Global Transport Emission Reduction Campaigns:
Gaps and Opportunities

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OUR AIM

Clean Air Asia leads efforts to enable Asia's

1,000+ CITIES

to reduce both air pollution and CO_2 emissions, and thereby contribute to more livable and healthy cities with blue skies and a low carbon footprint. Emissions can be reduced through policies, plans, programs, and concrete measures that cover air quality, transport and industrial emissions, and energy use.

OUR ROLE

Decision makers use **reliable analysis, knowledge, data and effective tools** to understand the program and identify solutions.

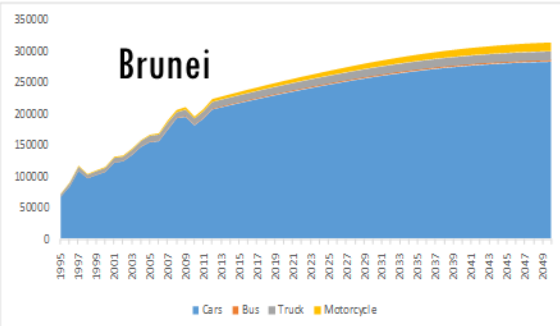
Stakeholders at the city, national and regional level **cooperate better through networks and partnerships.**

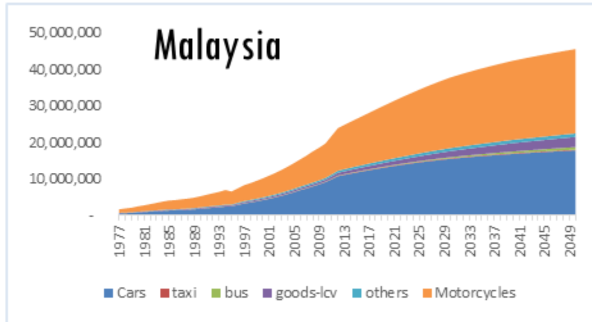
Policies and programs are in place that are **science-based, stakeholder-inclusive and effective.**

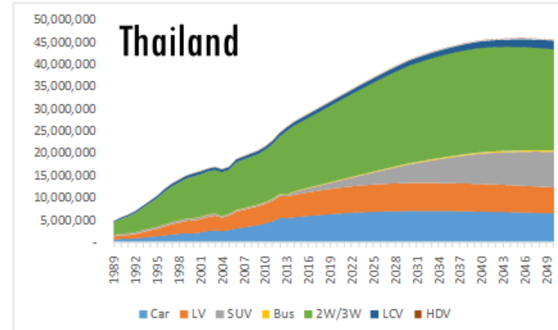
Outline of the Presentation

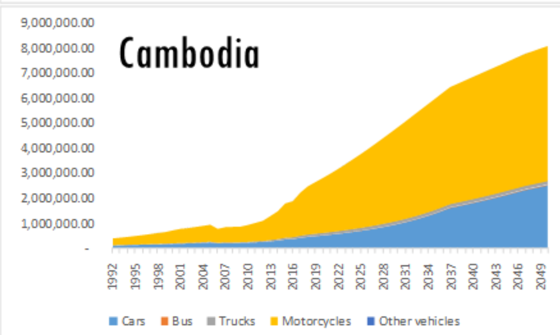
- Background
- Research Objective
- Methodology
- Identified Priority Areas
  - $PM_{2.5}$ and black carbon emissions
  - Emissions from 2- and 3-wheelers
  - Green Freight
  - I/M Programs
  - Secondary markets for outdated vehicles and engines
- Conclusions

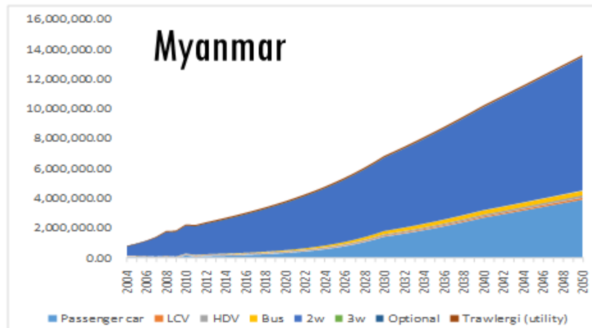
Vehicle Population Growth

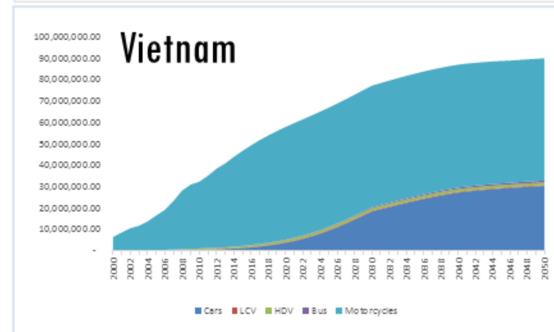


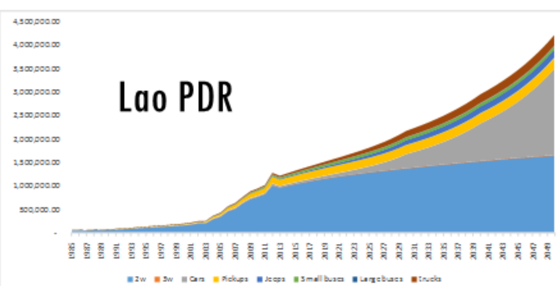


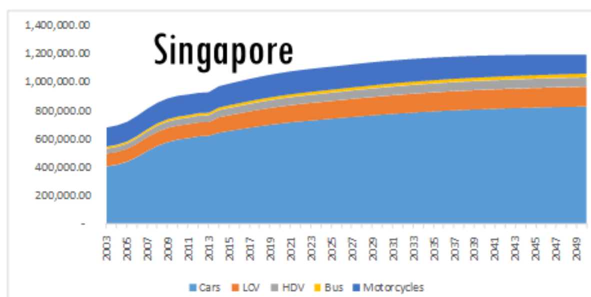










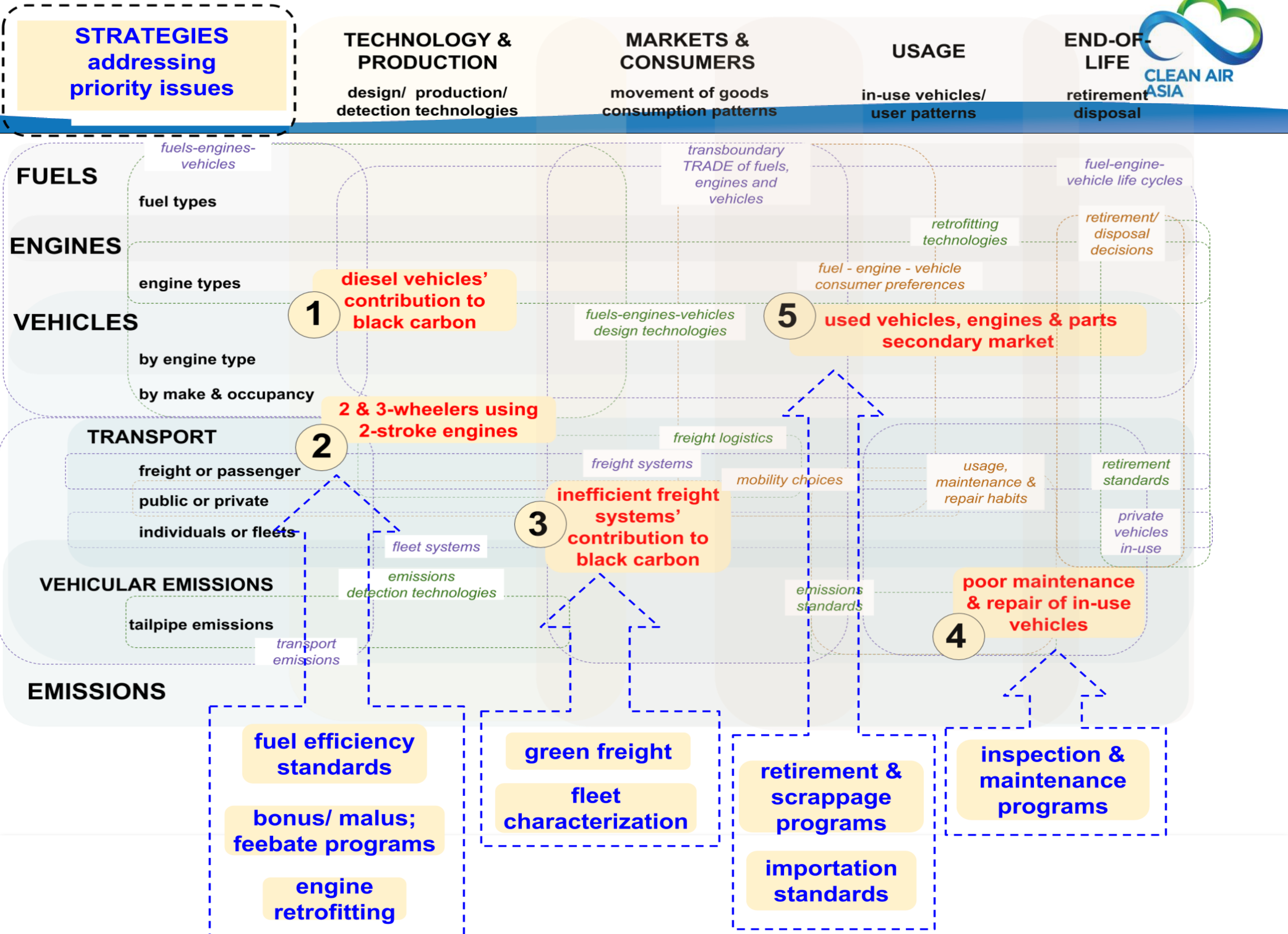


Introduction

- Increases in urban populations in Asia, Africa, and Latin America and the Caribbean are projected to grow by 1.4 billion, 0.9 billion, & 0.2 billion respectively.
- CO_2 emissions from fossil fuel combustion will increase 45% from 2006 to 2030, 97% of this growth will be in non-OECD countries. (IEA, 2011)
- Currently, the transport sector is responsible for 23-24% of global emissions; 17-18% of which are from road transport activities.
- In 2030, the number of motor vehicles on the world's roads is projected to double from its 2010 level – 1.4 billion to 2.8 billion

Objectives

- Provide an overview of transportation emission management initiatives at the global level
  - Identify gaps where future interventions would have significant positive impacts on emission reduction efforts
  - Identify and recommend potential areas for action



STRATEGIES addressing priority issues
TECHNOLOGY & PRODUCTION
design/ production/ detection technologies
MARKETS & CONSUMERS
movement of goods consumption patterns
USAGE
in-use vehicles/ user patterns
END-OF-LIFE
retirement disposal
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fuels-engines-vehicles
transboundary TRADE of fuels, engines and vehicles
fuel-engine-vehicle life cycles
FUELS
fuel types
retrofitting technologies
retirement/ disposal decisions
ENGINES
engine types
fuel - engine - vehicle consumer preferences
1
diesel vehicles' contribution to black carbon
fuels-engines-vehicles design technologies
5
used vehicles, engines & parts secondary market
VEHICLES
by engine type
by make & occupancy
2 & 3-wheelers using 2-stroke engines
2
TRANSPORT
freight logistics
freight or passenger
freight systems
mobility choices
usage, maintenance & repair habits
retirement standards
public or private
individuals or fleets
3
inefficient freight systems' contribution to black carbon
private vehicles in-use
fleet systems
VEHICULAR EMISSIONS
emissions detection technologies
emissions standards
poor maintenance & repair of in-use vehicles
4
tailpipe emissions
transport emissions
EMISSIONS
fuel efficiency standards
bonus/ malus; feebate programs
engine retrofitting
green freight
fleet characterization
retirement & scrappage programs
importation standards
inspection & maintenance programs

RESULTS AND DISCUSSION

$PM_{2.5}$ and Black Carbon Emissions

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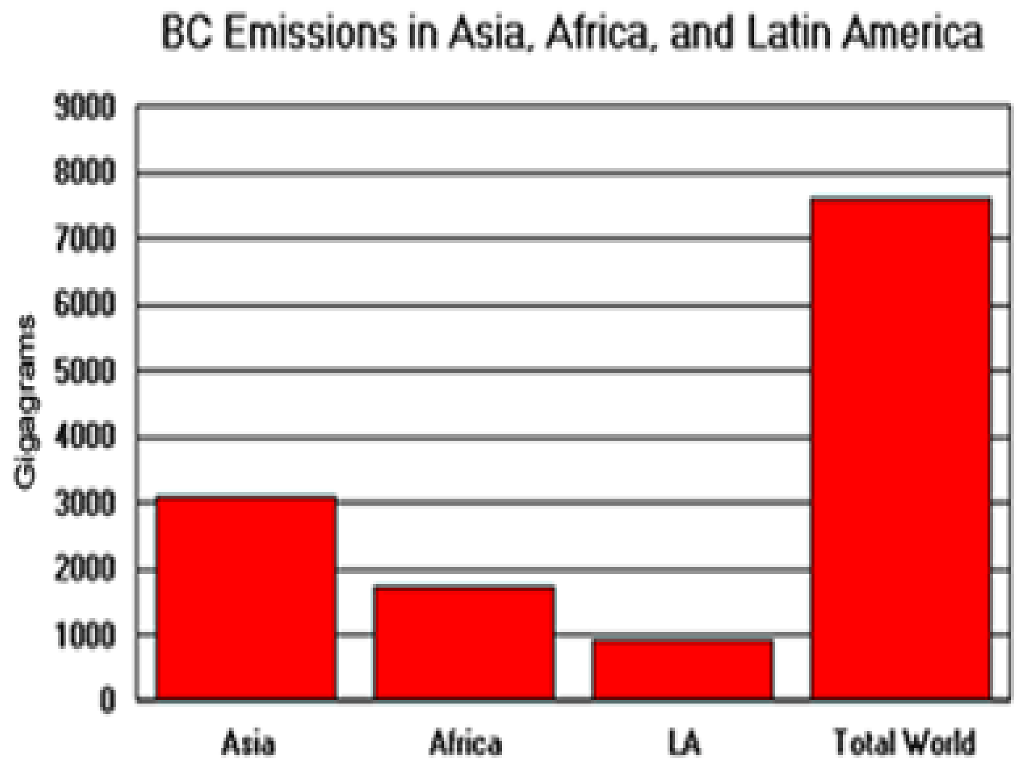
Gaps

- Diesel engines and vehicles are their primary sources in transport
- Exhaust from diesel engines has been identified as a carcinogen by the WHO
- Asia accounts for the bulk of $PM_{2.5}$ and BC emissions
- Lack of or ineffective implementation of more stringent fuel & vehicle standards to address this



Source: http://www.epa.gov/blackcarbon/basic.html

$PM_{2.5}$ and Black Carbon Emissions *Opportunities*

- Implementation of more stringent fuel and vehicle standards, where these are established; enactment of tighter standards, where they are not for new vehicles
- Implementation of incremental technology improvements to in-use vehicles to complement stringent standards
- Exploration and promotion of alternative fuels & hybridization
- Curbing emissions will result in co-benefits (climate change mitigation) and improved public health

Emissions from Two- and three-wheelers

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Gaps

- Increase in the number of motorcycles and percentage share in total vehicle fleet
- This increase is unaccompanied by stringent standards and/or technologies to curb emissions

Opportunities

- Strengthen campaigns and initiatives that retrofit old engines, introduce alternative fuels and vehicles (e.g. e-tricycles)
- Feebate-rebate programs

Green Freight

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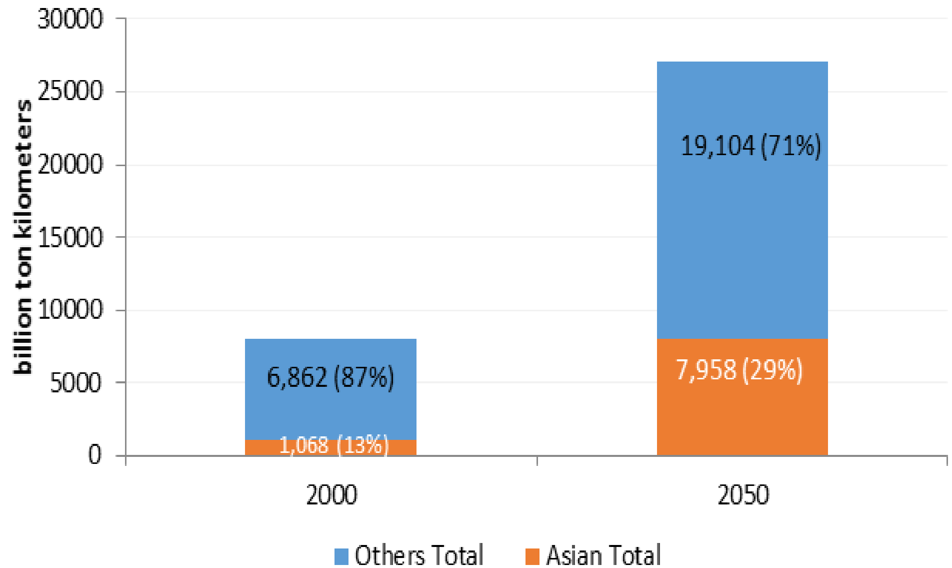
Gaps

- Medium- and heavy-duty vehicles, comprise a small percentage (less than 10%) in total vehicle fleet but account for majority (more than 50%) of total CO_2 emissions from the sector
- Lack of policies that address emissions from road freight
- Sector fragmentation; lack/unavailability of data to support and measure initiatives

(Projected) travel activity of trucks in Asia



Source: Clean Air Asia, 2012

Green Freight

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Opportunities

- A number of successful pilot projects that can be scaled up and replicated at the national and/or regional levels
- Regional initiatives (e.g. GFA, Green Freight Europe, Smartway) to streamline activities and operations

Inspection & Maintenance Programs

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Gaps

- National governments' lack of resources and capacity to conduct and oversee I/M operations
- Decentralized I/M systems leave much room for rent-seeking behavior
- Ineffective enforcement

Opportunities

- Complementation of existing programs with existing standards
- Packaging incentives in a manner relevant to key stakeholders
- Awareness raising campaigns

Migration & continued use of outdated vehicles and engines

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Gaps

- Lack of policies that address vehicle and engine scrappage certification
- Vehicles with technologies deemed obsolete are transferred to areas with less stringent standards
- Gap in international and regional export/importation standards & transboundary movement of retired vehicles

Opportunities

- Concerted action at the regional and international levels; e.g. a global campaign **on emission standards for imported second-hand vehicles** to raise the awareness on the issue

Conclusions

- Fuels and vehicles comprise a system and campaigns need to be cognizant of the interconnectivity of issues and potential benefits.
  - Curbing $PM_{2.5}$ and black carbon emissions from diesel engines cuts across other priority issues: green (road) freight, emissions from two- and three-wheelers, and stringent standards for imported second-hand vehicles

Conclusions

- Policies and standards, when effectively implemented, strengthen/contribute to the success of existing programs
  - I/M programs need to be backed up by stringent standards and efficient and effective systems of implementation
  - Technologies (e.g. DPFs) to reduce emissions from in-use vehicles can only be used when sulfur content in fuels are significantly low

For more information: www.cleanairasia.org

BAQ
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sri lanka
19-21 November 2014

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ASIAN CLEAN FUELS ASSOCIATION

245 Clean Air Asia Partnership Members

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- Environment ministries and government agencies
- Development agencies and foundations
- Non-government organizations
- Academic and research institutions
- Private sector companies and associations

Donors in 2012 to 2013

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