

## Industrial CO<sub>2</sub> Emissions and Mitigation Options

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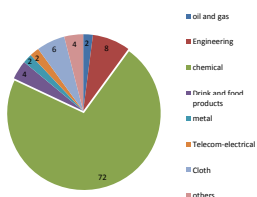
Workshop on 'Climate Change Adaptation in Industrial Estates of Gujarat', Ahmedabad December 15, 2011

### Climate Change and NIE

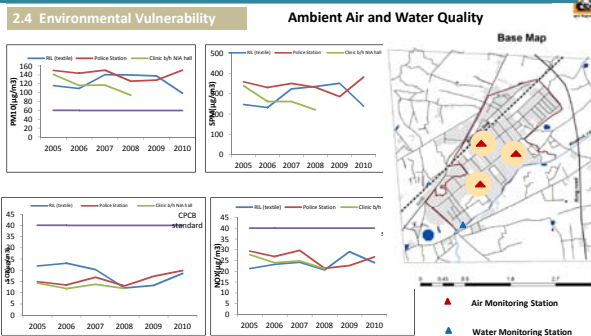
- How Climate Change will impact industries in NIE?
  - Direct Impacts
    - Change in climate parameters (risk from high temperature; increase in cooling requirements)
    - Flooding (leaching of toxic chemicals)
  - Indirect Impacts
    - » Water Scarcity
    - » Impacts on agriculture (food industries, textile industry)
    - » Impacts on forests (paper and pulp industries,
    - » Energy Costs (future regulations)
- High awareness (80%) regarding climate change but low preparedness

### Industry Survey

- Sample Size: 50 industries
- Questionnaire based survey
- Included industry profile, energy consumption (source, quantity); water and waste generation and disposal
- Majority (90%) were small-scale industries
- Highest electricity consumption was by metal followed by chemical. Lowest was food industry

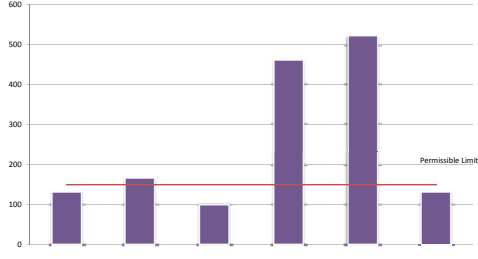


### Climate Change Adaptation Plan for Naroda Industrial Estate (Ahmedabad)



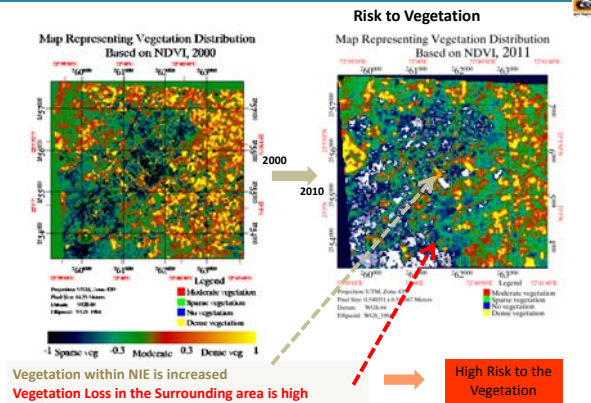
All other parameters are within limits except PM10  
Information on other toxic emissions and their health impacts is not known

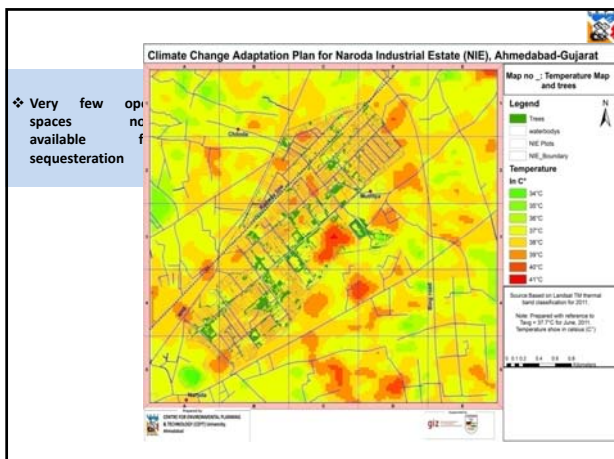
### Particulate Matter Levels in Stack Emissions



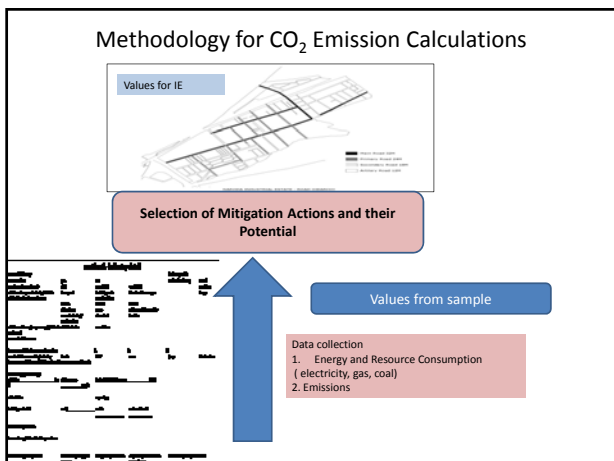
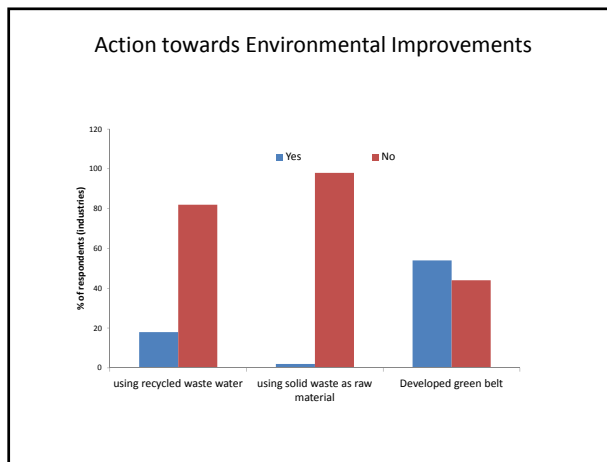
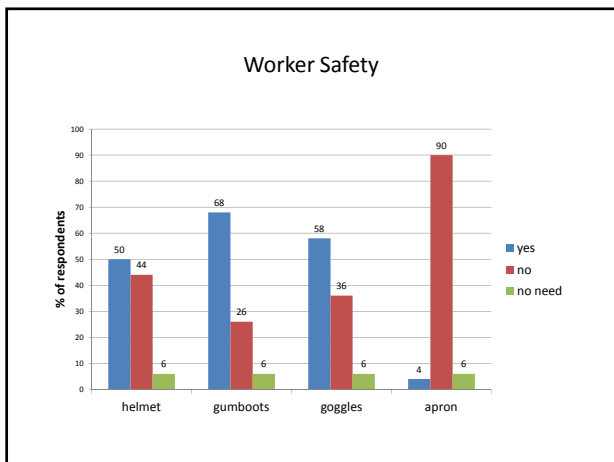
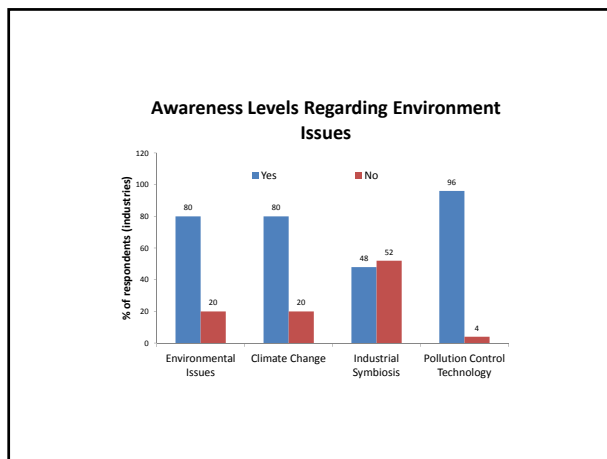
- Stack data available for only 15 industries from GPCB

### Climate Change Adaptation Plan for Naroda Industrial Estate (Ahmedabad)



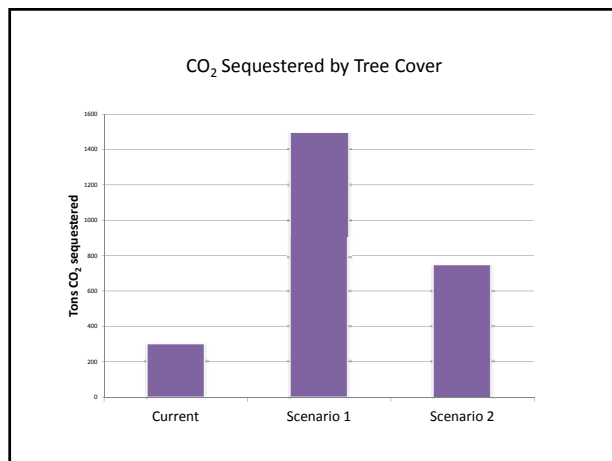
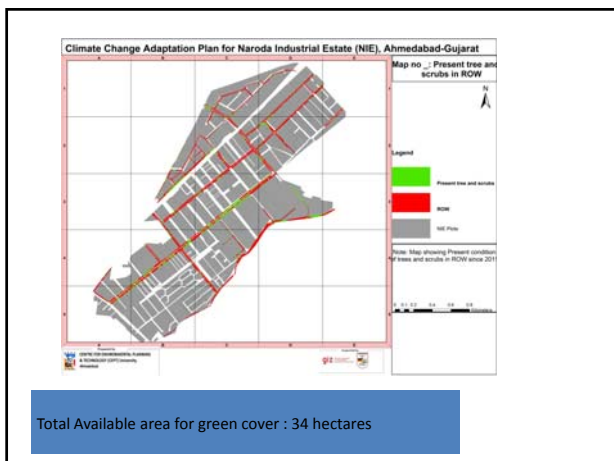
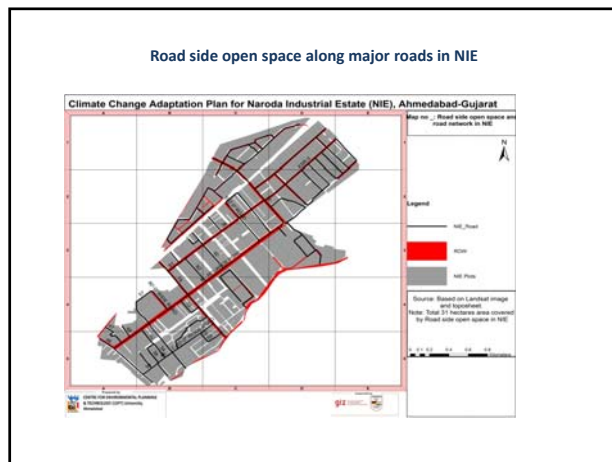
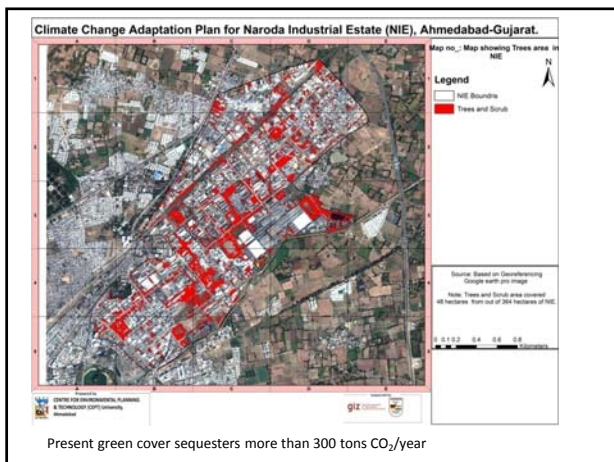
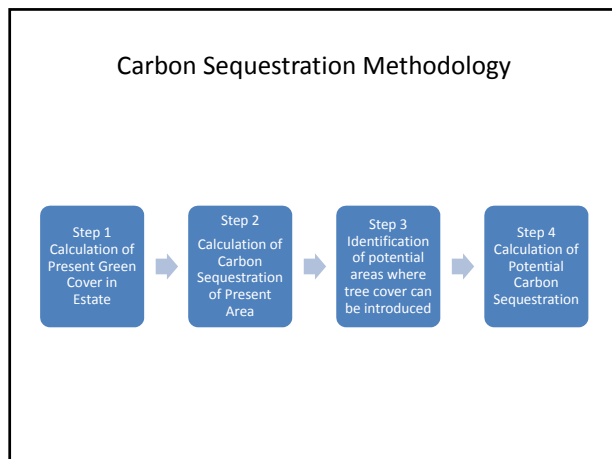
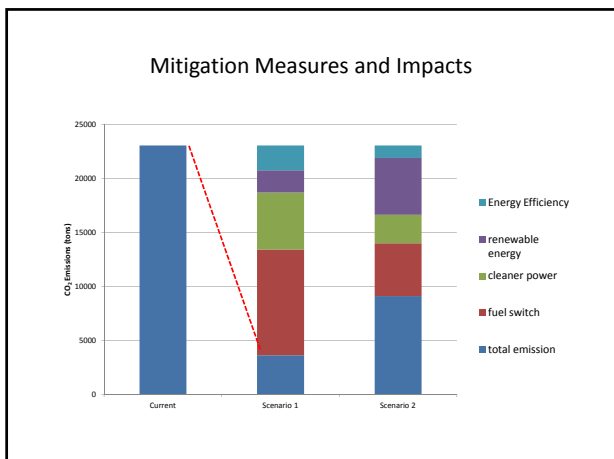


❖ Very few open spaces available for sequestration



### Strategies for Emission Reductions

	Proposed Policies	Co-benefits
Estate Level	Improvement in green cover	- Better flood management -Reduced urban heat island effect -Reduction in energy use - Better air quality
	Cleaner Electricity	-Air quality benefits
Industry Level	Use of renewable energy (waste to energy)	-Money Savings to Industry -Better worker health
	Improving Efficiency	-Money Savings to Industry -Building environment consciousness amongst employees/workers
	Fuel Switch	-Money Savings to Industry -Building environment consciousness amongst employees/workers



### Identification of Trees with High Sequestration Potential

Scientific Name	Common Name	Sequestration Potential (tC)
Ficus Religiosa	Piplo	4.91
Ficus Bengalensis	Vad	4.46
Mangifera Indica	Ambo	3.59
Delonix regia	Gulmohar	2.44
Butea Monosperma	Kesuda	2.41
Peltaforum Pterocarpum	Peela Gulmohar	2.30

Source: Sequestered standing carbon stock in selective tree species grown in University campus at Aurangabad, Maharashtra, India. S. L. Chavva

### Summary

- There is significant scope for environmental improvements (industrial ecology, water recycling measures, energy savings)
- Certain policies such as efficiency improvements, cleaner fuels and better technologies are no-regret options.
- If policies are supported with incentives and, NIA can go on to become a model industrial estate association in the country
- Some of these actions that help in climate change mitigation and adaptation also deliver a number of co-benefits – they should be implemented anyway
- Key institutions that have a role to play include the **Municipal Corporation** and **Industry Confederation**
- Main suggestion is to improve monitoring, reporting and verifying energy consumption and emissions from the estate