

Environmental Challenges in Gujarat – Chemical Industry

Tata Chemicals Limited

Gujarat – Economic Profile



Population	60 million (5%)
Area	196,000 sq. km. (6%)
Fixed Capital Investment	US\$ 17.9 billion (18.5%)
Industrial Production	US\$ 39.72 billion (16.2%)
Exports	(14%)
<i>(Source: Annual Survey of Industry Govt. of India 2008-09)</i>	<i>Figures in brackets show % share of India</i>

With 5% of India's population, Gujarat has 16% of industrial production. Gujarat had an annual average growth of 9% in the last 3 years and an average industrial growth of 15%.



Gujarat's Share of Industrial production volume in India

Refined Petroleum Products	50%	Salt	70%
Drugs & Pharmaceuticals	45%	Groundnut	35%
Chemicals & Allied Products	31%	Cotton	18%
Soda Ash	98%	Castor Seeds	70% (45% of world)
Caustic Soda	35%		
Polyester Filament Yarn	45%		
Textiles	15%		
Sponge Iron (HBI)	35%		
Fertilizers	30%		
Cement	9%		

8 out of every 10 diamonds in the world are processed in Gujarat

Key enablers for industry



- ④ **Investment:** In the last five years, Gujarat has attracted highest investment among all states in India worth INR 1,82,998 crore.
- ④ **Manufacturing:** At present, Gujarat has a production share of over 50 % in petroleum products and 31 % in chemicals and 45 % pharma industry in India. This leads to good synergies.
- ④ **Infrastructure:** The State offers great road/rail/air connectivity and reliable power supply to its consumers. Moreover, the State has easy accessibility to the western, middle-eastern and African markets through 41 ports.
- ④ **Government and people:** are very friendly to the Industry:

Key Environmental Challenges

- Stringent Norms
- New Legislation
- Resource availability
- Technology adoption
- Climate Change concerns
- Green Manufacturing
- Energy Conservation
- Water availability
- Waste disposal
- Sustainability



Stringent Norms & New Legislation



- Many new Environmental laws are applicable to industrial development.
- Single window arrangement for such clearances – Central and State agencies are involved are desirable for speedy implementation
- The long coastline of Gujarat is ideal for industrial development but the CRZ rules are likely to cause procedural delays.
- Trend of tightening sector specific environmental norms
- Requirements of technology availability and expensive retrofits



Resource Availability

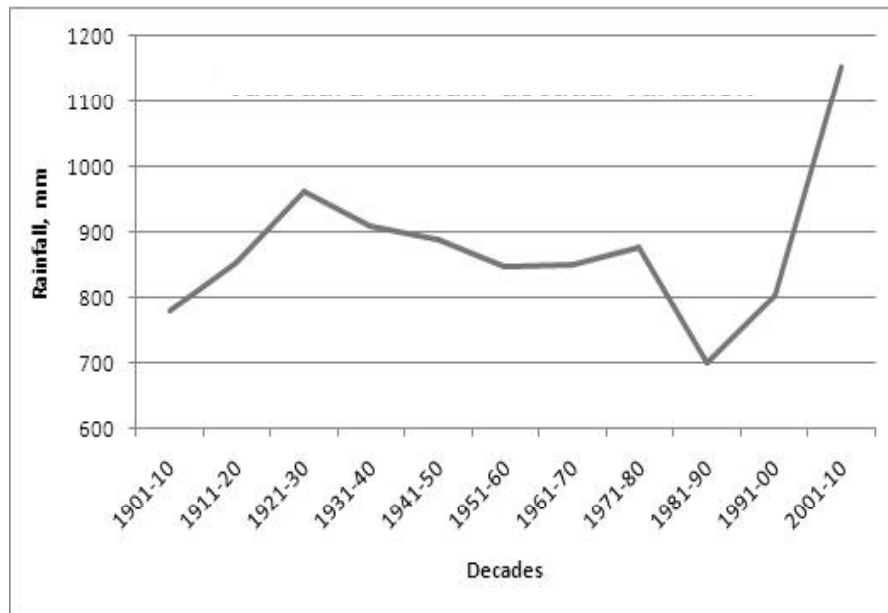
- Rich mineral deposits are our state's extremely valuable possessions but many of these are located within or in the vicinity of protected areas (22 sanctuaries, 4 parks and Eco Sensitive Zones) where many industrial activities are prohibited
- Government and Industry to partner for sustainable exploration of minerals

Climate Change



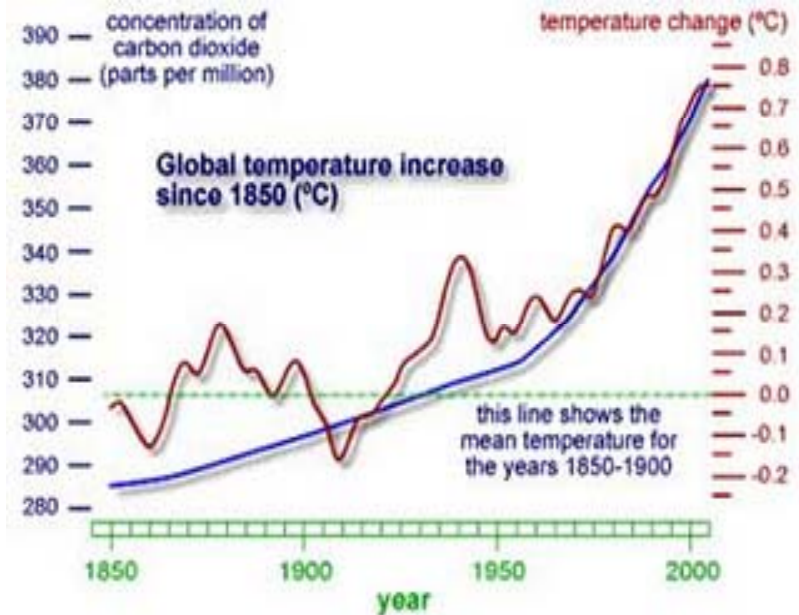
• Precipitation

- The increased frequency of heavy rainfall in south Gujarat, Saurashtra and Kutch and lengthening of the monsoon season has been observed in the past 10 years leading to decrease in Production of materials such as Salt... which relies on low rainfall and short seasons



• Higher temperatures

- Causes soils moisture loss and higher evaporation from reservoirs.
- Scientists agree that warmer temperatures would cause rise in sea levels. More severe storms and disturbed crop patterns



Green Manufacturing



Manufacturing that uses, support and sustain a sustainable way of delivering products and services that do no harm to the environment.

Reduce, Reuse, Recycle, Recover

Energy Conservation

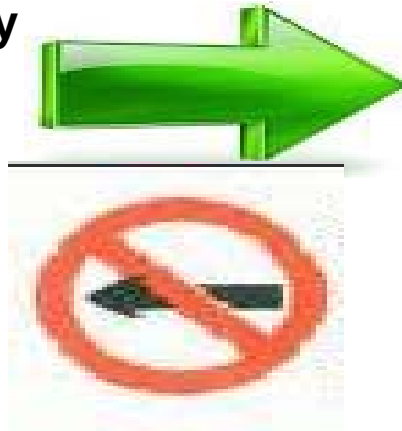
- Gujarat imports fuels- securitization and logistics issues
- Availability of advanced technologies
- Making retrofits financially viable
- Energy efficient plants need to be incentivized- faster approvals, favorable taxes etc
- CII mission on Sustainable Growth calls for 20% reduction in CO2 intensity by 2020



Energy Conservation

➤ Conventional Energy

- Diesel
- Petrol
- Furnace Oil
- Natural Gas
- Coal & Coke



➤ Non Conventional Energy

- Wind
- Hydropower
- Solar
- Tidal
- Alternate Fuel (Hydrogen)

- Solar Power Policy - 2009
- Wind Power Policy – 2007
- Involvement of Next Generation in sensitization (Bal Urja Rakshak Dal)
- Energy efficient practices, devices, and building designs.

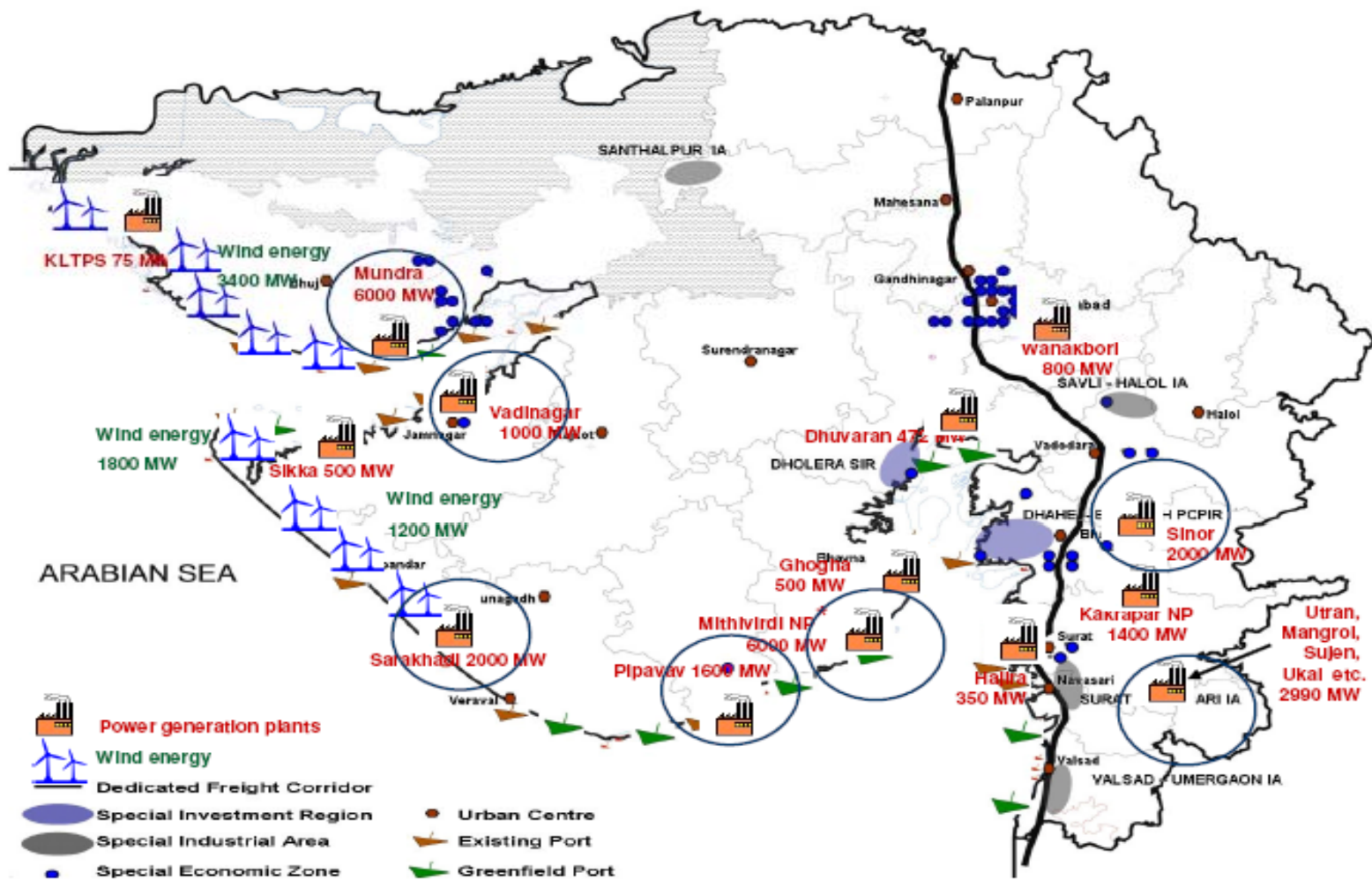


Gujarat – Renewable Energy Potential



- ✓ Gujarat is rich in renewable energy resources – 300 days of sunshine, Rann of Kutch where the land is endless and the sun's heat relentless, good winds along its 1600 km long shoreline, scope for energy plantation in its vast wastelands, waste to energy options that harness bio, agro and industrial-waste.
 - ✓ Solar, Wind, Biomass and Tidal power potential 10,000 MW, 7,000 MW, 9,000 MW, 18,000, MW respectively.
 - ✓ Gujarat is already among the top four states using renewable energy, having an installed capacity of about 1,400 MW.
 - ✓ In this scenario, it is certainly in our economic self-interest to employ renewable energy technologies.
 - ✓ Gujarat has over Rs 80,000 crores investment planned in solar energy and wind energy which would be the highest in the country
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Renewable Non Renewable Energy Map - Gujarat



Water



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- Rising Insecurity and fierce competition for scarce water – between - Agriculture (Livelihood connect), industry and human needs
 - Social : Agriculture is mainstay of Economy, 71% of all fresh water is used in agriculture
 - Resource : Ground water progressively depleting (long term decline as high as 3m/Yr), increasing salinity, deepening wells, higher energy usage (>5 times the National Average) **More than 50 % Districts are in Grey / Dark / Over Exploited Zones for Ground Water.**
 - Economic : Cost of water is so low that it encourages inefficient use
 - Industry – under increasing pressure to be self reliant

Waste



• Industrial Waste

- Management of hazardous waste
- Space constraints for Landfill sites.
- Low expertise on recycle & reuse at Industrial materials.
- Increasing legislations (on Waste)
- Costly Technology.

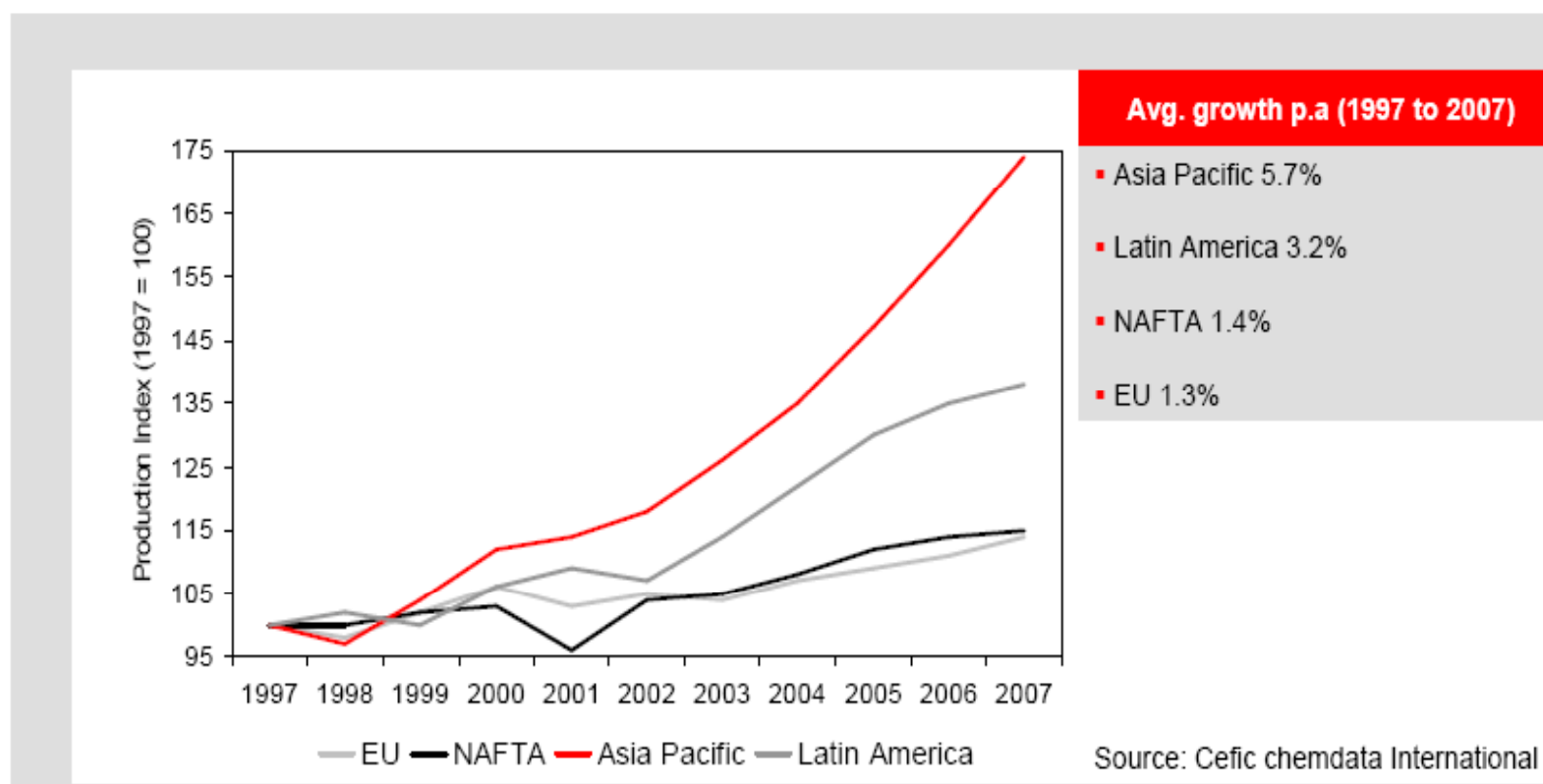
• Domestic Waste

- Increase in living standards leading to higher generation of domestic waste.
- Insufficient infrastructure for management of municipal solid waste.
- Low awareness of People for Municipal Solid Waste.
- Conversion of domestic waste into energy or other industrial material

Sustainability



- Asia Pacific has been the fastest growing region for chemical production in the last one decade (5.7%) before the financial crisis of 2008-09....
- Gujarat is well positioned to benefit from these trends and build a sustainable future





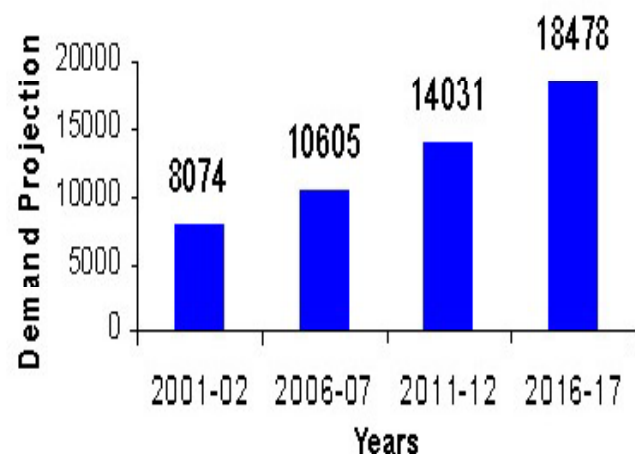
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Energy Demand Vs Supply

Capacity Addition Planned Till 2012 (in MW)

Year	State	Central	Private	Total	Cumm. Add.
Capacity as on 25 th February , 2010					11711
2009-10	250	402	750	1402	13118
2010-11	1060	421	700	2181	15294
2011-12	860	383	2222	3465	18359
Total	2170	1206	3672	7048	



- The state whose installed capacity (13566 MW Including wind generation) is 3rd highest in the country i.e. Maharashtra 20868 MW & Tamil Nadu 14408 MW.
- The demand projected by 2017 is 18478 MW for the proposed projects as on date.
- It is estimated by 2017 , Gujarat will have the capacity to generate 40,039 MW (double the projected demand) to meet the requirement of any additional projects due to the rapid industrialization.

Gujarat – Fuel Mix Additions till 2020



Fuel Mix (MW)	At the end of 2007	%	Addition 2008-2020	%	At the end of 2020	%
Coal	4829	51%	13393	60%	18222	58%
Lignite	715	8%	2325	10%	3040	10%
Hydro	779	8%	0	0%	779	2%
Gas/Naptha/FO	2610	27%	2872	13%	5482	17%
Nuclear	559	6%	0	0%	559	2%
Non Conventional			3600	16%	3600	11%
Total	9492	100%	22190	100%	31682	100%

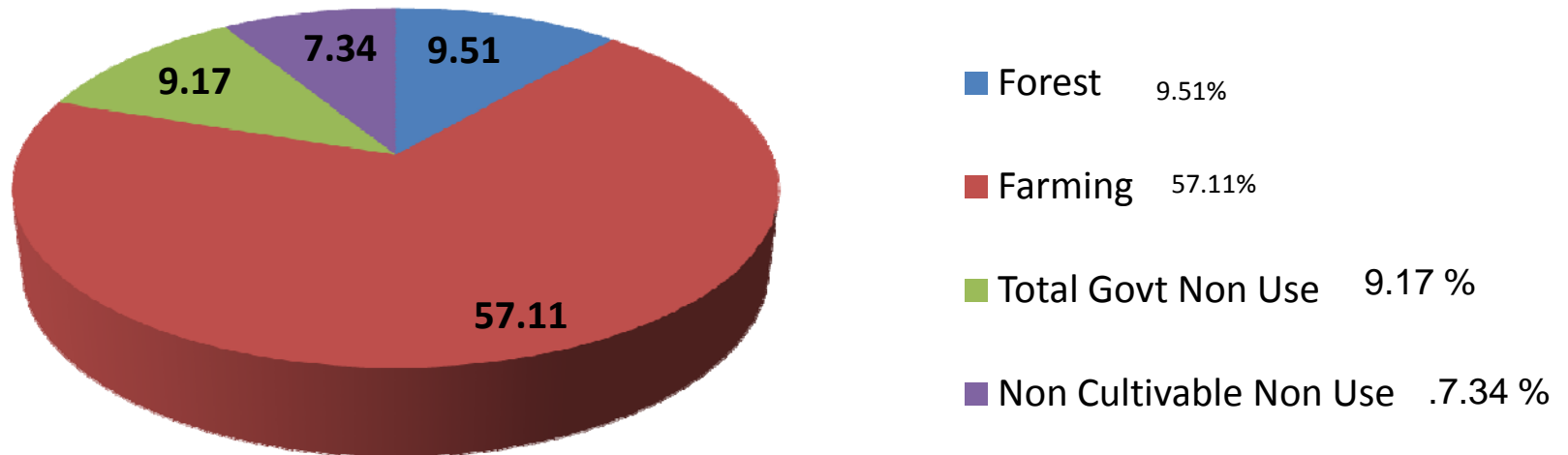
Sound Environmental Infrastructure - Key enabler



- 6 Hazardous Solid Waste Disposal sites
(*Vatva, Naroda, Nandesari, Ankleshwar*, Surat*, Vapi**)
(* ISO 14001 Certified)
- 6 Treated Effluent Conveyance Pipelines
(*Ahmedabad, Vadodara, Dahej, Ankleshwar, Sachin, Sarigam*)
- 19 Common Effluent Treatment Plants
- 4 Hazardous Industrial Waste Incinerators
(*Nandesari, Ankleshwar, Surat, Vapi*)
- Gujarat Cleaner Production Centre



Land Use & Community – Gujarat

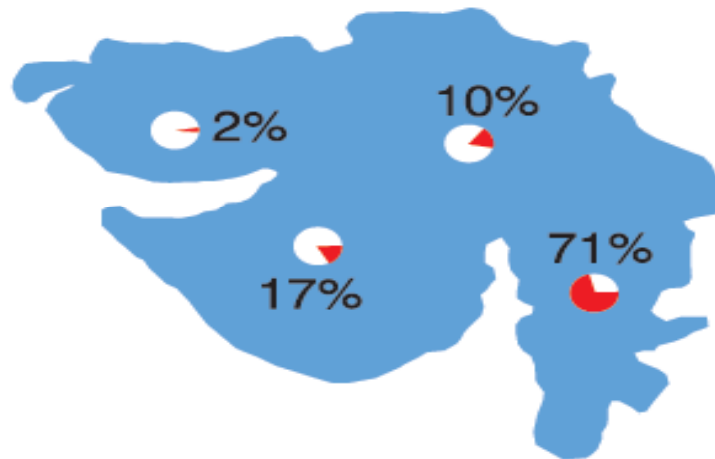


- ✓ The Basic Raw materials for Chemical Industry lie within or at Vicinity of Forests.
- ✓ Increase in Population & Rapid increase in Infrastructure development. (Ahmadabad – 500 Sq KM) causing increased interaction of communities with near by Industries leading to a boost in concerns & expectations of the Communities from the Industry.
- ✓ No Mining or Extraction of Minerals near Protected areas (16,440 Sq km Protected Forests / sanctuaries+ 497 Sq km National Parks)

Water



- Domestic & Industrial water Demand for year 2025 are assessed to be 2000 Million Cubic Meters (MCM) per year. Major shortfalls are expected



Fresh water availability in Gujarat
Source: WASMO – Government of Gujarat

- Total fresh-water availability in Gujarat:
- Surface water- 38,100 MCM
 - Ground Water- 12,000 MCM