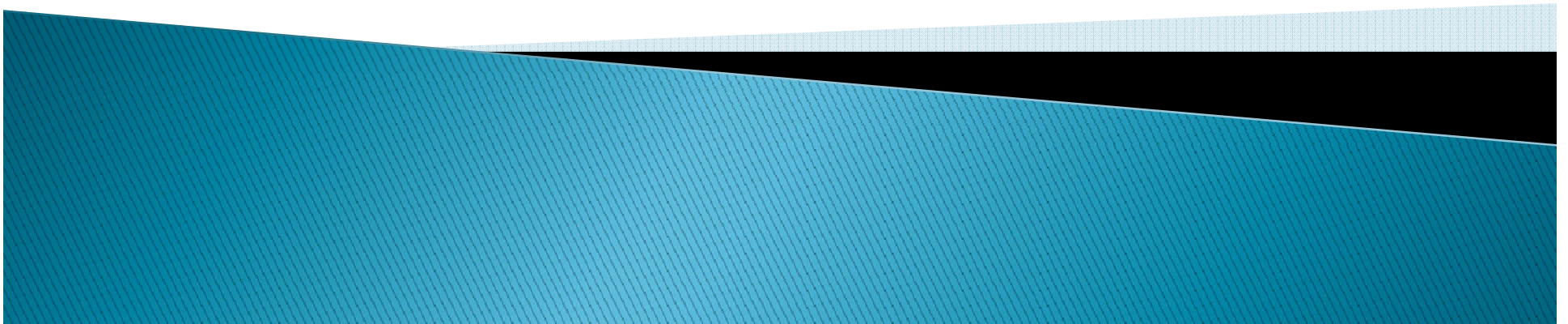


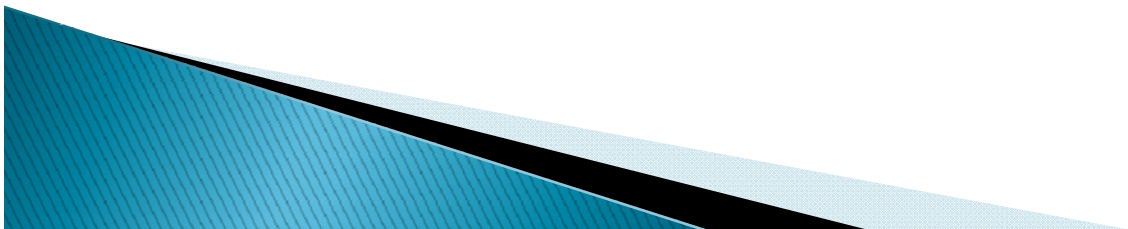
Air Quality Management in Nepal

27 December, 2013



Presentation Outline

- ▶ Issues
- ▶ Standards
- ▶ Initiatives of MoSTE
- ▶ Impact of air pollution
- ▶ Air Quality monitoring stations
- ▶ Way forward – CDM mechanism



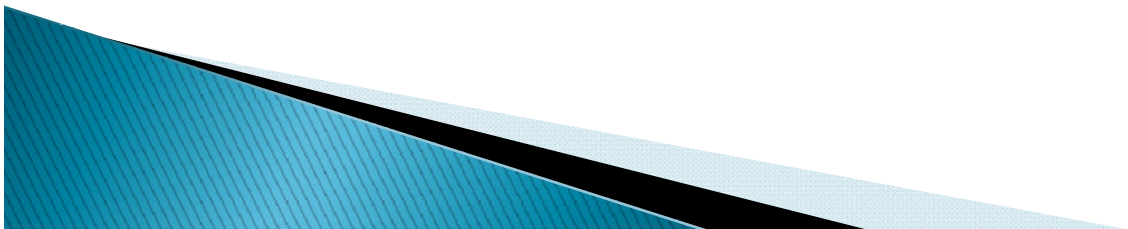
Issues

- Rapid Urbanization
- Brick kilns in operation in Kathmandu Valley
- Growing Numbers of Vehicles,
- Traffic Congestion and Increasing Demand of Fossil Fuel
- Industrialization
- Widening of road (dust)



Standards

- ▶ Nepal Vehicle Mass Emission Standard (Euro III), 2012
- ▶ Vehicle Emission Standards for Green Stickers
- ▶ National Ambient Air Quality Standard, 2012
- ▶ Brick Kiln Stack Emission Standard, 2008
- ▶ Standard for the industrial Boilers, Cement Industries,(2012) etc.



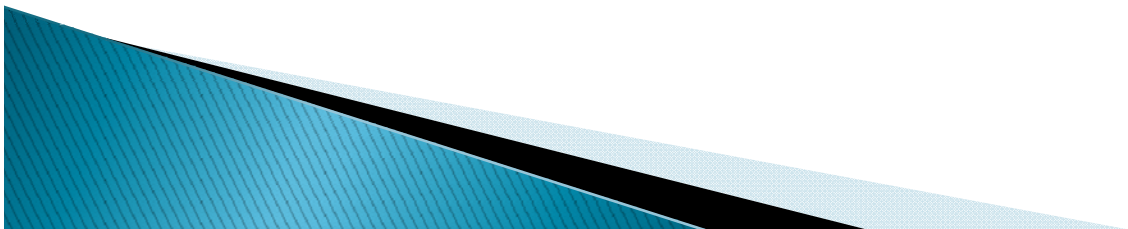
सूचना २

नेपाल सरकारले वातावरण संरक्षण नियमावली, २०५४ को नियम १५ ले दिएको अधिकार प्रयोग गरी देहाय बमोजिमको वायुको गुणस्तर सम्बन्धी राष्ट्रिय मापदण्ड, २०६९ (National Ambient Air Quality Standard, 2012) तोकेको छ ।

Parameters	Units	Averaging time	Concentration max	Test Methods
TSP	$\mu\text{g}/\text{m}^3$	Annual	-	High Volume Sampling and Gravimetric Analysis
		24-hours *	230	
PM ₁₀	$\mu\text{g}/\text{m}^3$	Annual	-	High Volume Sampler and Gravimetric Analysis, TOEM, Beta Attenuation
		24-hours *	120	
Sulfur Dioxide	$\mu\text{g}/\text{m}^3$	Annual **	50	Ultraviolet Fluorescence, West and Gaeke Method
		24-hours *	70	Same as annual
Nitrogen Dioxide	$\mu\text{g}/\text{m}^3$	Annual	40	Chemiluminescence
		24-hours *	80	Same as annual
Carbon Monoxide	$\mu\text{g}/\text{m}^3$	8 hours *	10,000	Non Dispersive Infra Red spectrophotometer (NDIR)
Lead	$\mu\text{g}/\text{m}^3$	Annual **	0.5	High Volume Sampling, followed by atomic absorption spectrometry
Benzene	$\mu\text{g}/\text{m}^3$	Annual **	5	Gas Chromatographic Technique
PM _{2.5}	$\mu\text{g}/\text{m}^3$	24-hours *	40	PM _{2.5} sampling gravimetric analysis
Ozone	$\mu\text{g}/\text{m}^3$	8-hours *	157	UV spectrophotometer

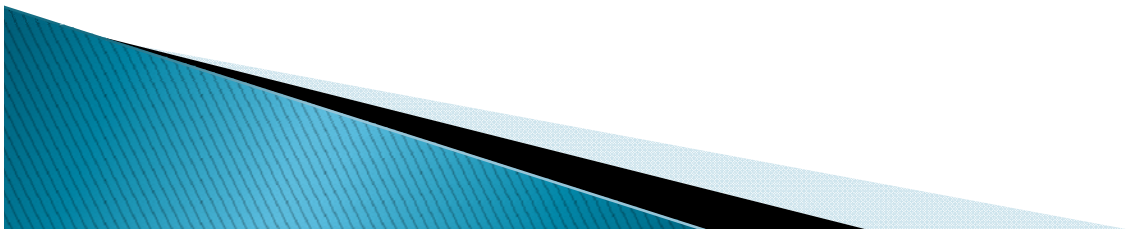
Initiatives of MoSTE

- 1991 – Ban on import of three wheelers
- 1992 – Banned entrance of two stroke vehicles in Katmandu valley
- 1995 – Introduction of Vehicle Emission Standards & Testing
- 1996 – Provision of Financial incentives for electric three wheelers
- 1997 – Promulgation of Environment Protection Act & Regulations



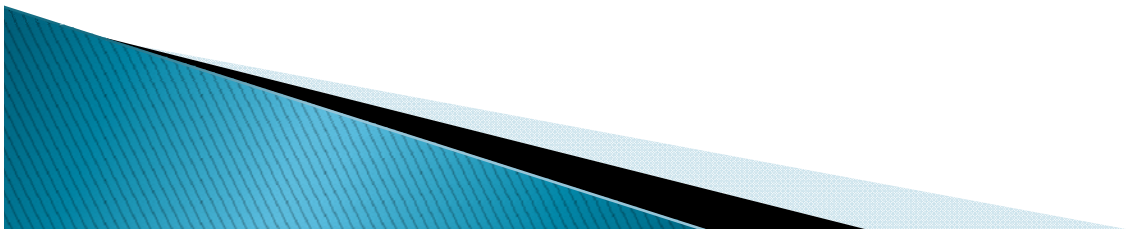
Initiatives cont..

- 1999 – Ban on Vikrams (diesel 3-wheelers) in Katmandu Valley
- 1999 – Ban on import of new 2 stroke vehicles and second hand vehicles
- 2000 –Introduction of Nepal Vehicle Mass Emission Standard (Euro I)
- 2002 – Establishment of Ambient Air Quality Monitoring System with six permanent stations in Katmandu valley (PM_{10} , $PM_{2.5}$, TSP, NO_x , Pb, Benzene



Initiatives cont..

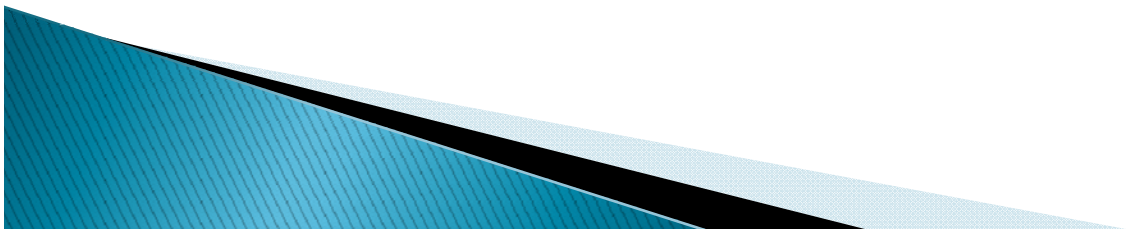
- 2003 – Introduction of National ambient air quality standards
- 2004/5 – Ban on running of moving Bull Trench Kiln in Katmandu Valley. Promotion of Fixed Chimney and VSBK.
- 2006 – Preparation of Action Plan Report on AQM
- 2008 – Publication of Air Emission Standards for Brick Kilns in Gazette
- 2012– Up gradation of Vehicular mass emission Standard and national Ambient air Quality standard
- 2012–Standards of Cement industries and Industrial Boilers.
- 2012– ban on Moving BTKs throughout the Nepal



Impacts of Air Pollution

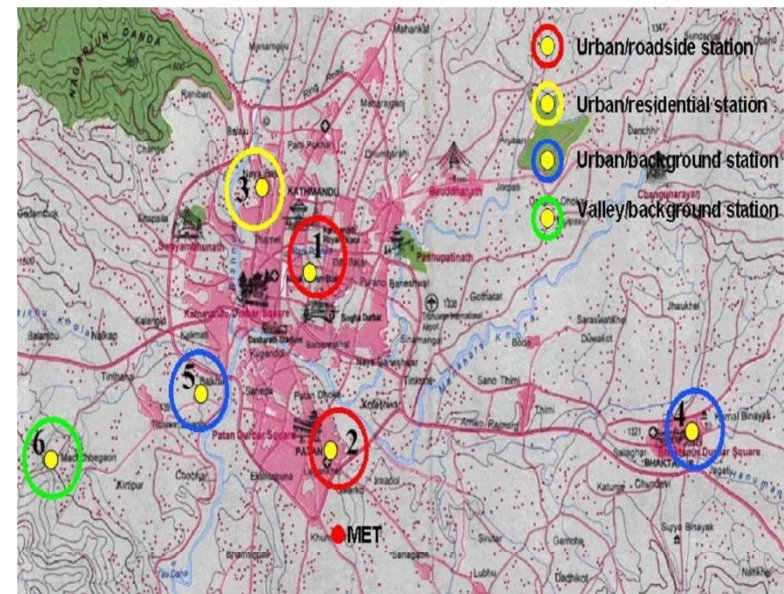
- ▶ Impact on Human Health
- ▶ Impact on Vegetation
- ▶ Impact on Visibility
- ▶ Impact of Climate Change

Economic cost associated with air pollution is difficult to calculate, it is multi-dimensional and obviously high

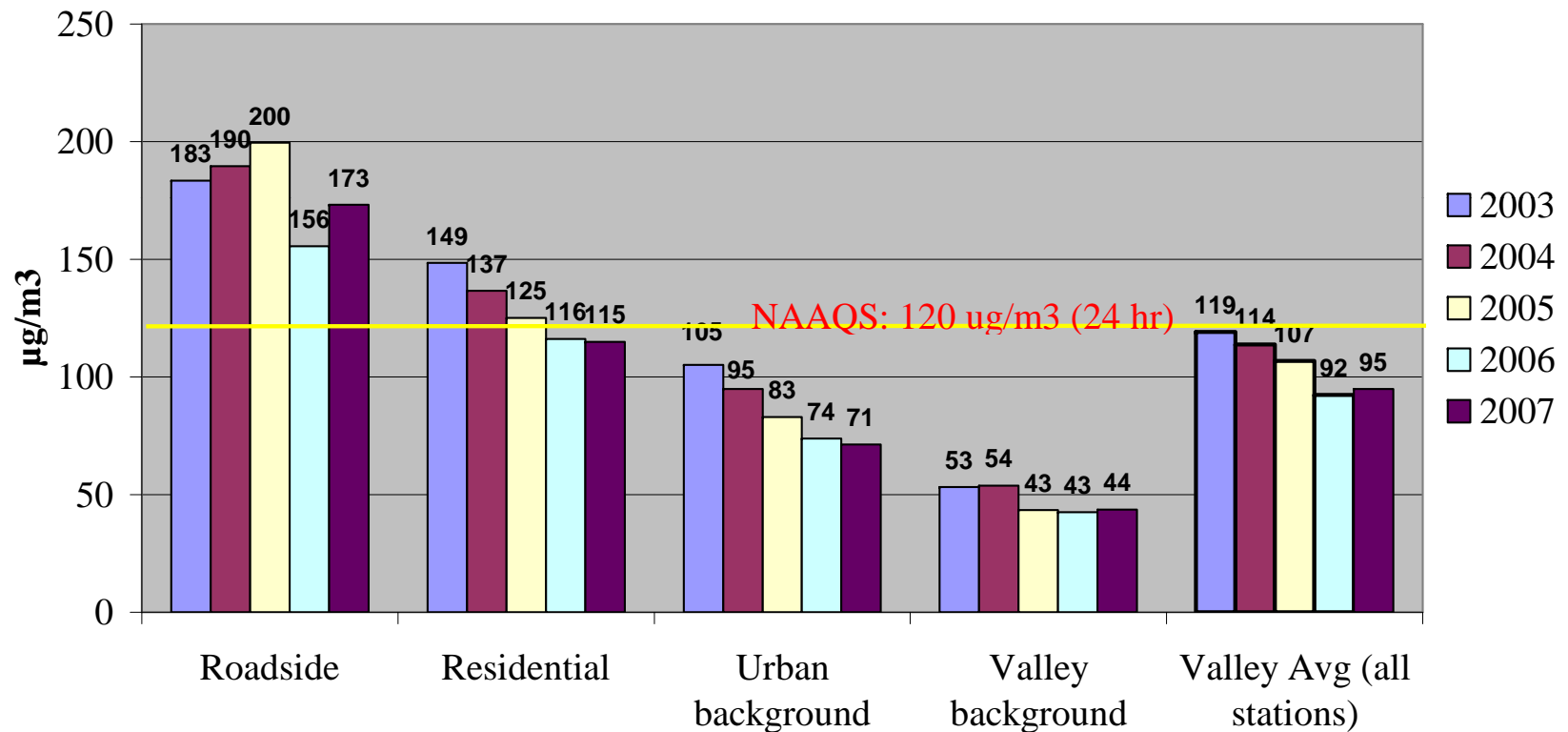


Air Quality Monitoring System,

- ▶ Organized effort with 6 stations in the Katmandu Valley.
 - Putalisadak & Patan (Urban Traffic Roadside station)
 - Thamel (Residential station)
 - Bhaktapur & Kirtipur (Urban Background)
 - Matsyagaon (Valley Background)
- ▶ Measured Parameters:
PM10,



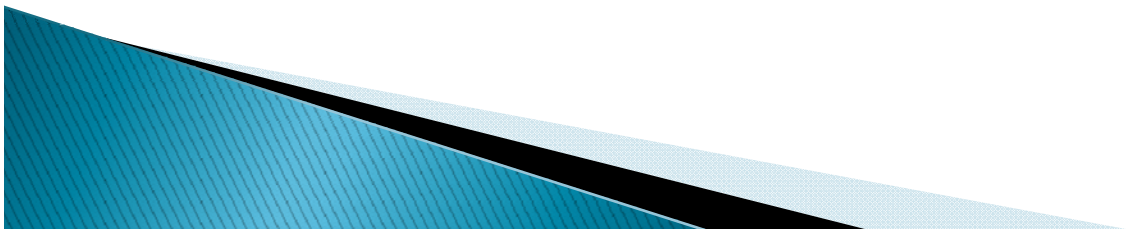
Air Quality Monitoring Data



*Source: Ambient Air Quality of Kathmandu Valley,
MOEST, 2007*

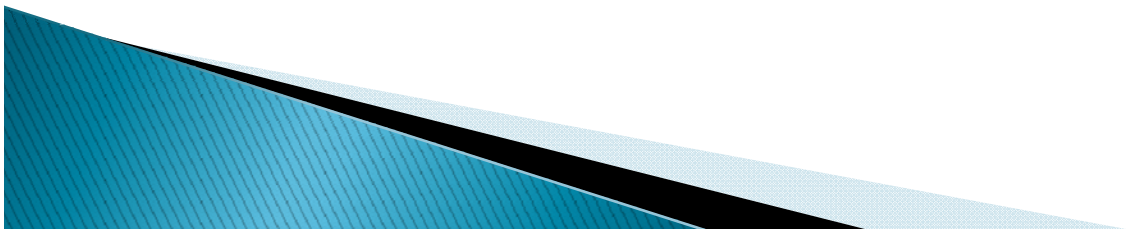
Present Status of Ambient Air Quality Monitoring Stations

- ▶ Three Stations are in operation (Bhaktapur, Putalisadak, and Machhegaun)
- ▶ Measured Parameter– PM₁₀
- ▶ National Standard for PM₁₀ –120 µg/m³
- ▶ Pollution level in Machhegaun is within standard and higher in other stations
- ▶ Maximum value is in Putalisadak
- ▶ Data available in www.moste.gov.np



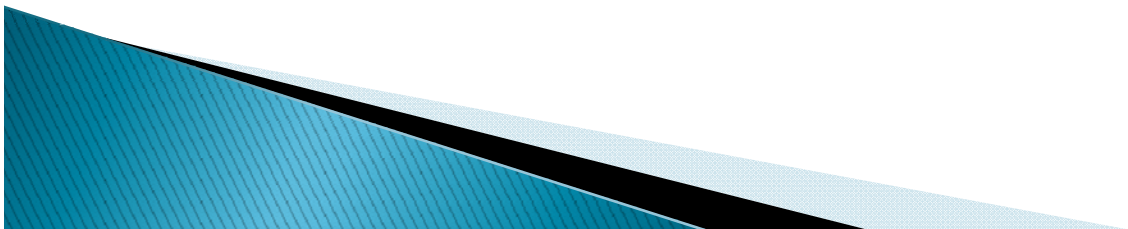
Program of Department of Environment

- ▶ Formulation of Action plan for Air Quality Management , future strategy
- ▶ Compliance Monitoring of Brick Kiln Stack Emission/ Vehicle Emission/DG Sets and Emission from other Industries
- ▶ Continuation of AQ Monitoring in Katmandu Valley (Installation of modern/real time equipment)
- ▶ AQ monitoring out side the valley.



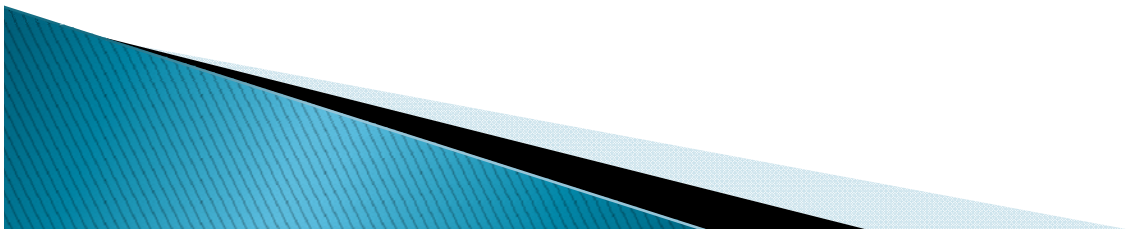
Challenges

- ▶ Continuous operation of air quality monitoring station
- ▶ Maintaining the rule of law/compliance .
- ▶ To regulate the fuel quality for vehicle.
- ▶ On road monitoring of the vehicle mass emission.
- ▶ Rapid and haphazard urbanization.
- ▶ Sustainability of program.
- ▶ Public health
- ▶ Technical and Institutional capacity



Way forward

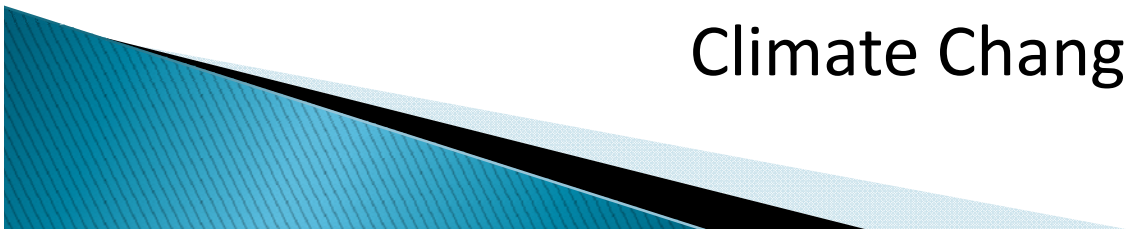
- ▶ Establishment of Department
 - ▶ Planning,
 - ▶ Operation,
 - ▶ Monitoring,
 - ▶ Enforcement
 - ▶ Policy formation etc.
- ▶ International mechanism
 - ▶ CDM mechanism



CDM Projects Approval Process

Stakeholder Meeting
27 Dec, 2013
Kumari Hall

Akhanda Sharma
SDE, CDM Section
Climate Change Management Division



Content

- ▶ Introduction of CDM
- ▶ Function and responsibilities of DNA
- ▶ Review process and Agencies Involved
- ▶ Project approval cycle
- ▶ Sustainable development criteria



Clean Development Mechanism

Kyoto Protocol (KP)

- ▶ Text adopted : 11 December 1997, Kyoto
- ▶ Entry into force : 16 February 2005 (Global)

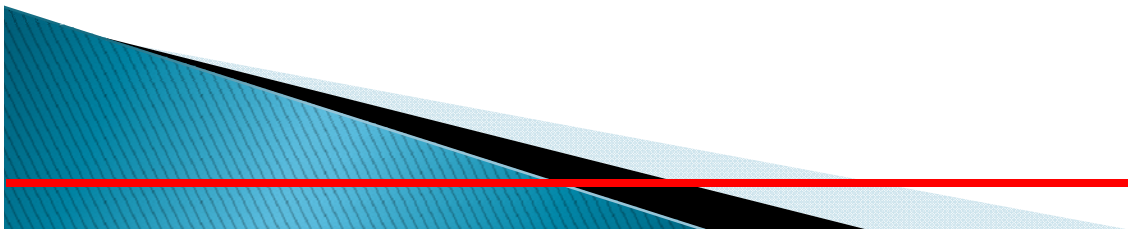
CDM Provisions

- ▶ Article 12 of the KP established the CDM to assist Parties:
- ✓ Not included in Annex 1 “In achieving SD”
- ✓ Included in annex 1 “ In achieving compliance with their quantified emission limitation and reduction commitments”



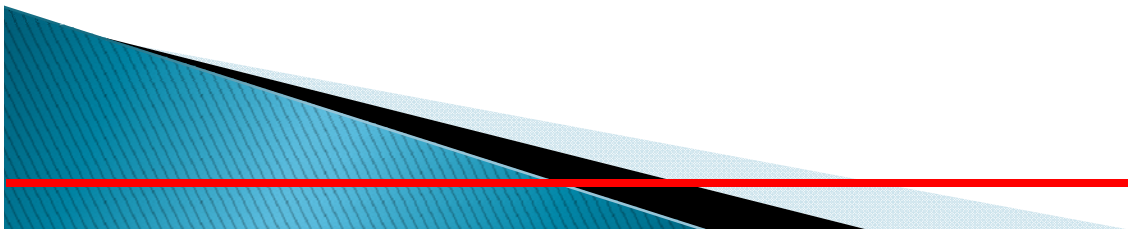
Nepal involvement: process of KP

- ▶ **Deposition** of instrument of accession : 16 Sep. 2005
- ▶ **Entry into force** in Nepal : 14 Dec. 2005
- ▶ **Decision on establishment of DNA** for KP CDM activities : 22 Dec. 2005, MoSTE functions as DNA for Nepal
- ▶ **Steering Committee (SC) formed** : Apr. 2006




Functions & Responsibilities of the DNA

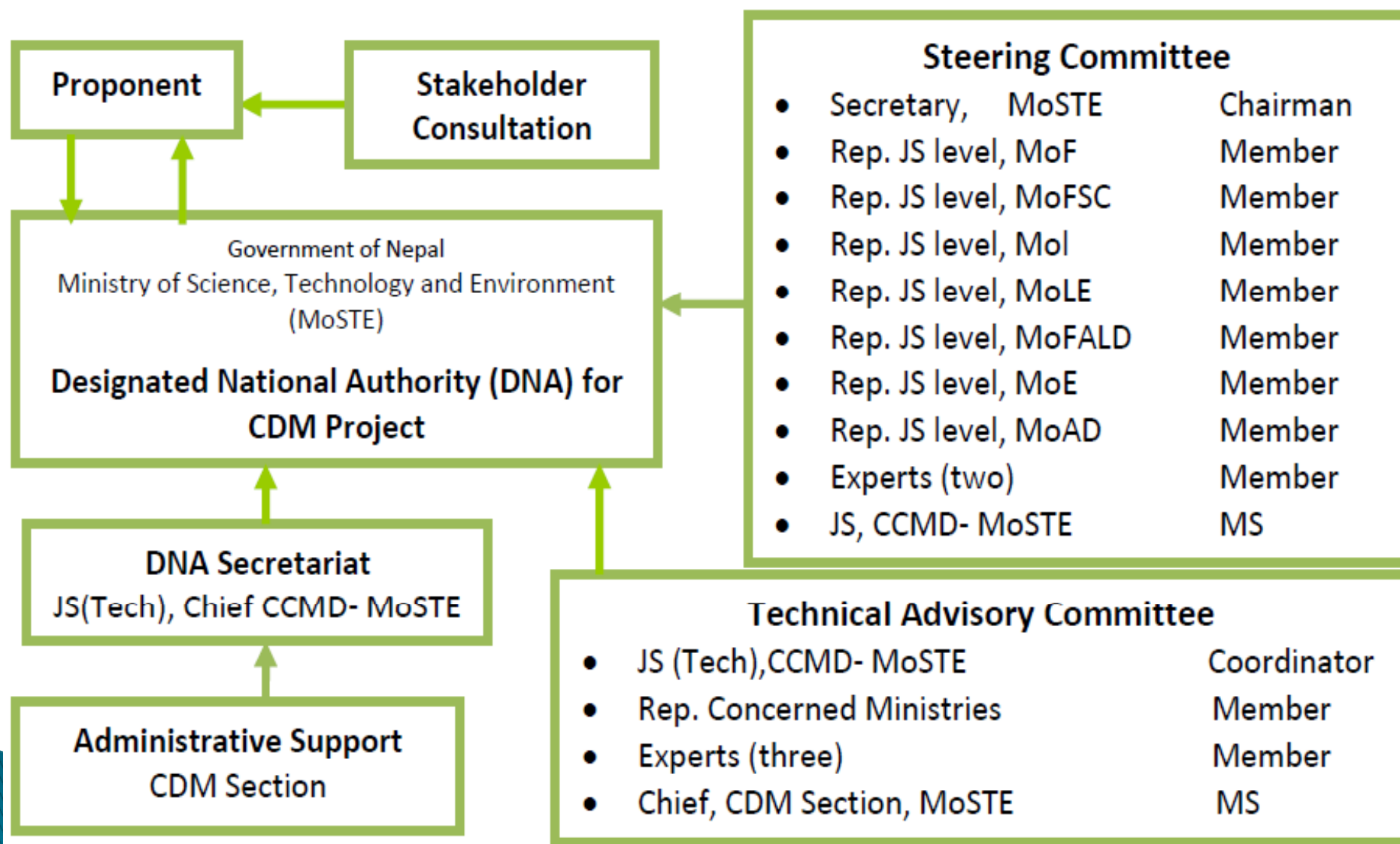
- ▶ Increasing participation of the private sector in CDM projects.
- ▶ Facilitating in developing CDM projects.
- ▶ Managing and coordinating CDM project activities.
- ▶ Providing CDM related information to stakeholders
- ▶ Formulating / implementing strategies and policies to propagate CDM projects.
- ▶ Organizing capacity building and promotional activities to inform people about CDM.



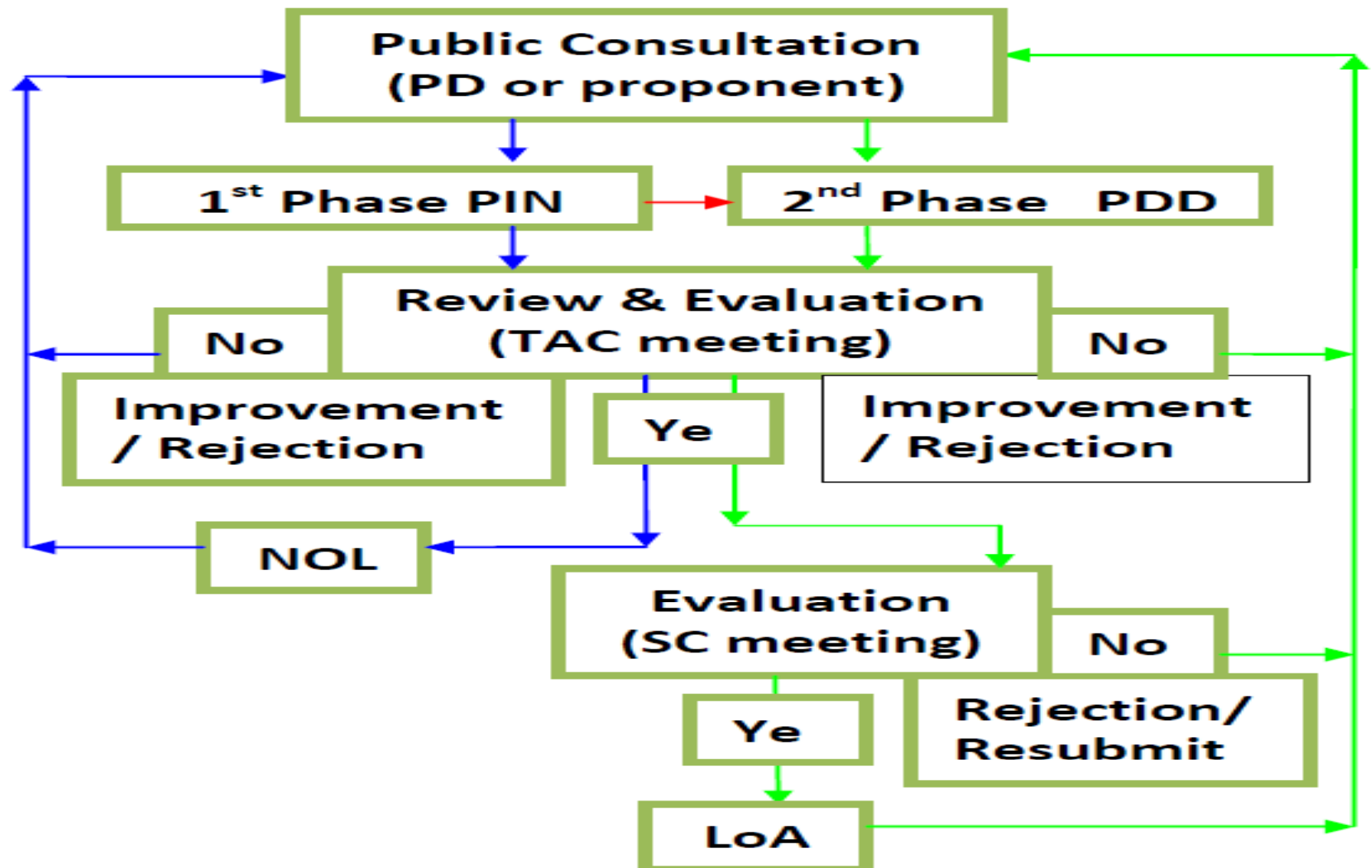
Functions & Responsibilities of the DNA Contd.

- ▶ Supporting the preparation of reference data
 - ▶ Providing comments and inputs of TAC and SC members to PP for improving project report
 - ▶ Issuing NOL for approved PIN and LoA for approved PDD
 - ▶ Monitoring and Evaluation of the CDM Projects
 - ▶ Achieving SD goal through CDM and preparing a status paper on it
 - ▶ Coordinating capacity building, technology transfer and knowledge management for CDM
- 

Review Process and Agencies Involved



CDM Project Approval Cycle



Sustainable Development Criteria

Environmental

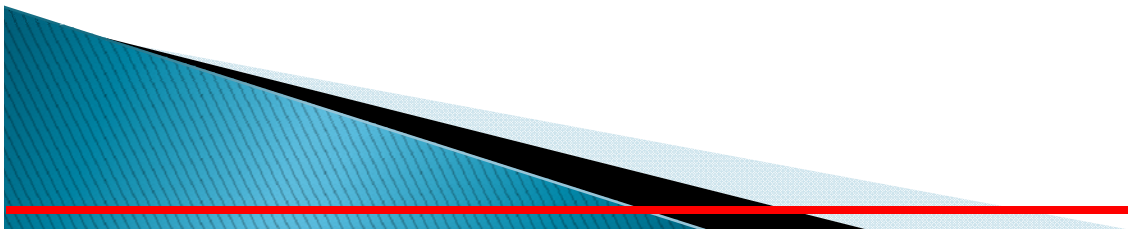
- ▶ **Environmental sustainability** by practicing natural resource conservation or diversification
- ▶ **Improved** health and safety
- ▶ **Reduction** in GHG emissions

Economic

- ▶ **Poverty reduction** and increase in livelihood

Social

- ▶ Local community **participation** in the project
- ▶ **Maintaining** social harmony



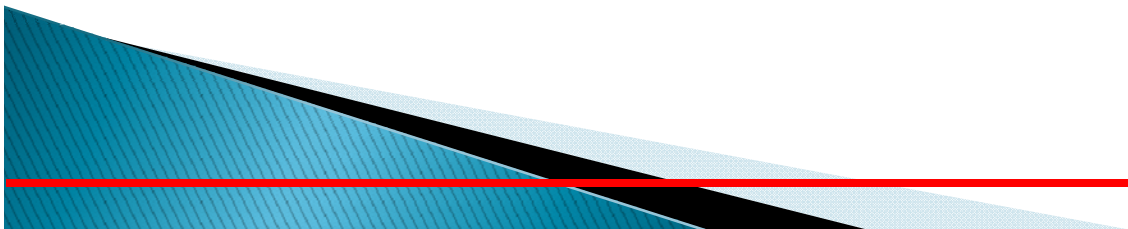
Sustainable Development Criteria

Technology & Capacity building

- ▶ Technology transfer
- ▶ Capacity building at local and national level
- ▶ Address issue of Intellectual Property Right
- ▶ Gender balance and women empowerment

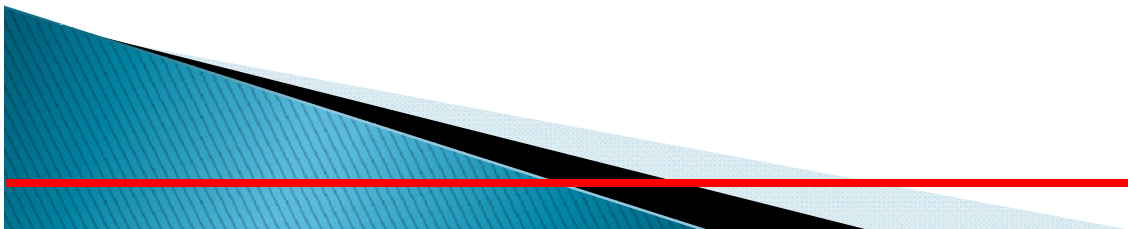
Additional requirements

- ✓ Proofs of consultations, comments and complaints, if any, should be submitted by addressing them during submission of proposal.
- ✓ The Proposed CDM project should comply with existing Law, Strategies and Policies



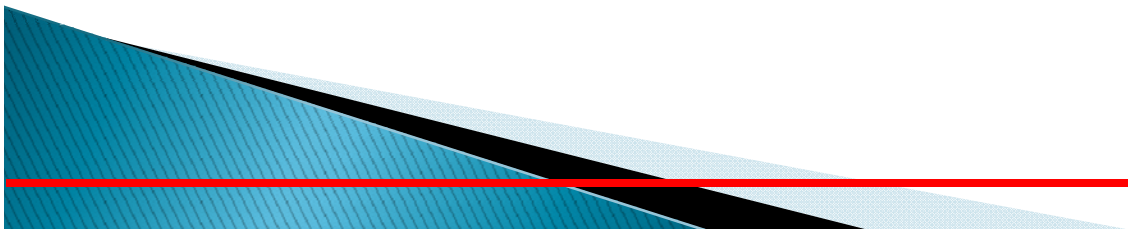
Potential Sectors for CDM Projects

- ▶ Decentralized Renewable Energy –
Micro Hydro, Bio Gas, Solar PV, Improved Cook Stoves, Improved Water Mill
- ▶ Cement and Brick industry
- ▶ Hydropower
- ▶ Energy efficiency
- ▶ Agriculture
- ▶ Forestry



Potential Sectors for CDM Projects

- ▶ Use of wasted heat increasing efficiency
- ▶ Waste to energy
- ▶ Waste water treatment
- ▶ **Transportation**
- ▶ Tourism
- ▶ Clean Energy technology
- ▶ Fuel Switch in industry
- ▶ Modification in Production Process





Thank you

