

Household Energy Consumption and Air Pollution In Developing Countries

Data and Information
Needs for the Decision
Makers

A stylized silhouette of a mountain range in shades of teal, located at the bottom right of the slide.



Outline of Presentation

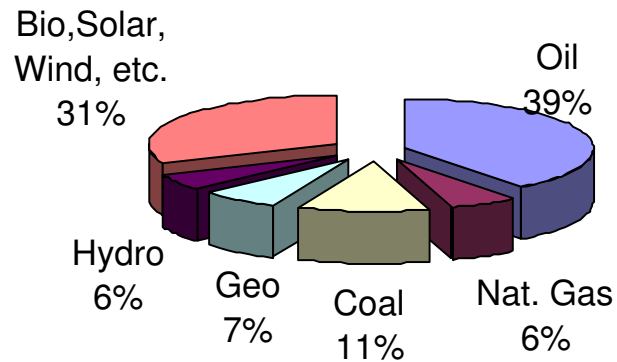
- ◆ Background
 - ◆ Household energy consumption
 - ◆ Air Quality Standards
 - ◆ Sources of Pollution
 - ◆ Air Quality Monitoring
 - ◆ Data and Information for the Decision Makers
 - ◆ Recommendations
- 
- A decorative graphic at the bottom right of the slide, consisting of a silhouette of a mountain range in shades of teal and light blue.

Background

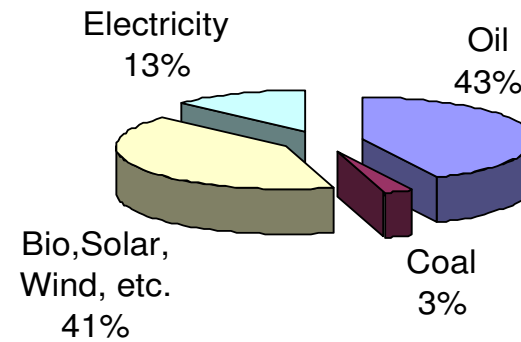
The image features a solid teal background with a subtle gradient. In the bottom right corner, there is a silhouette of a mountain range, rendered in a slightly darker shade of teal. The word "Background" is centered in the upper half of the image in a light yellow, sans-serif font with a thin black outline.

ENERGY SUPPLY AND DEMAND

PRIMARY ENERGY SUPPLY



FINAL ENERGY DEMAND



USE OF OIL BY SECTOR

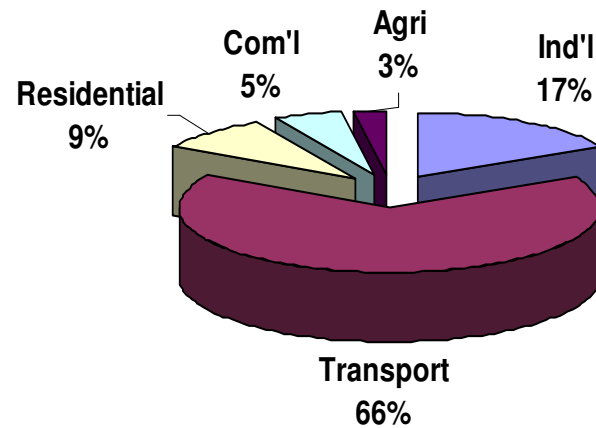
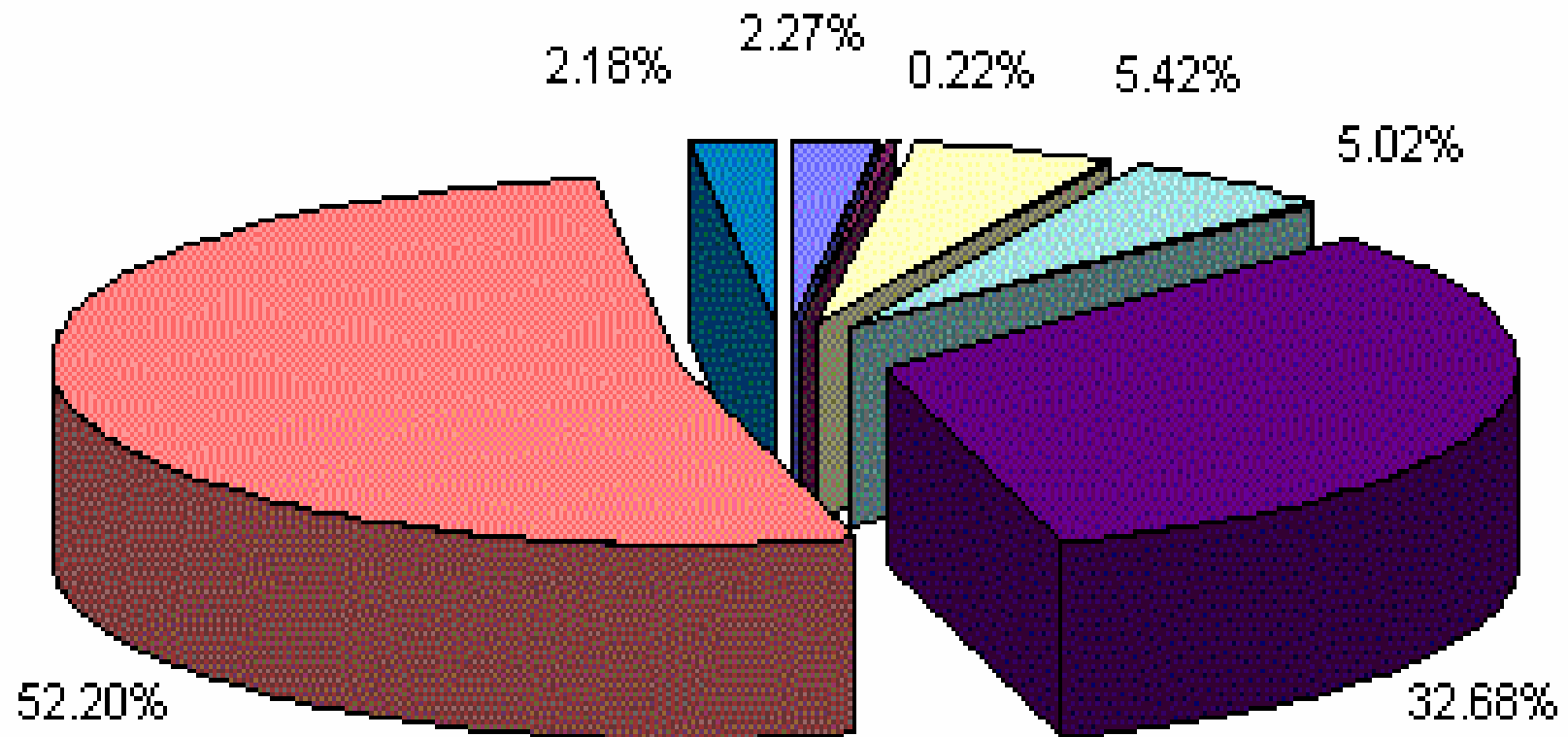


Figure 1
1996 Primary Energy Mix



■ Indigenous Coal	■ Indigenous Oil	■ Hydro	■ Geothermal
■ NRE	■ Imported Oil	■ Imported Coal	

ALTERNATIVE FUELS PROGRAM

To achieve energy independence and fuel diversification while meeting environmental challenges through the utilization of alternative fuels



Natural Gas



**Coco-methyl Ester (CME)
or *Coco-Biodiesel***



Ethanol

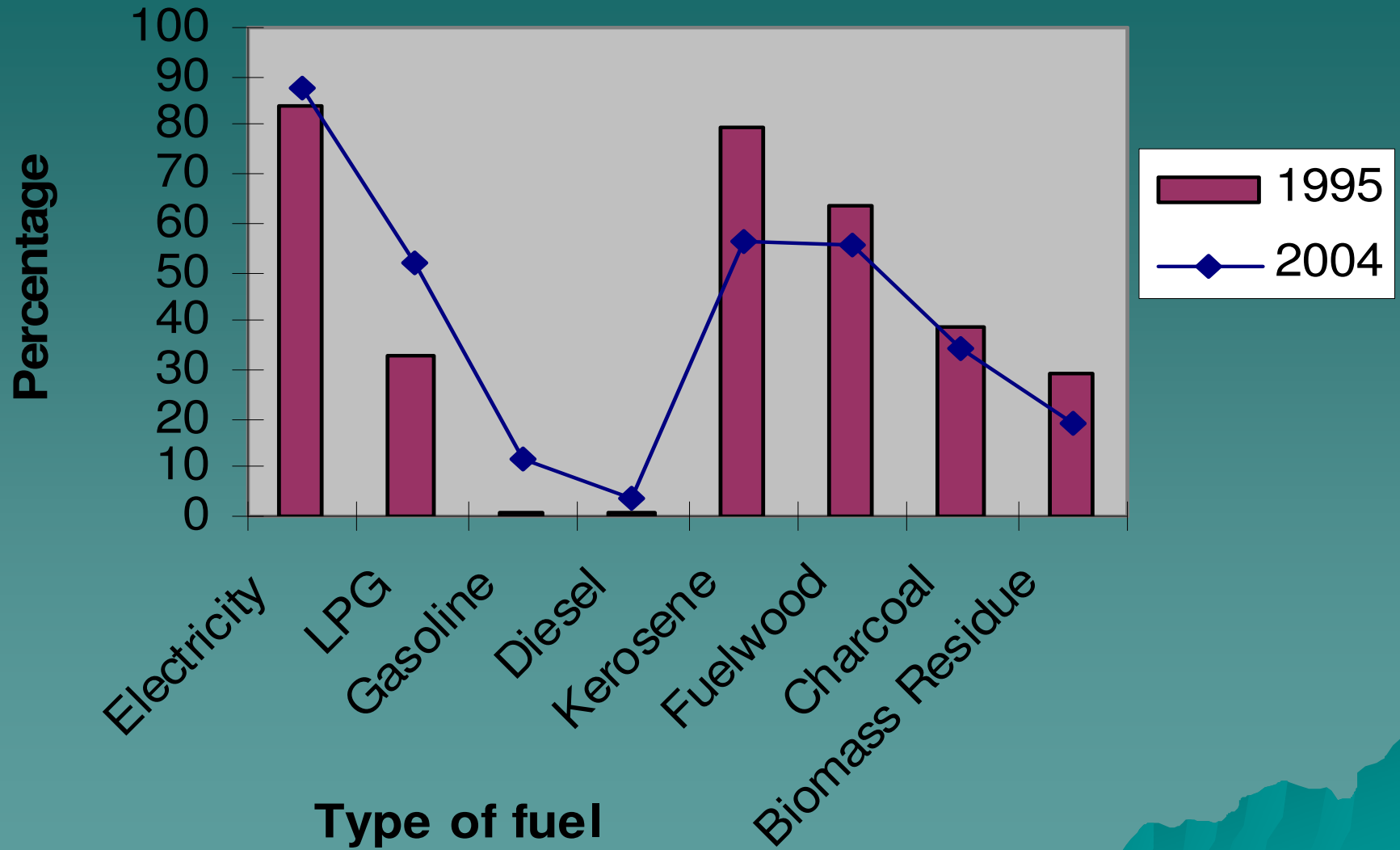


**Others
(autogas, fuel cell, hydrogen, EV)**

Household Energy Consumption

The background is a solid teal color. At the bottom right corner, there is a silhouette of a mountain range in a slightly darker shade of teal.

Household energy consumption



Electricity - lighting

Type	Percentage	Annual Consumption (KWh)
Fluorescent	80	132
Incandescent lamp	53.4	79
Compact fluorescent lamps	36.9	63
Other lamps	16	34

Electricity – household recreation

Type	Percentage	Annual Consumption (KWh)
Colored TV	80.4	210
DVD,CD	24.7	92
Stereo Radio		243 80

Electricity – cooling/heating

Type	Percentage	Annual Consumption (KWh)
Electric fan	99.4	296
Air conditioner		3,914
Refrigeration		1,500
Cooking	15.8	223

Use of flat iron

Other energy consumptions

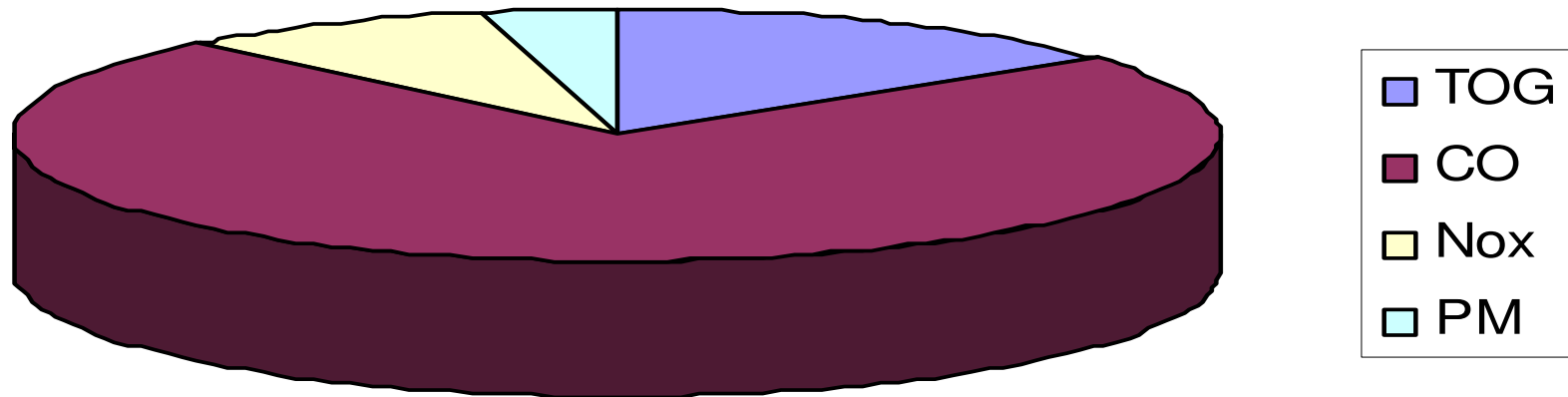
Type	Percentage	Consumption
LPG	100	9 of 11-kg tanks/year/household
Gasoline and diesel	98	Used for transportation
	4.9	Power generation
Kerosene	77.6	Lightning
	40/15	Fire starting/cooking
Fuelwood, charcoal biomass residues	99	cooking

Sources of Pollution

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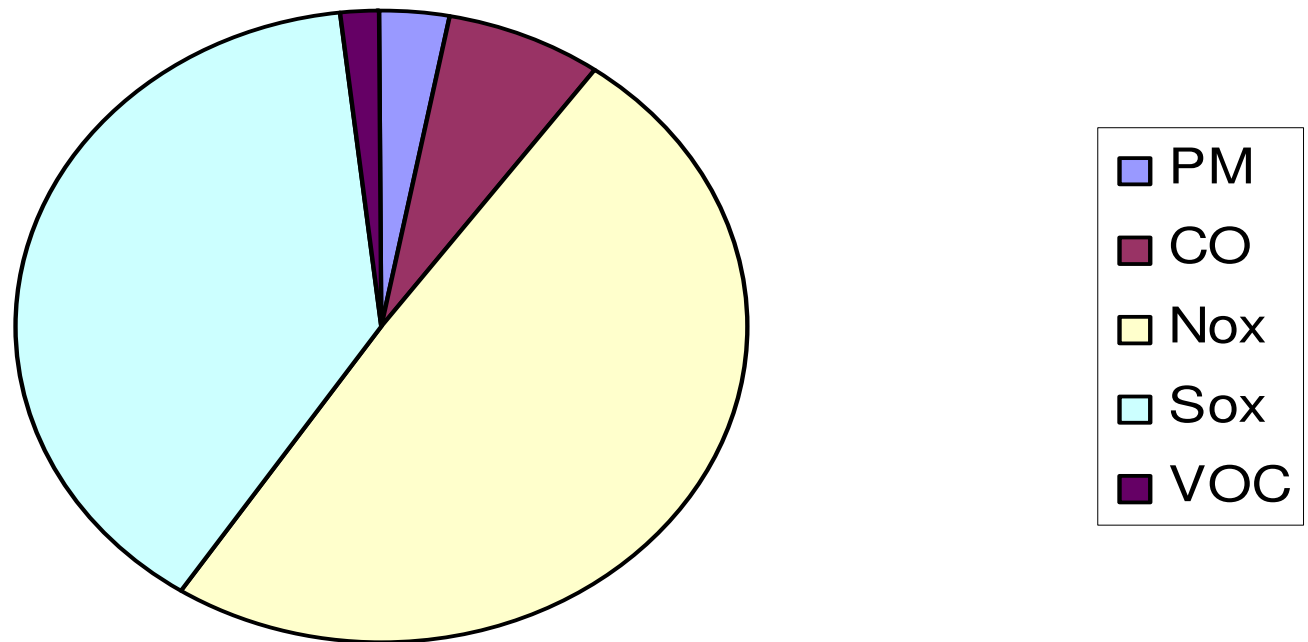
Mobile sources

**Emission estimates for mobile sources in
NCR (tons)**



Stationary Sources

**Emission estimates for power plants, 2001
(tons)**

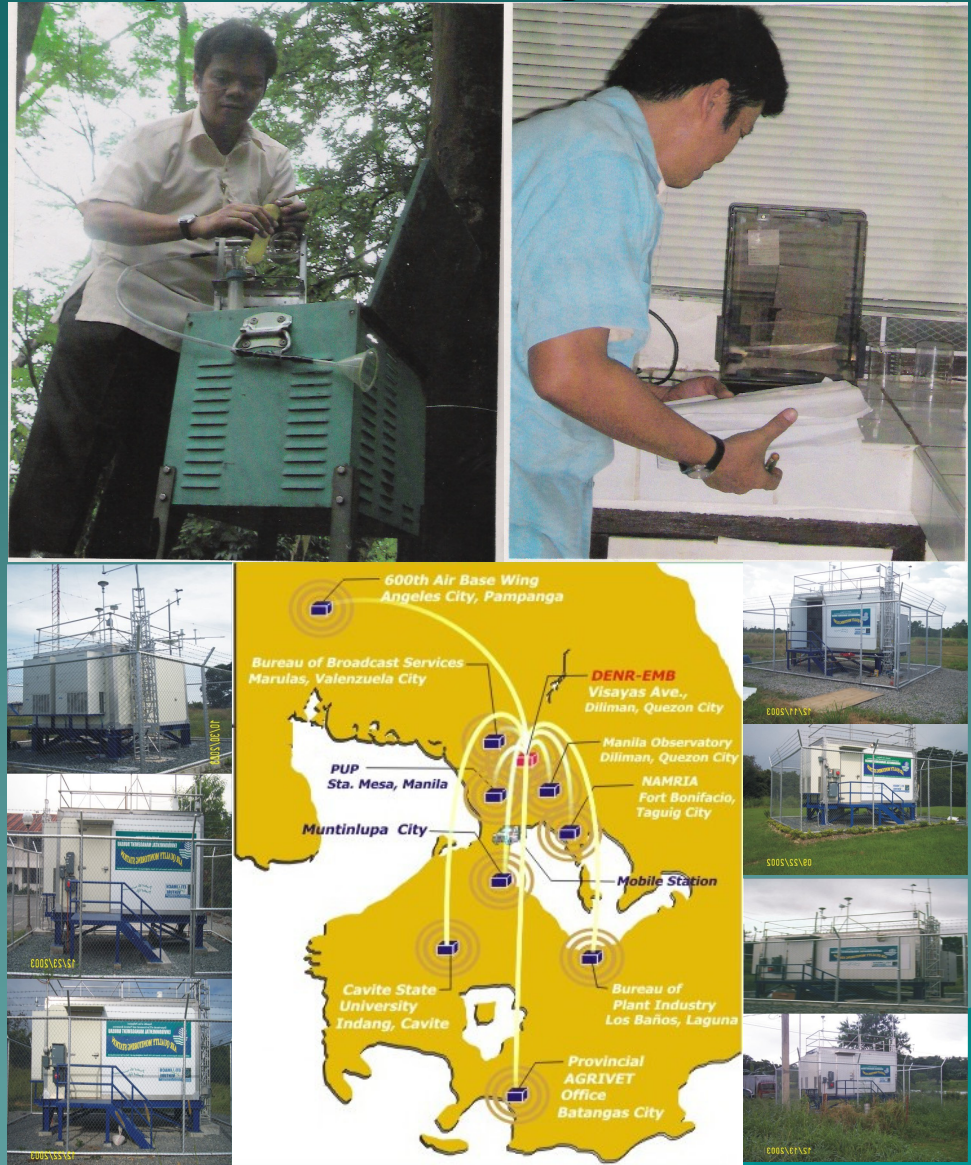


AIR QUALITY STANDARDS

- ◆ Ambient Air Quality
 - Roadside
 - Industries
- ◆ Source Specific Air Pollutants
- ◆ Limits for Metals, Dioxins and Furans-Treatment Facilities using Non-burn Technologies
- ◆ Motor Vehicle Sources

AMBIENT MONITORING

- ◆ 45 sampling stations maintained & monitored nationwide
- ◆ 2 automatic monitoring stations in Regions 7 & 10
- ◆ 10 automatic monitoring stations in the Metro Manila Airshed



STATIONARY SOURCES



“LINIS HANGIN” PROGRAM “BANTAY TSIMNEYA”

1. Stack Testing

- 413 stack sampling tests conducted nationwide (CY 2005)

2. Industry Monitoring

- Out of 9,659 firms issued permit to operate (CY 2005)
 - 6,580 (68%) monitored
 - 611 issued NOVs



MOBILE SOURCES

“LINIS HANGIN” PROGRAM “BANTAY TAMBUTSO”



1. Roadside Apprehension

- 31% passed the emission testing (CY 2005) out of 20,581 flagged down & tested diesel-fed vehicles

2. PETC monitoring (JAO LTO 2003-81)

- 100% monitored in Metro Manila, permits of 78 PETCs were recommended for cancellation (CY 2005)



<< Outline



MOBILE SOURCES

NEW VEHICLES

- **Certificate of Conformity (COC)**

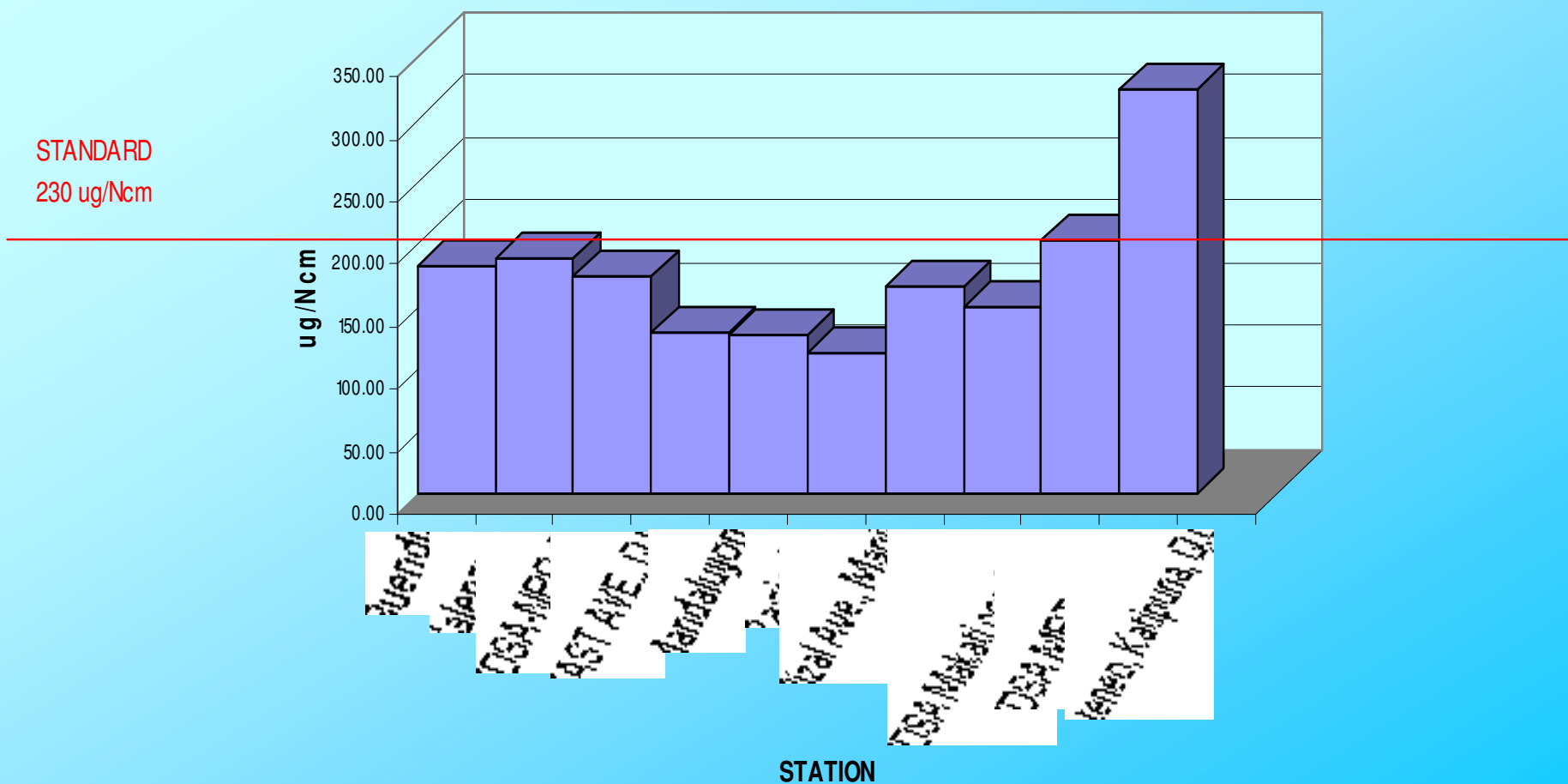
- 753 motor vehicles
- 286 motorcycles



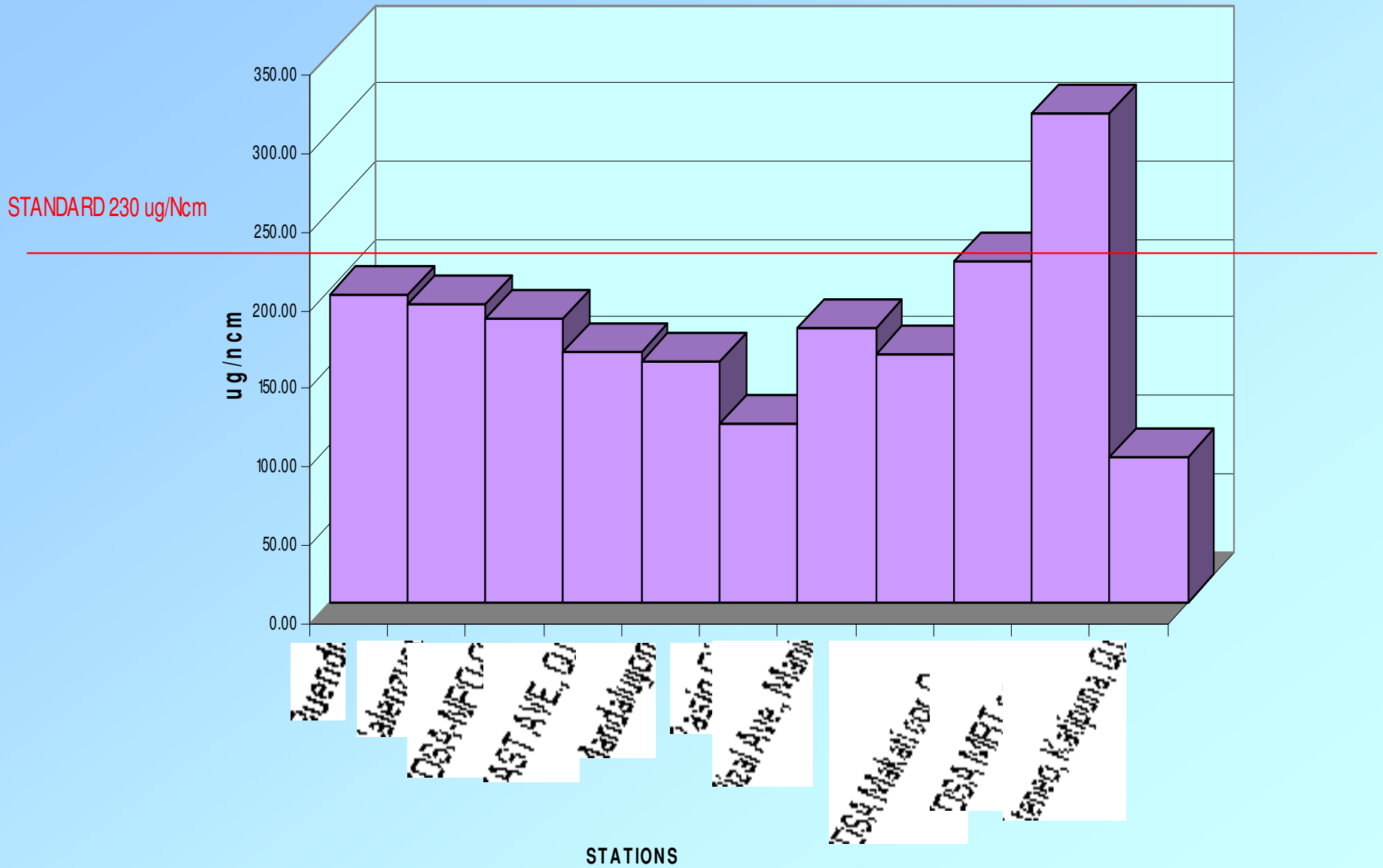


Pollutants measured

Manual Ambient Air Quality Monitoring for Total Suspended Particulates (TSP)
2nd Quarter 2005



Manual Ambient Air Quality Monitoring for Total Suspended Particulates TSP 1st Quarter 2005



STACK MONITORING (BOILER)

Industry type	Capacity BHP	SO ₂ ,mg/Nm	PM,mg/Ncm	CO,mg/Ncm
Food Mfg	300	1,919	44	26
Brewery	600	419	33	4.33
Refinery	3,202	1,510	43	13

Legal Framework

- ◆ Philippine Clean Air Act of 1999

The Act envisions to maintain ambient air quality that is within the guideline values conducive to public health, safety, and welfare, and the reduction of air pollutants by minimizing the emissions from area, stationary, and mobile sources as well as improving fuel quality.

PROGRAM ON AIR POLLUTION MANAGEMENT

DATA AND INFORMATION ON AIR QUALITY

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graph TD; A[DATA AND INFORMATION ON AIR QUALITY] --> B[INTEGRATED AIR QUALITY IMPROVEMENT FRAMEWORK]; B --> C[AIR QUALITY ACTION PLAN];
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INTEGRATED AIR QUALITY IMPROVEMENT FRAMEWORK

AIR QUALITY ACTION PLAN

AIR QUALITY MONITORING and INFORMATION NETWORK

DATA AND INFORMATION AIR QUALITY STATUS REPORT



AMBIENT AIR QUALITY MONITORING STATIONS

NATIONAL AIR QUALITY STATUS REPORT

1) Extent of Pollution
(type and source)

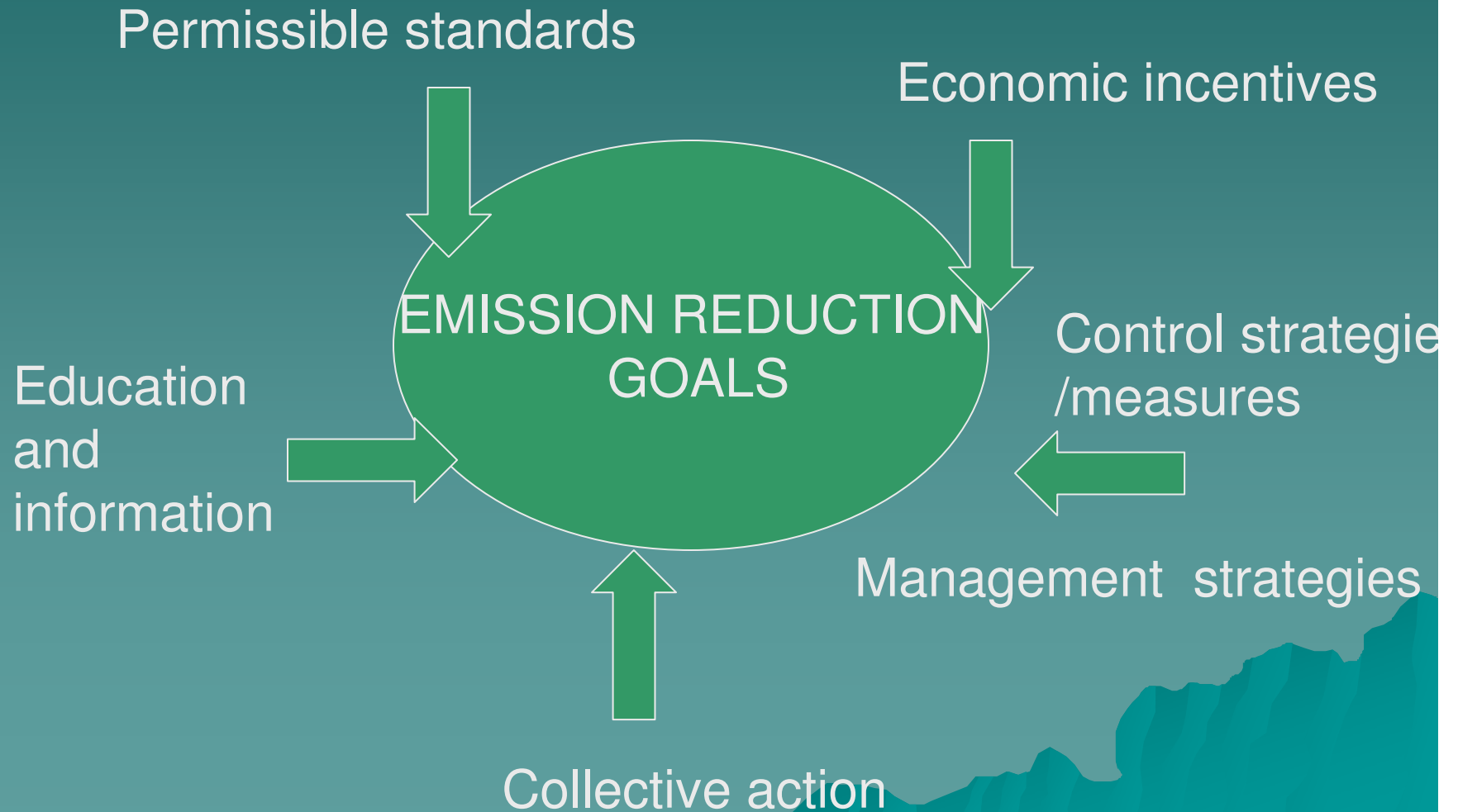
2) Critical Areas, Activities and Projects

3) Status,
Trends and
Projections

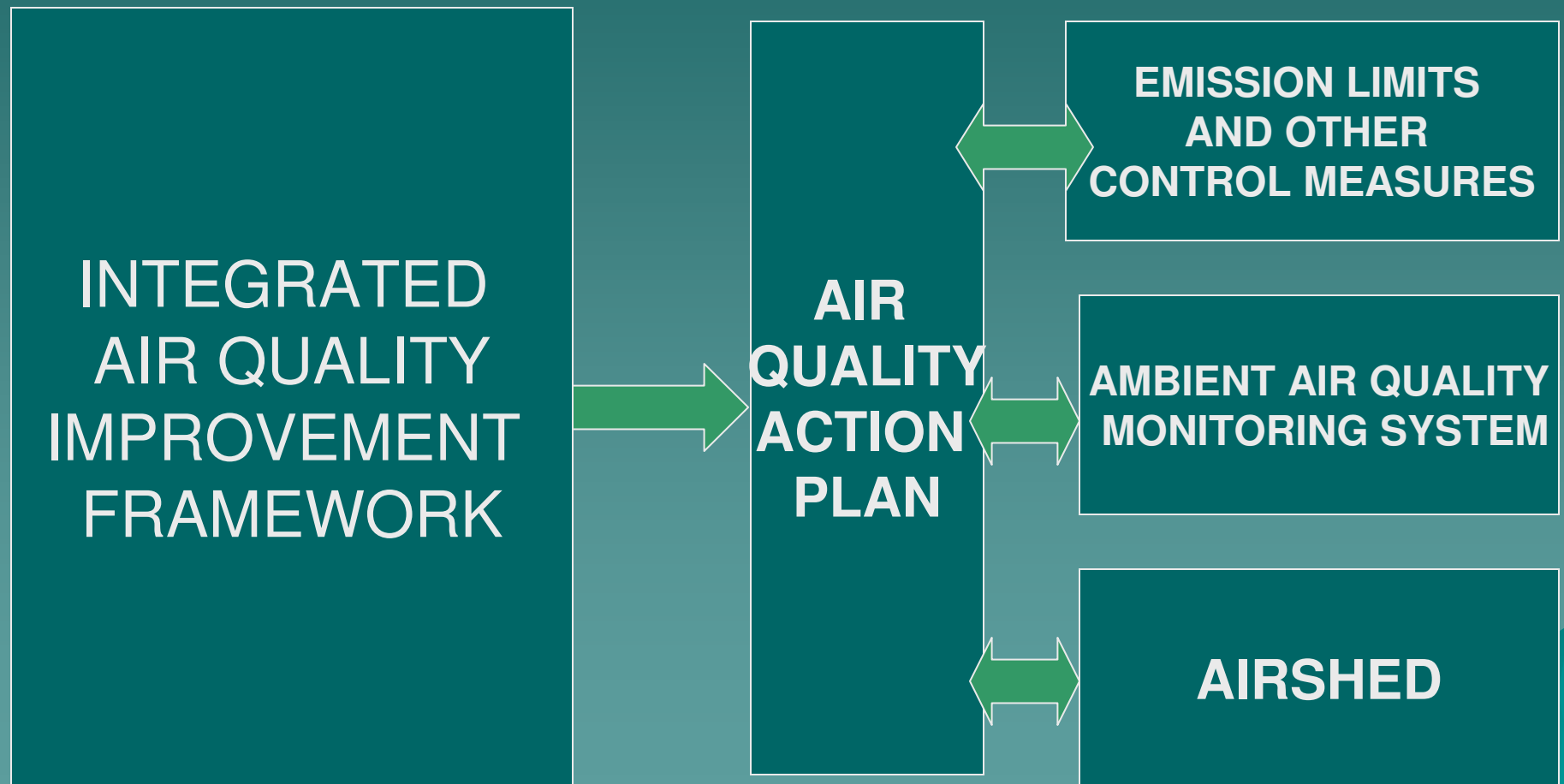
4) Recommendations for
Legislative and Executive
Actions

INTEGRATED AIR QUALITY IMPROVEMENT FRAMEWORK

Official blueprint with which all government agencies must comply with to attain and maintain air quality standards



AIR QUALITY ACTION PLAN



Recommendations

- ◆ Continue and strengthen implementation of CAA. Timetables should be fixed for measures such as the shift to low-sulfur or cleaner fuels, the use of catalytic converters in all vehicles,
- ◆ moratorium on industrial expansion in urban centers, the implementation of public mass transport systems, and other measures that will prevent pollution and clean our air.

Recommendations

- ◆ Adoption of full-cost accounting in the cost/benefit analysis of various technology and fuel options in transportation and industry

Recommendations

- ◆ Review of the country's transport mix, energy mix, power generation mix, and fuel mix for closer harmonization with the requirements of clean and healthy air for all.
- ◆ More research on best practices and alternative technologies which can help the country shift to non-polluting methods of transportation, power generation, and industrial production.

Recommendations

- ◆ Continue and expand information and education programs for cleaner air, focusing on impact to well-being of the people and the ecosystem, and what each one can