <sup>1</sup> ), all India financial institutions like Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India (ICICI), Industrial Finance Corporation of India (IFCI) etc.
Registration under state sales tax act and Central and State excise act	<ul style="list-style-type: none"> <li>▶ Sales tax department</li> <li>▶ Central and state excise department</li> </ul>
Code number for export and import	Regional office of director general of foreign trade
Environmental clearance	Ministry of environment, forest and climate change after conducting environment impact assessment (EIA) for any project
Hazardous waste import and export approval	Ministry of environment, forest and climate change
Exiting business	Ministry of corporate affairs

Government of Gujarat (GoG) has introduced single window facilitation portal for investors providing undermentioned benefits:

- ▶ Centralized system to monitor applications
- ▶ User friendly and simplified application process for investors
- ▶ System for authorities and investors to check the status of applications
- ▶ Increased departmental ownership

Source:

1. “Gujarat Textile Policy”, Industries and Mines Department, Government of Gujarat, 5 September 2012
2. Approvals required for setting up plant, [http://dipp.nic.in/English/Investor/Investors\\_Guidelines/approval\\_clearances\\_required\\_for\\_new\\_projects.pdf](http://dipp.nic.in/English/Investor/Investors_Guidelines/approval_clearances_required_for_new_projects.pdf), accessed 8 July 2016
3. “Environment clearance” <http://envfor.nic.in/major-initiatives/environmental-clearances>, accessed 8 July 2016
4. “Gujarat single window clearance, <https://www.ifpgujarat.gov.in/portal/jsp/aboutUs.jsp>, accessed 8 July 2016
5. “Exiting business, <http://www.mca.gov.in/MinistryV2/CloseCompany.html>, accessed 9 July 2016



## Incentives from Government of Gujarat

As per the Gujarat Industrial Policy 2015, following are the key incentives provided to the manufacturing sector:

- ▶ Capital investment subsidy of 10% loan amount disbursed by Bank/Financial Institution up to a maximum amount of INR1.5 million (~US\$ 22,500<sup>1</sup>) in municipal corporations areas.
- ▶ Assistance for technology acquisition from recognized institution for manufacturing products will be provided by way of 50% of the cost payable subject to a maximum of INR 5 million (~US\$ 75,000<sup>1</sup>), including royalty payment for first two year.
- ▶ Assistance for venture capital to raise promoter contribution in the form of equity or loan through Gujarat Venture Finance Limited (GVFL).
- ▶ Interest subsidy scheme: 50 lakh interest subsidy for large scale industrial units.
- ▶ Assistance scheme for Centre of Excellence: For national level centre of excellence the amount of assistance will be up to INR20 crore (~US\$ 30 million<sup>1</sup>) while for international level centre of excellence the limit will be INR30 crore. Such centre of excellence must encourage for innovation and entrepreneurship. 70% assistance including recurring expenditure would be availed.

## Incentives from Government of India

### Sector policy under Make in India initiative

- ▶ Industrial licensing has been abolished for most sub-sectors except for certain hazardous chemicals.
- ▶ A weighted tax deduction of 200% under Section 35 (2AB) of the Income Tax Act for both capital and revenue expenditure incurred on scientific research and development. Expenditure on land and buildings are not eligible for deductions.
- ▶ In the export sector, India has entered into a number of free trade agreements with ASEAN, Japan, Korea, Malaysia, Singapore, and others.

### Technology development

- ▶ SMEs will be given access to the patent pool and/or part of reimbursement of technology acquisition costs up to a maximum of INR2 million (~US\$30,000<sup>1</sup>) for the purpose of acquiring appropriate technologies up to a maximum of five years.

### Green technology & practices:

- ▶ 5% interest in reimbursement & 10% capital subsidy for the production of equipment/machines/devices for controlling pollution, reducing energy consumption and water conservation.
- ▶ A grant of 25% to SMEs for expenditure incurred on audit subject to a maximum of INR1,00,000 (~US\$1,500<sup>1</sup>).
- ▶ A 10% one-time capital subsidy for units practising zero water discharge.
- ▶ A rebate on water cess for setting up wastewater recycling facilities.
- ▶ Incentives for renewable energy under the existing schemes.

Source:

1. "Exiting business, <http://www.mca.gov.in/MinistryV2/CloseCompany.html>, accessed 9 July 2016
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3. Industries Commissionerate website, [http://ic.gujarat.gov.in/?page\\_id=3175](http://ic.gujarat.gov.in/?page_id=3175), accessed on 1 June 2016
4. "Textile industry welcomes amended TUFs", Business Standard, 2 January 2016
5. "Approvals" [http://dipp.nic.in/English/Investor/Investers\\_Gudlines/FAQ\\_GrantIndustrialLicence.pdf](http://dipp.nic.in/English/Investor/Investers_Gudlines/FAQ_GrantIndustrialLicence.pdf), accessed 27 June 2016
6. "List of defence equipment requiring industrial license", [http://dipp.nic.in/English/acts\\_rules/Press\\_Notes/pn3\\_2014.pdf](http://dipp.nic.in/English/acts_rules/Press_Notes/pn3_2014.pdf)

**Energy and Petro Chemicals Department**

[www.guj-epd.gov.in](http://www.guj-epd.gov.in)

**Gujarat Narmada Valley Fertilizers & Chemicals Limited**

[www.gnfc.in](http://www.gnfc.in)

**Industries & Mines Department**

[www.imd-gujarat.gov.in](http://www.imd-gujarat.gov.in)

**Gujarat Industrial Development Corporation**

[www.gidc.gov.in](http://www.gidc.gov.in)

**Office of Industries Commissioner**

[www.ic.gujarat.gov.in](http://www.ic.gujarat.gov.in)

**Industrial Extension Bureau**

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

*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.*

For further details:

**iNDEXTb**  
INDUSTRIAL EXTENSION BUREAU  
(A GOVT. OF GUJARAT ORGANISATION)  
ISO 9001 : 2015 Certified

- Block No. 18, 2nd Floor, Udyog Bhavan, GH-4, Sector 11, Gandhinagar - 382 010 Gujarat, INDIA
- +91-79-23256009, 23250492 / 93
- +91-79-23250490
- indextb@indextb.com
- www.indextb.com



**Gujarat Narmada Valley  
Fertilizers & Chemicals Limited**

Gujarat Narmada Valley Fertilizers & Chemicals Limited  
P.O. Narmadanagar - 392015, Dist. Bharuch, Gujarat.  
Phone : +91 – 2642 – 202279 Fax : +91 – 2642 – 247063  
Email: [rgrehani@gnfc.in](mailto:rgrehani@gnfc.in) ; [industrialproducts@gnfc.in](mailto:industrialproducts@gnfc.in)  
<http://www.gnfc.in>