Financing Urban Transportation in Asia: Importance of Carbon Financing in Achieving SUT and AQM

Bert Fabian, Transport Unit Head
Cornie Huizenga, Executive Director
CAI-Asia Center

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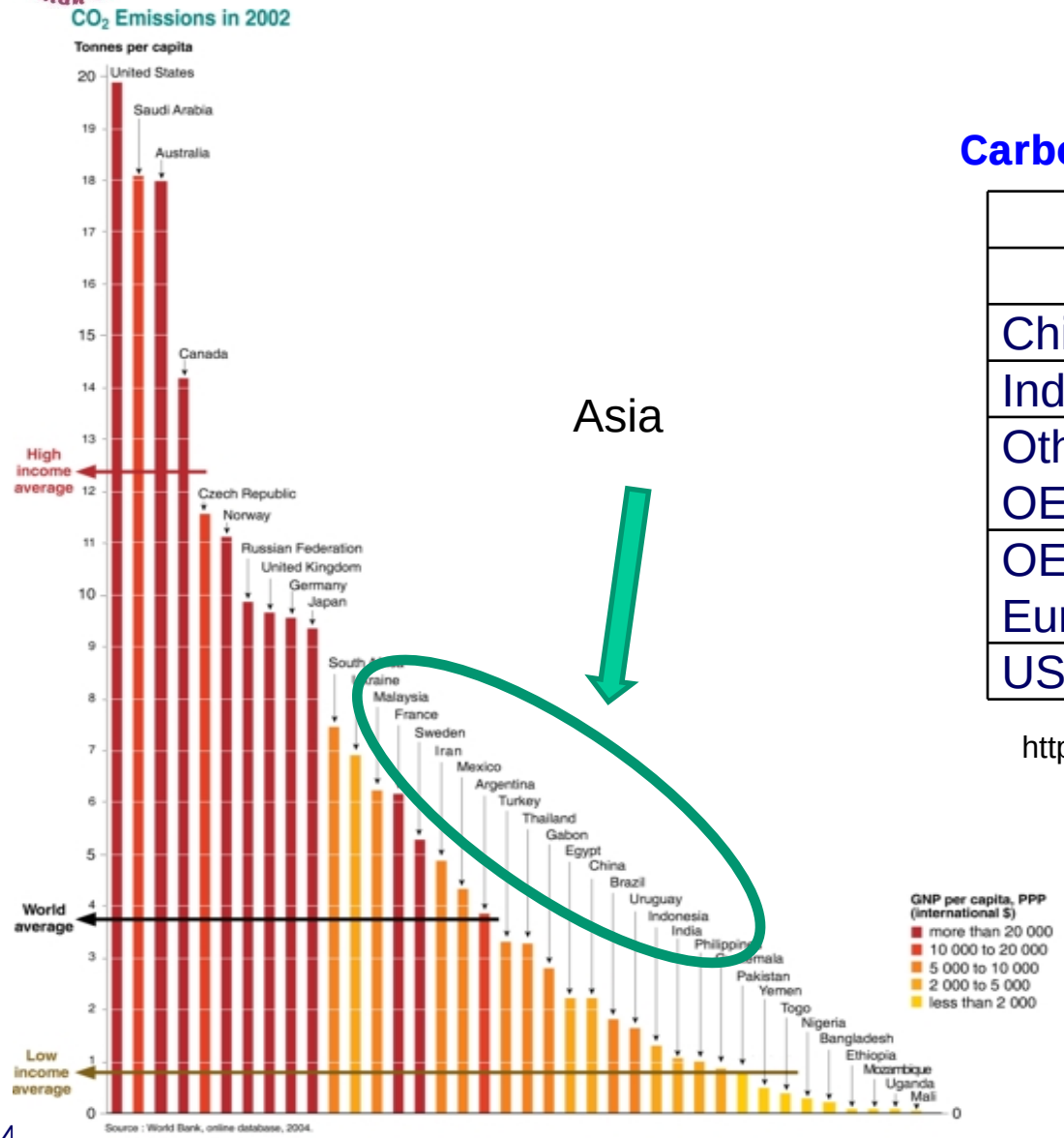
Outline

- CO_2 and the transport sector
- Carbon financing and the transport sector in Asia
- Role of carbon financing in Asia to reduce GHG emissions from the transport sector

Part 1: CO_2 emissions and the transport sector in Asia

Trends – CO_2 emissions



Asia

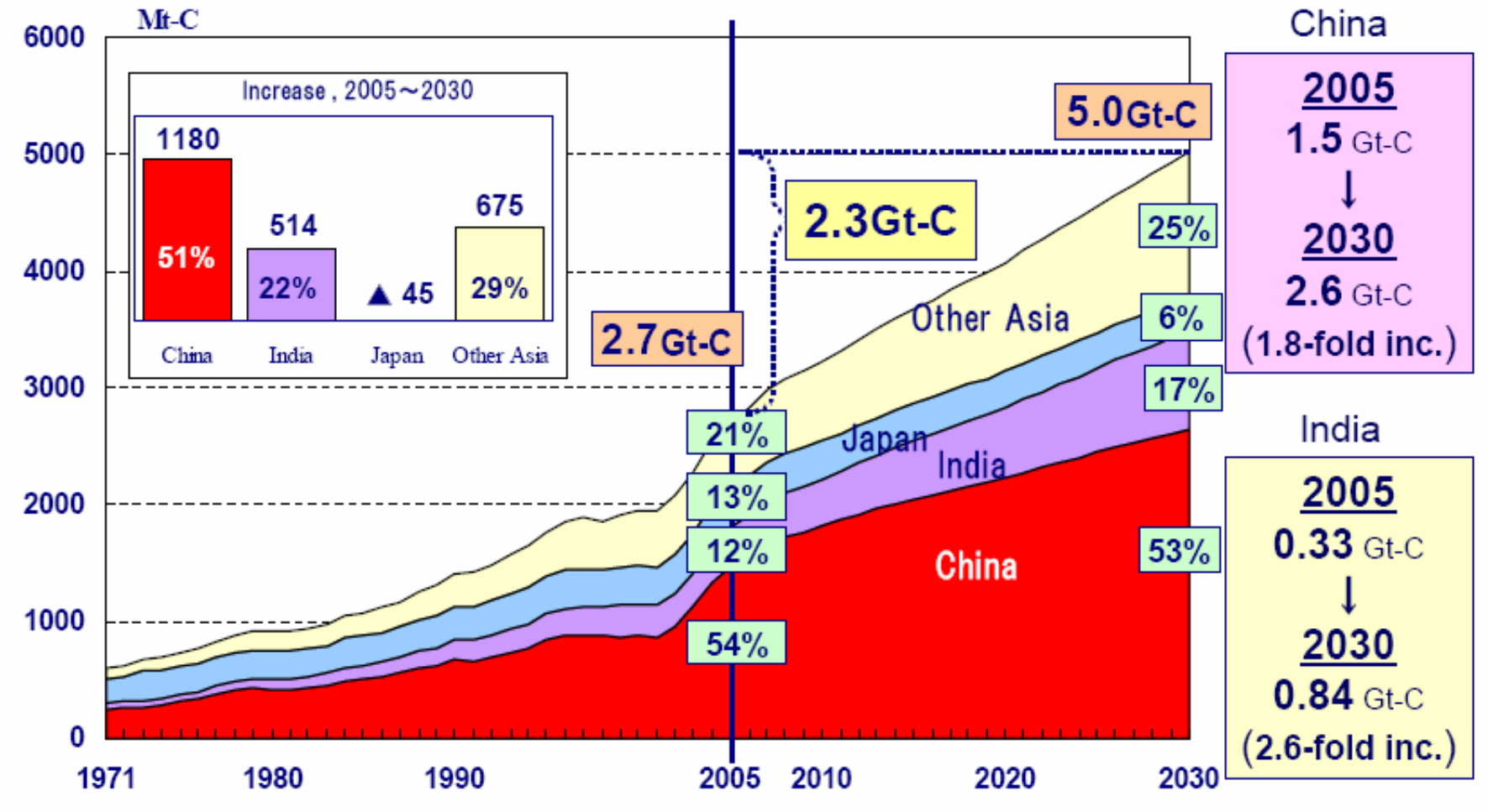
Carbon emissions per capita (2002)

	Tons per capita	
	2004	2030
China	3.6	7.8
India	1.0	1.5
Other non-OECD	1.7	2.4
OECD-Europe	8.2	8.3
US	20.1	21.8

http://www.eia.doe.gov/oiaf/ieo/emissions.html

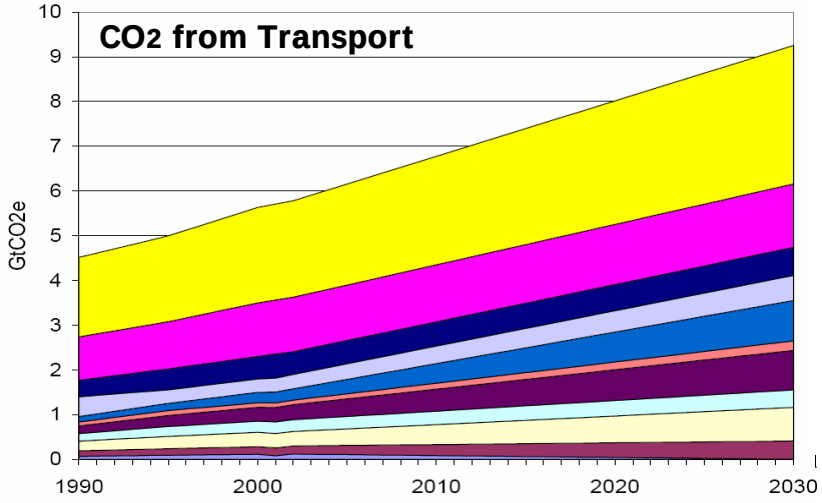
http://maps.grida.no/library/files/web_national_carbon_dioxide_co2_emissions_per_capita.jpg

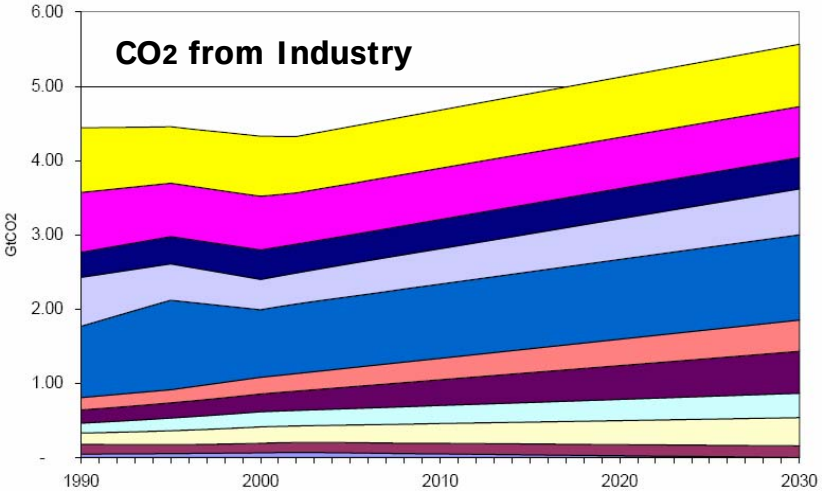
CO_2 Projections in Asia

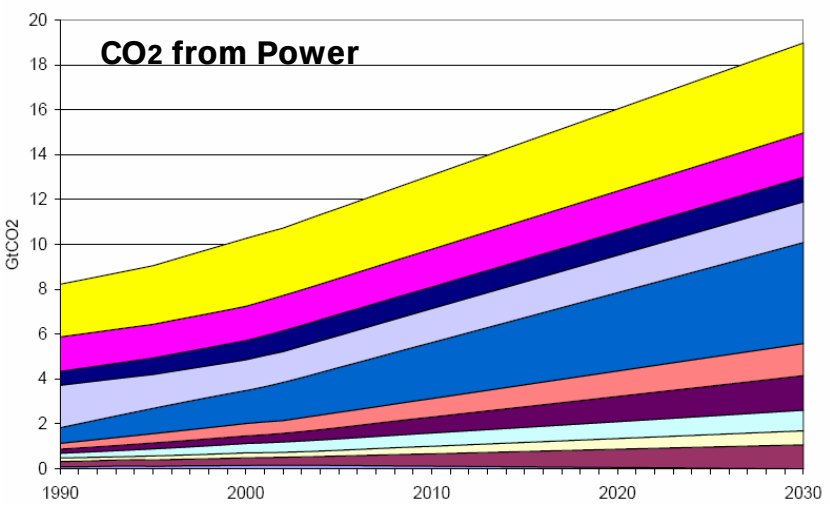


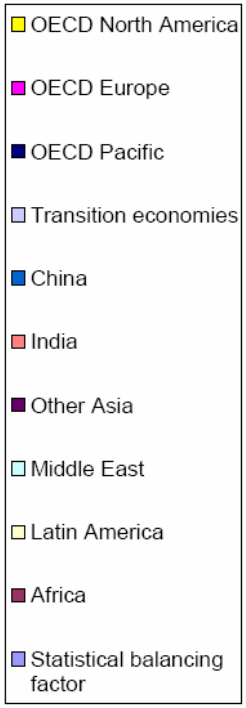
Source: Institute of Energy Economics, Japan. 2007. Asia/World Energy Outlook 2007.

CO_2 Emissions: Sectors





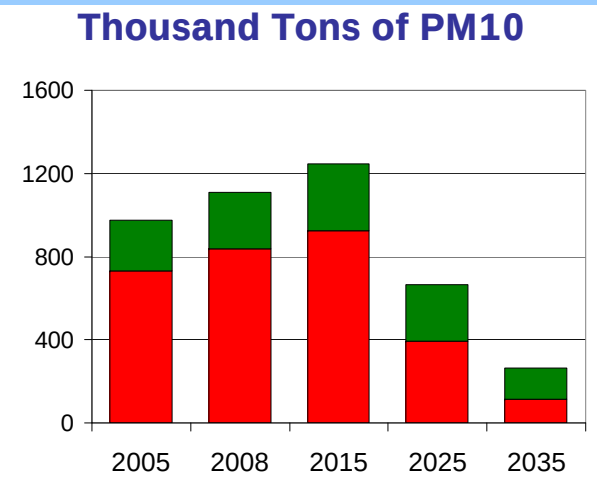


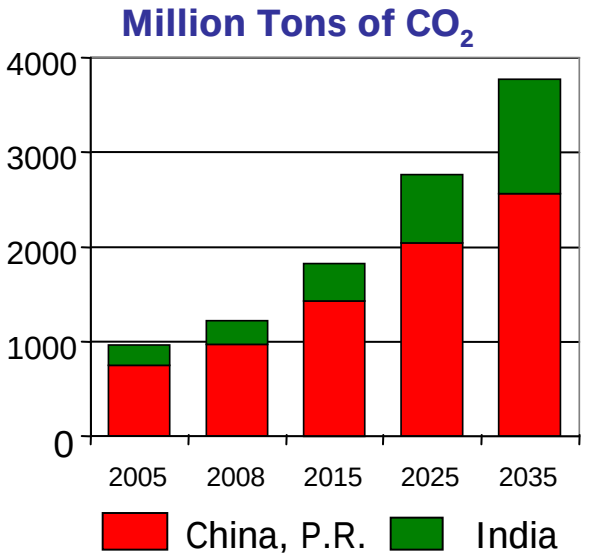


Source: HM Treasury. Stern Review on the Economics of Climate Change

Trends in urban transport and their emissions

- Transport sector is the fastest growing source of CO_2 emissions
- Global transport related emissions rising by 2.5% per year, in South even by 4.4%
- Doubling of urban population in South by 2030 expected, resulting to an exploding demand for mobility in Asian cities
- Re-orienting transport trends in Southern countries pose a huge challenge for climate protection





Source: Dalkmann, et.al. 2007. JIKO Transport Policy Paper

Source: ADB/ CAI-Asia, 2006

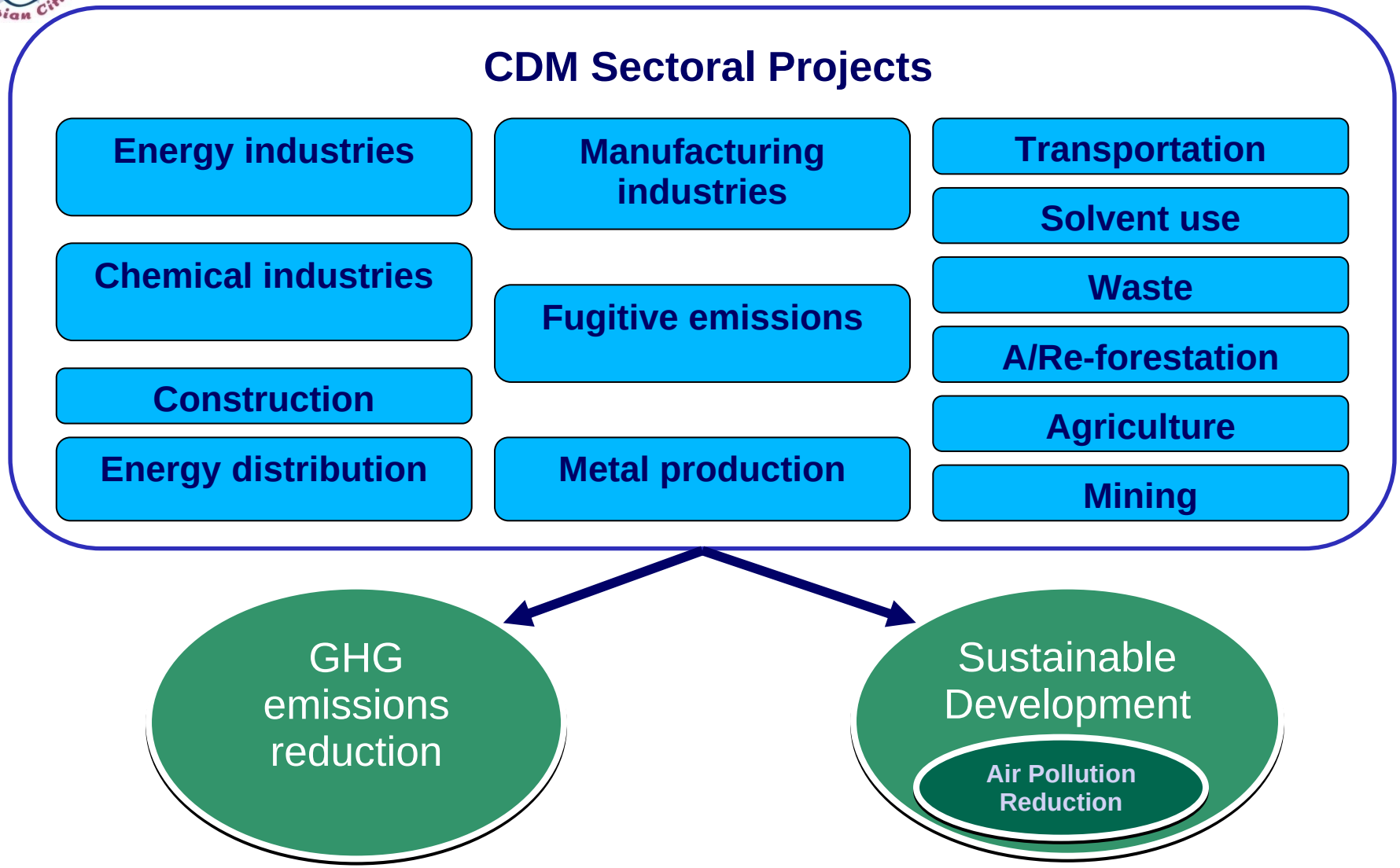
Transport options to reduce CO_2

	CO_2 ↓	$ Costs
Reduce emissions per kilometer		
Technology/ vehicle change	+	Low
Behavioral change (e.g. Fleet management, driver's training)	+	Low
Fuel-switch (e.g. gas to CNG/LPG, to biofuels)	?	?
Reduce emissions per unit transported		
Passenger transport:		
Mode switch	++	low-medium
Usage of larger units	+	low
Improved occupation rates	++	low
Freight transport	++	++
Reduce number of trips		
Land-use – Behavioral change	+++	? - high
TDM	+++	? - medium

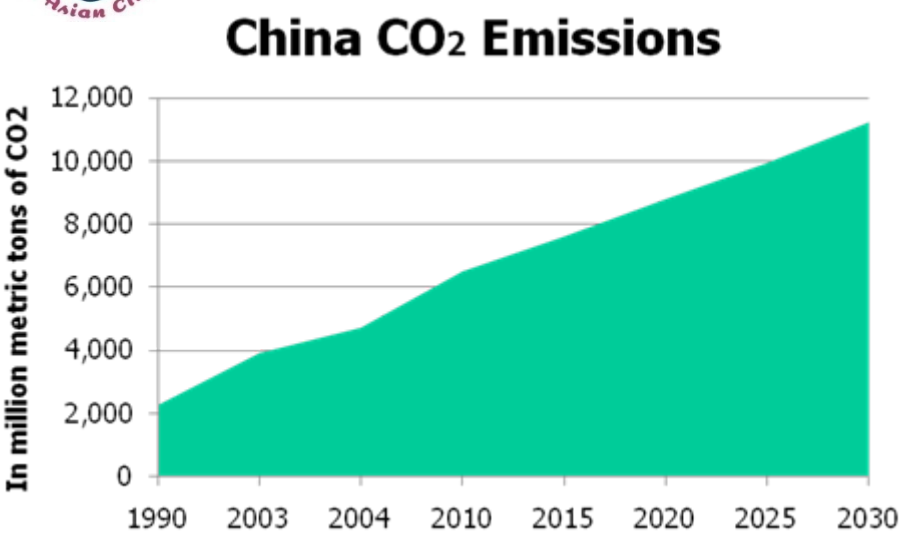
Source: Authors, adopted from GTZ, 2007

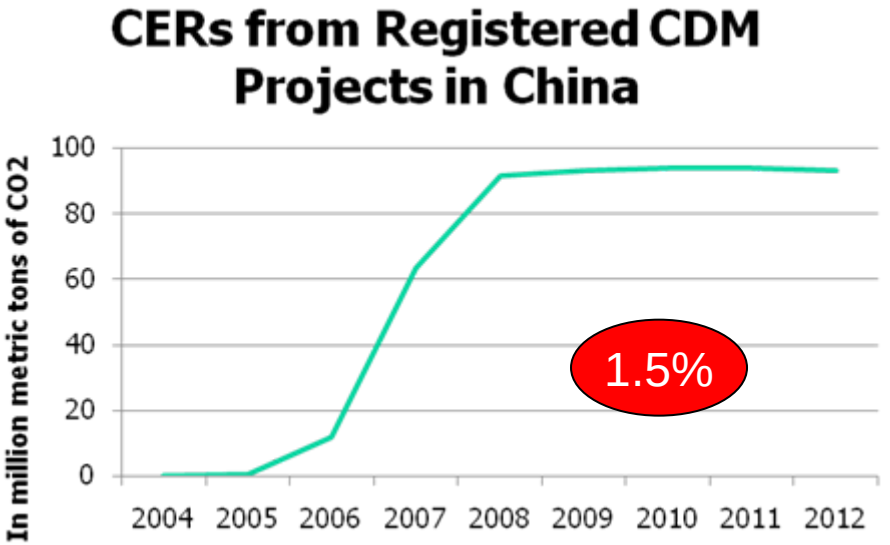
Part 2: CDM in the transport sector: case study of Bus Rapid Transit (BRT)

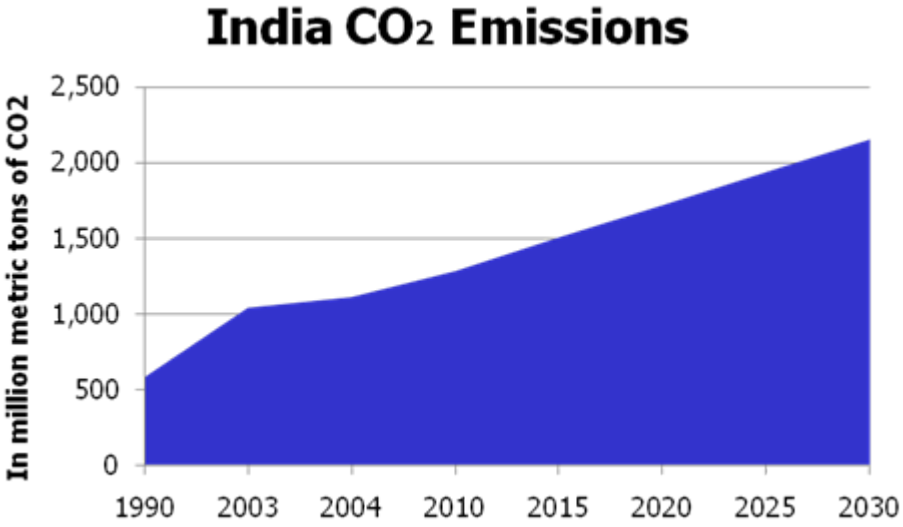
Air Quality and CDM link

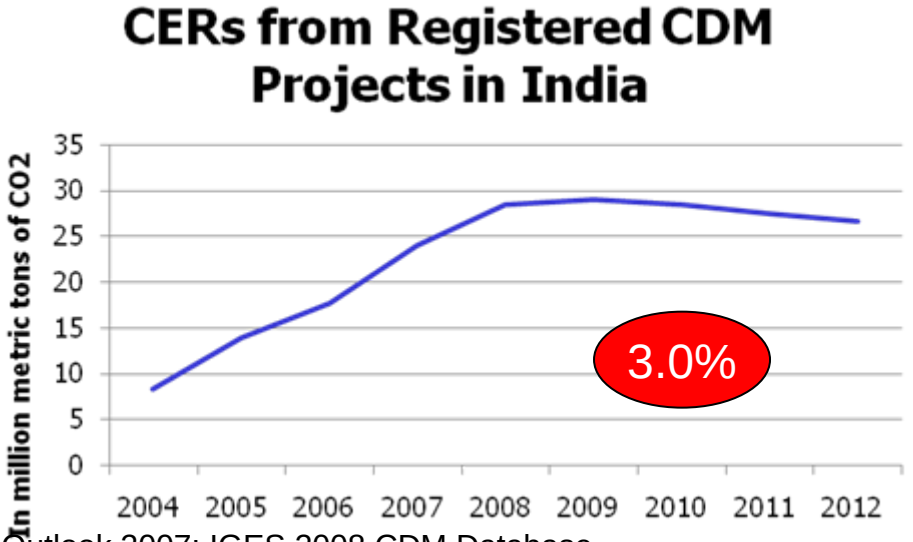


CO_2 Emissions vs CERs





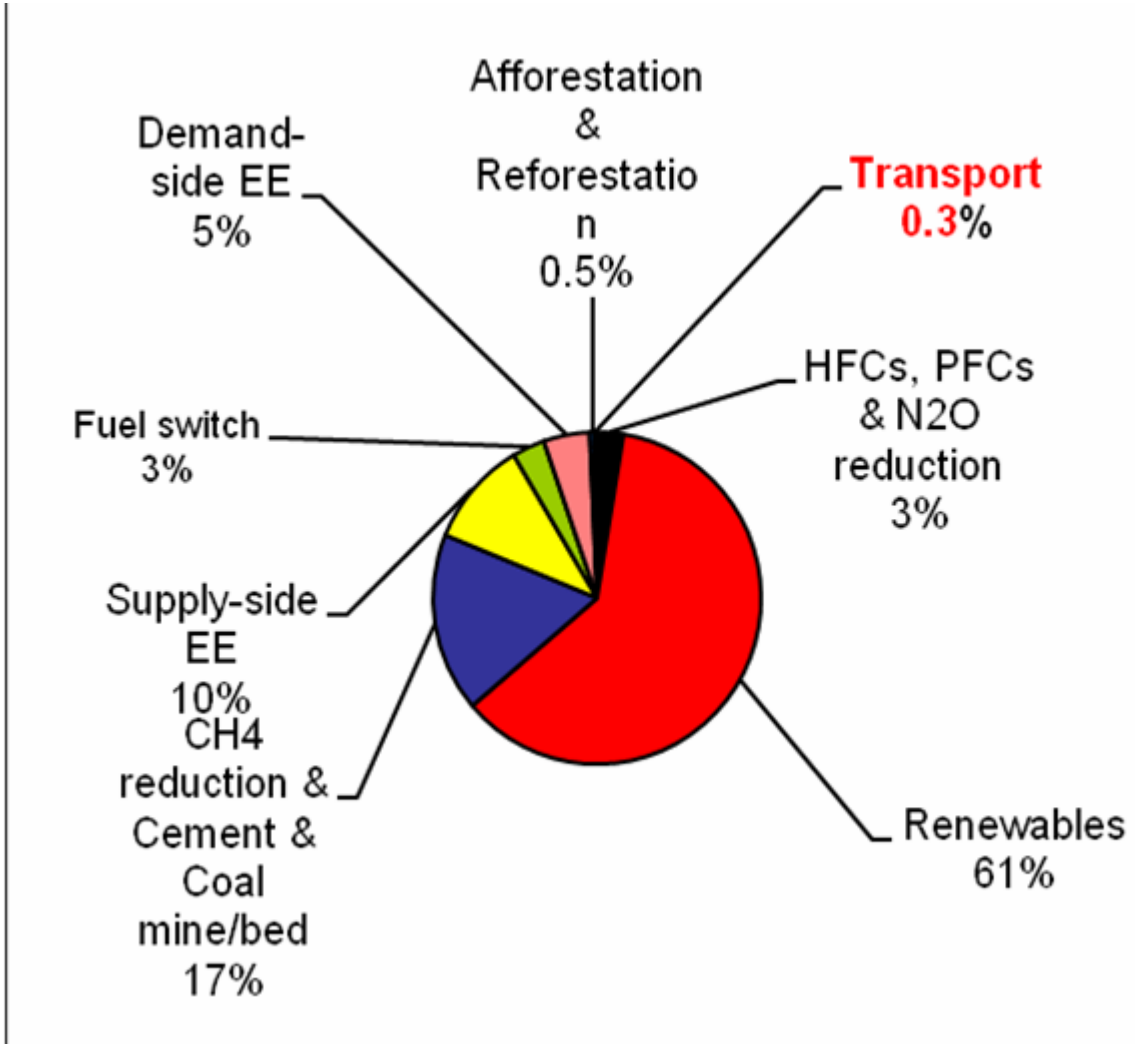




Source: Energy Information Administration. International Energy Outlook 2007; IGES 2008 CDM Database

CDM pipeline projects

2783 CDM projects in the pipeline



Source: UNEP Risoe. CDM Pipeline

BRTs in Asia* - potential for carbon financing?

Systems in operation (17):

Akita, Japan
Ankara, Turkey
Beijing, China
Fukuoka, Japan
Gifu, Japan
Hangzhou, China
Jakarta, Indonesia
Kanazuwa, Japan
Kunming, China
Miyazaki, Japan
Nagaoka, Japan
Nagoya, Japan
Nigata, Japan
Pune, India
Seoul, South Korea
Shijiazhuang, China
Taipei,China

Systems in planning or under construction (37):

Ahmedabad, India
Bangalore, India
Bangkok, Thailand
Bhopal, India
Chiang Mai, Thailand
Chengdu, China
Chongqing, China
Colombo, Sri-Lanka
Delhi, India
Guangzhou, China
Huai'an, China
Hyderabad, India
Incheon, South Korea
Indore, India
Jaipur, India
Jinan, China
Karachi, Pakistan
Makati City, Philippines
Metro Manila, Philippines
Metro Cebu, Philippines
Mysore, India
Pimpri-Chinchwad, India
Rajkot, India
Shanghai, China
Shenyang, China
Shenzhen, China
Surabaya, Indonesia
Surat, India
T'aichung, China
T'ainan, China
Tienjing, China
Wuhan, China
Wuxi, China
Vijaywada, India
Vishakhapatnam, India
Xi'an, China
Xiamen, China

*As of 26 December 2007

Will BRTs prosper under the CDM?

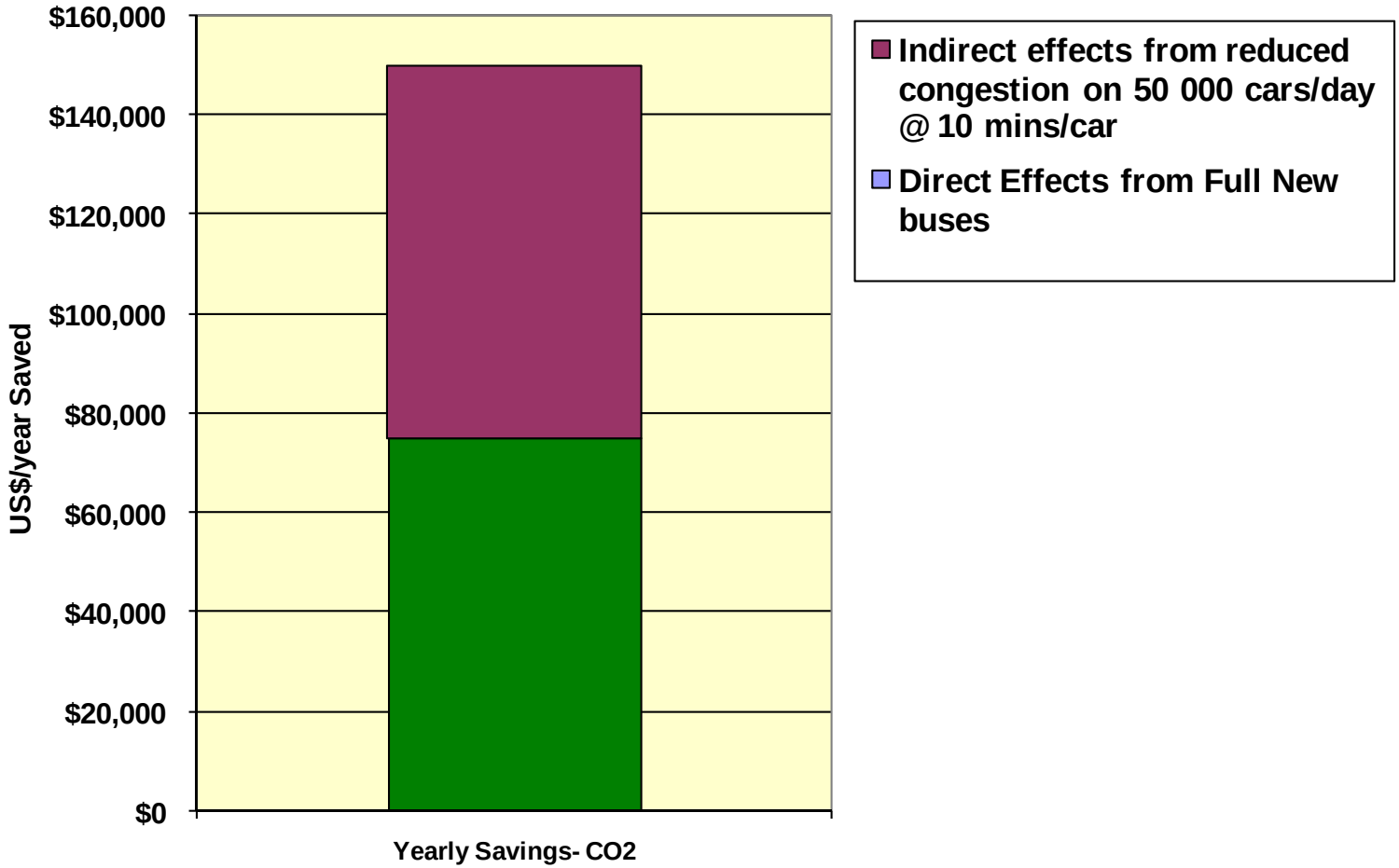
- Limited applicability of current methodology
- High complexity and long gestation time
- Low carbon revenues
  - Transmilenio (Bogota BRT) annual CERs: 246,563
- Estimation and monitoring of CO2 reductions
  - 27 formulas for ex-ante estimation of CO2 reductions
- Development of new methodologies will result to additional costs and time

http://www.winnipegrapidtransit.ca/Images/photo_transmilenio_danielsson.jpg

(Sources: Winkelman 2006, Dhakal 2006)

Application of Cobenefits Approach in Bus Rapid Transit (BRT) (1)

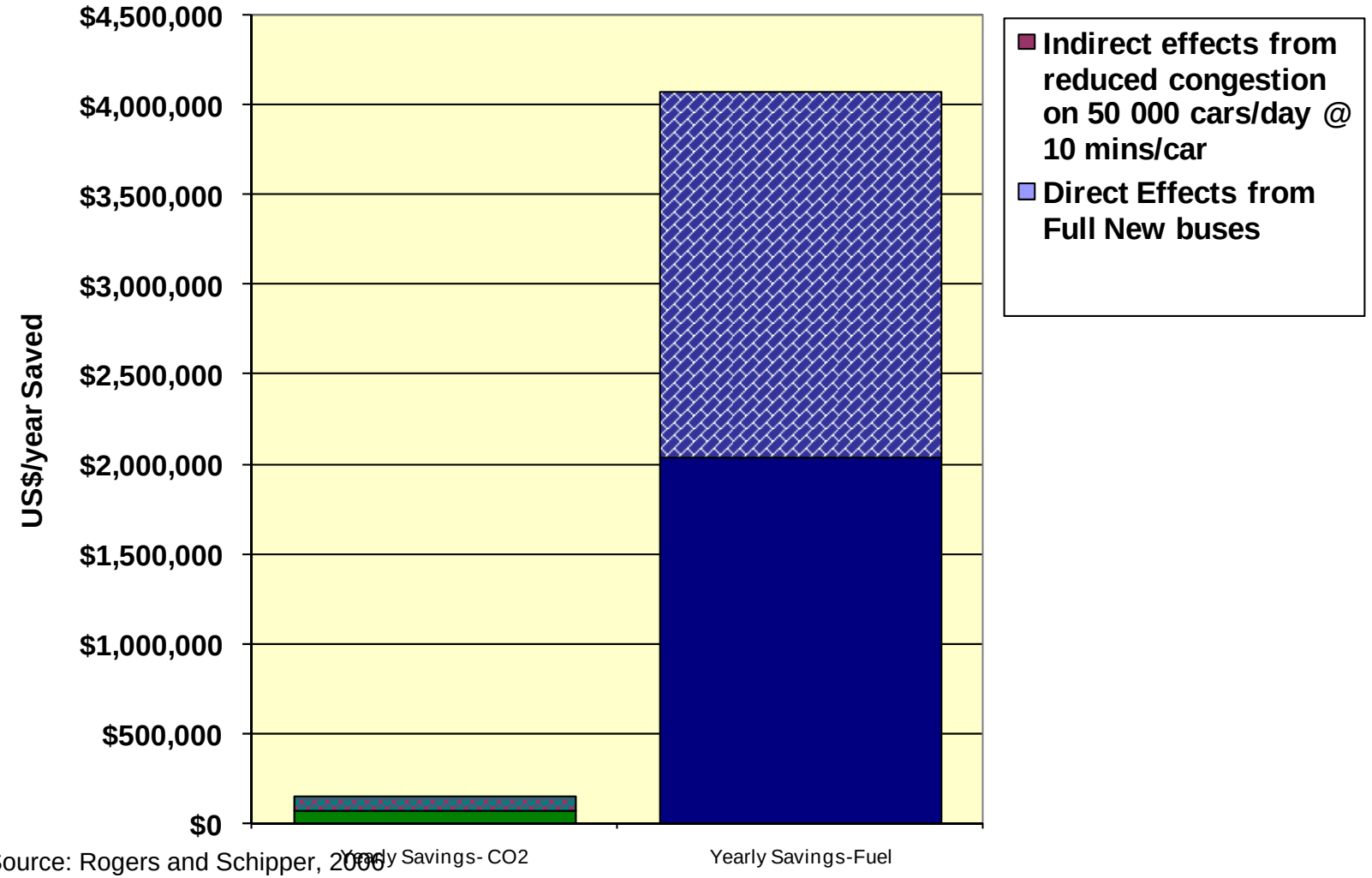
GHG Savings at $5/Tonne: Hypothetical Corridor



Source: Rogers and Schipper, 2006

Application of Cobenefits Approach in BRT (2)

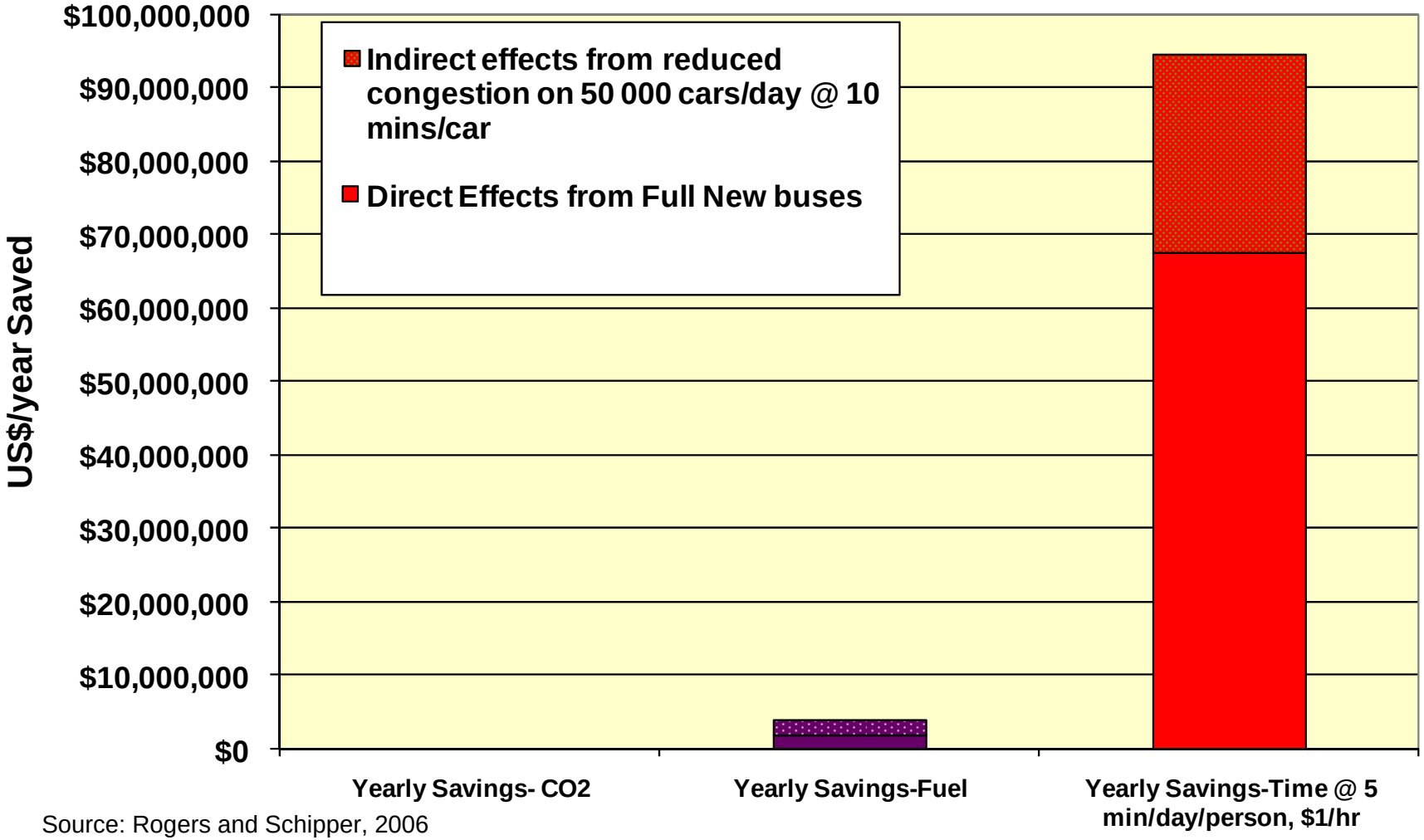
GHG, Fuel Savings ($340 / tonne): Hypothetical Corridor



Source: Rogers and Schipper, 2008

Application of Cobenefits Approach in BRT (3)

GHG, Fuel, Time ($1/hour) Savings Corridor Bus Passengers, car drivers



Source: Rogers and Schipper, 2006

Part 3: Role of carbon financing in Asia to reduce GHG emissions from the transport sector

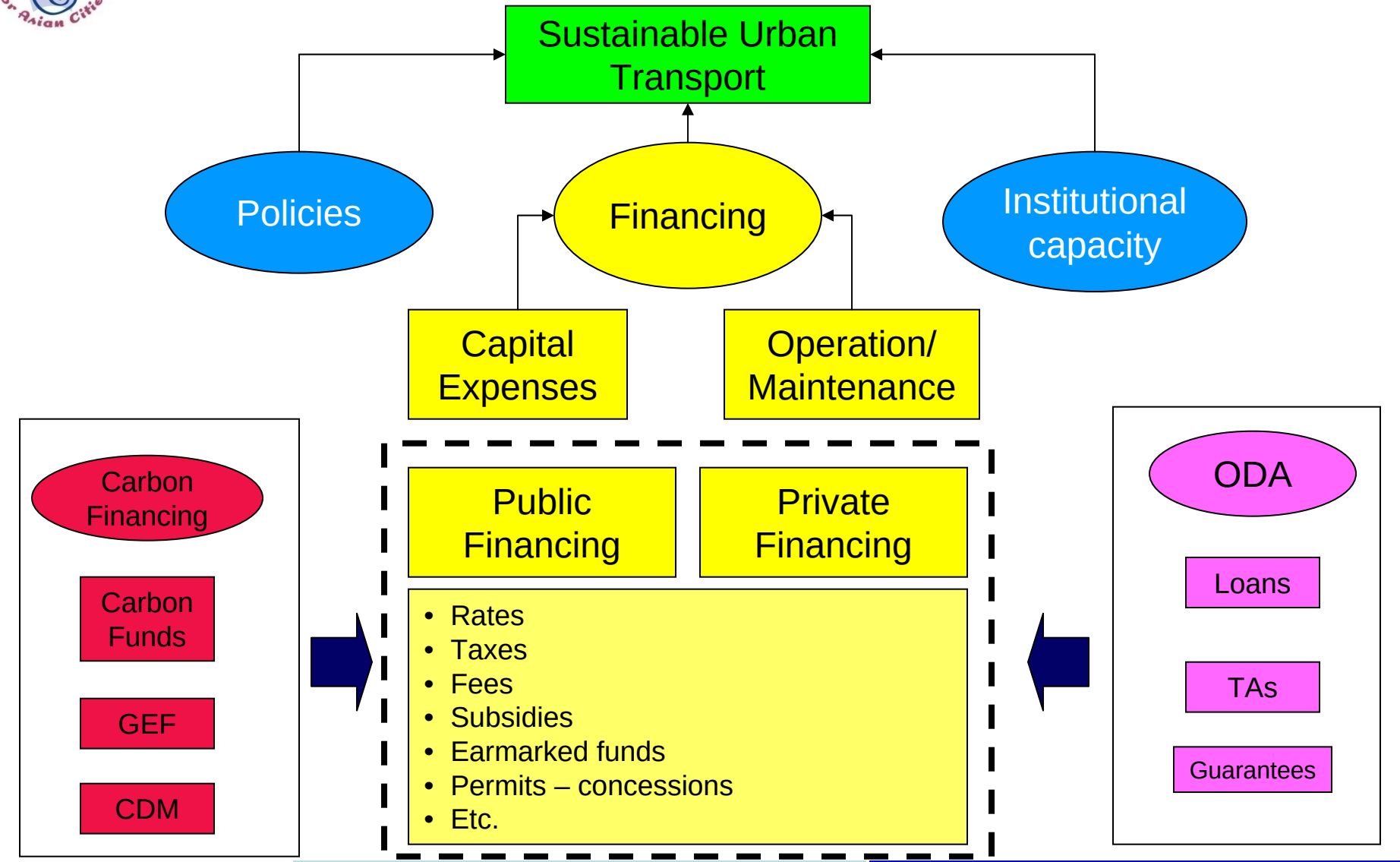
Assumptions (1)

- Urban transport in Asia will require massive investments in the next 20 years
- Current institutional and financial mechanism in developing countries is biased towards promoting private transport rather than public and non-motorized transport
- Sustainable urban transport:
  - Socially sustainable: affordable to all
  - Environmentally sustainable: clean and green (air quality and GHGs)
  - Economically and financially sustainable: enough resources to construct and operate at required scale
- Financing is one of the needs to promote and achieve SUT
- Other important factors are policies and institutional capacity

Assumptions (2)

- Need to analyze current financing mechanisms for urban transportation in developing countries
  - LGUs depend on national budget appropriations?
  - Funds mostly used for road expansion and maintenance?
- Need to quantify financing for SUT based on MDGs and Climate Scenarios to ensure that proposed financing mechanisms are able to generate adequate amounts of funding at the right time.
- Bulk of financing for SUT will have to come from public and private sector in developing countries.
- External funding e.g. ODA and carbon funding can catalyze/support/facilitate local funding -- this will be more effective if it is sector or policy based rather than project base

"Zero" Conceptual Framework



Need for a concerted effort to push SUT financing: CAI-Asia Center Plans and Activities

- December 2007: Bali COP 13: decision to set up a working group
- January: presentation draft ToR Working Group and the creation of the Financing SUT Working Group in a meeting on Sustainable Transport and Carbon Finance, co-hosted by the Clean Air Institute(CAI-LAC) and the World Bank
- February: creation of new Google discussion group
- November: presentation of ideas at BAQ 2008 pre-event in Bangkok, Thailand
- December Presentation of results WG at side-event at COP 14 in Poznan, Poland

Future discussion on carbon financing

- Does it encourage policy change?
- Does it have an in-build mechanism for replication and scaling-up?

"Asia has about 2500 cities of 100.000 people and above. Many/most of these cities will make investment decisions on transport in the next 5 years which will greatly influence the sector's emissions in the next 30 years. Only if we are able to influence majority of these investment decisions can we say we have a successful approach."

Interested in the discussions?

- Join the Financing SUT Working Group http://groups.google.com/group/sut-carbon-finance-wg/web/welcome-to-the-financing-sut-wg
- Send an e-mail to:
  - bert.fabian@cai-asia.org
  - jorge.mtz.cjos@gmail.com