

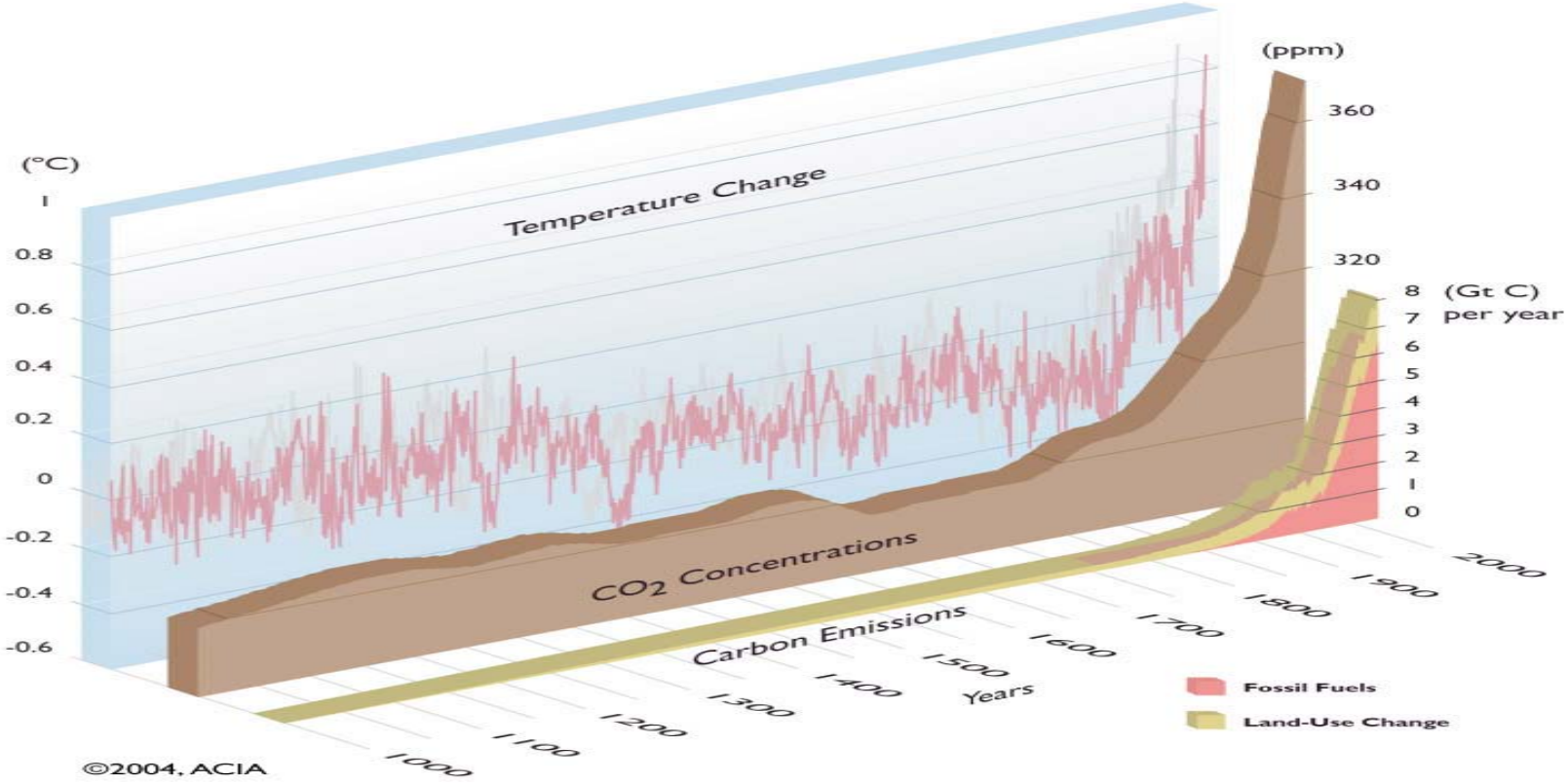
CLIMATE CHANGE MITIGATION IN THE TRANSPORT SECTOR IN ASIA



Charles M. Melhuish
Acting Chief Executive
global Transport Knowledge Partnership



Global Warming is a Reality

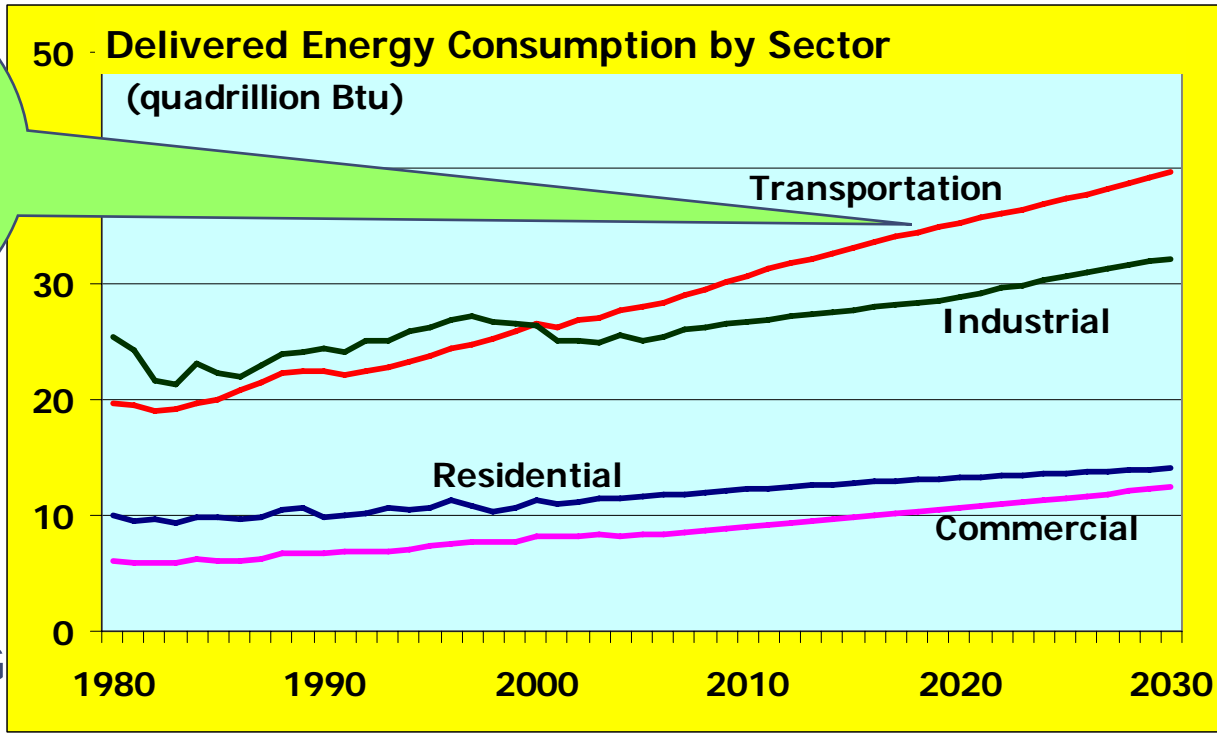


CO2 levels have never been higher during at least the last 420,000 years

Transport's Contribution to Climate Change

Transport is the fastest growing energy use sector

Transport is responsible for 60% of the increase in total world-wide GHG emissions 2002-2025



Asian Context

Half of the planet lives in Asia

- Additional 750 million by 2030
- 4 billion in 2030 (50% of world total)

Increasing Urbanization (2000–2025)

- China 81% growth of urban population
- India 87% growth of urban population

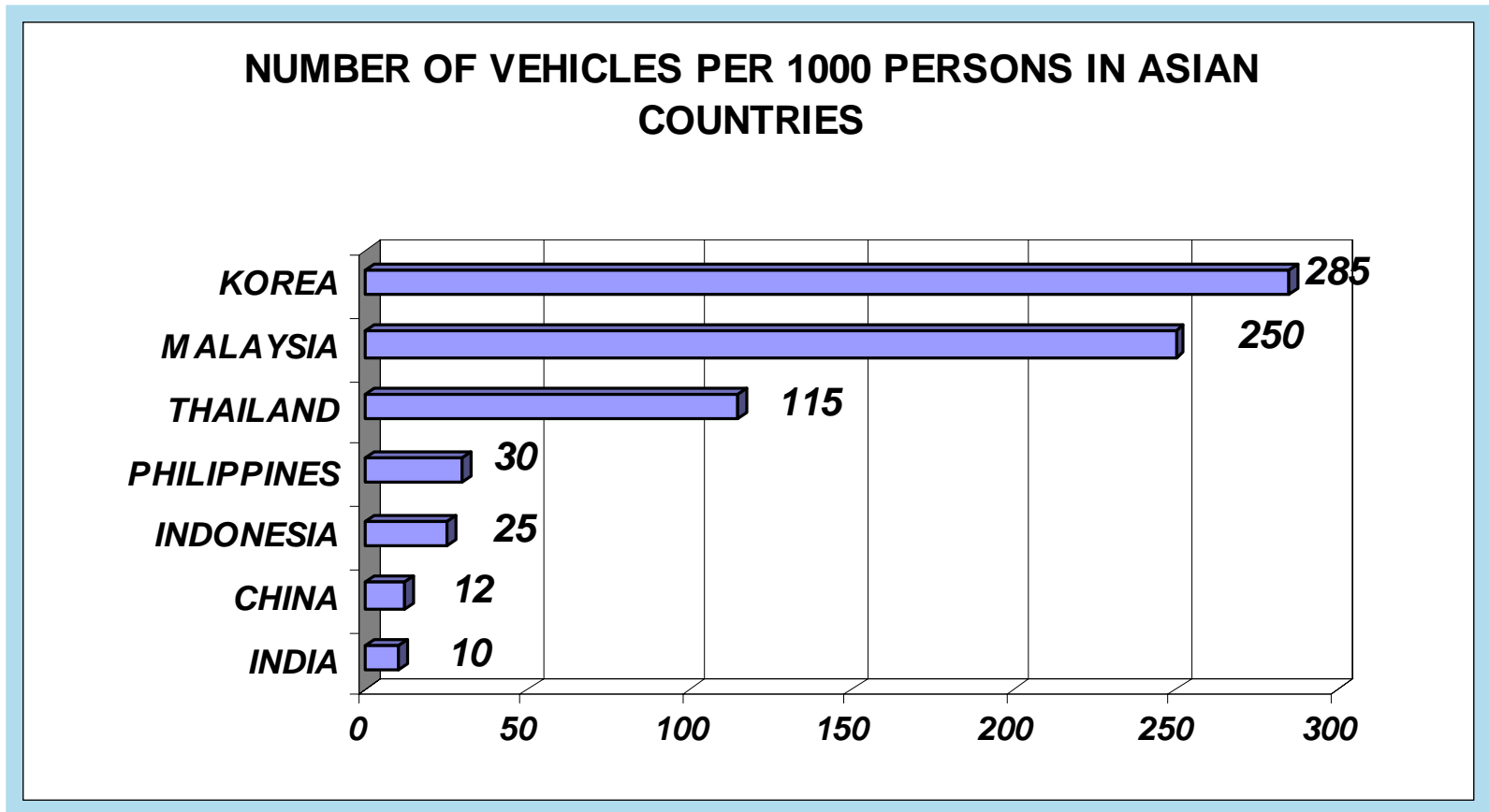
Increasing Urban Sprawl

- Leads to increasing motorization

Increasing Motorization (2005–2035)

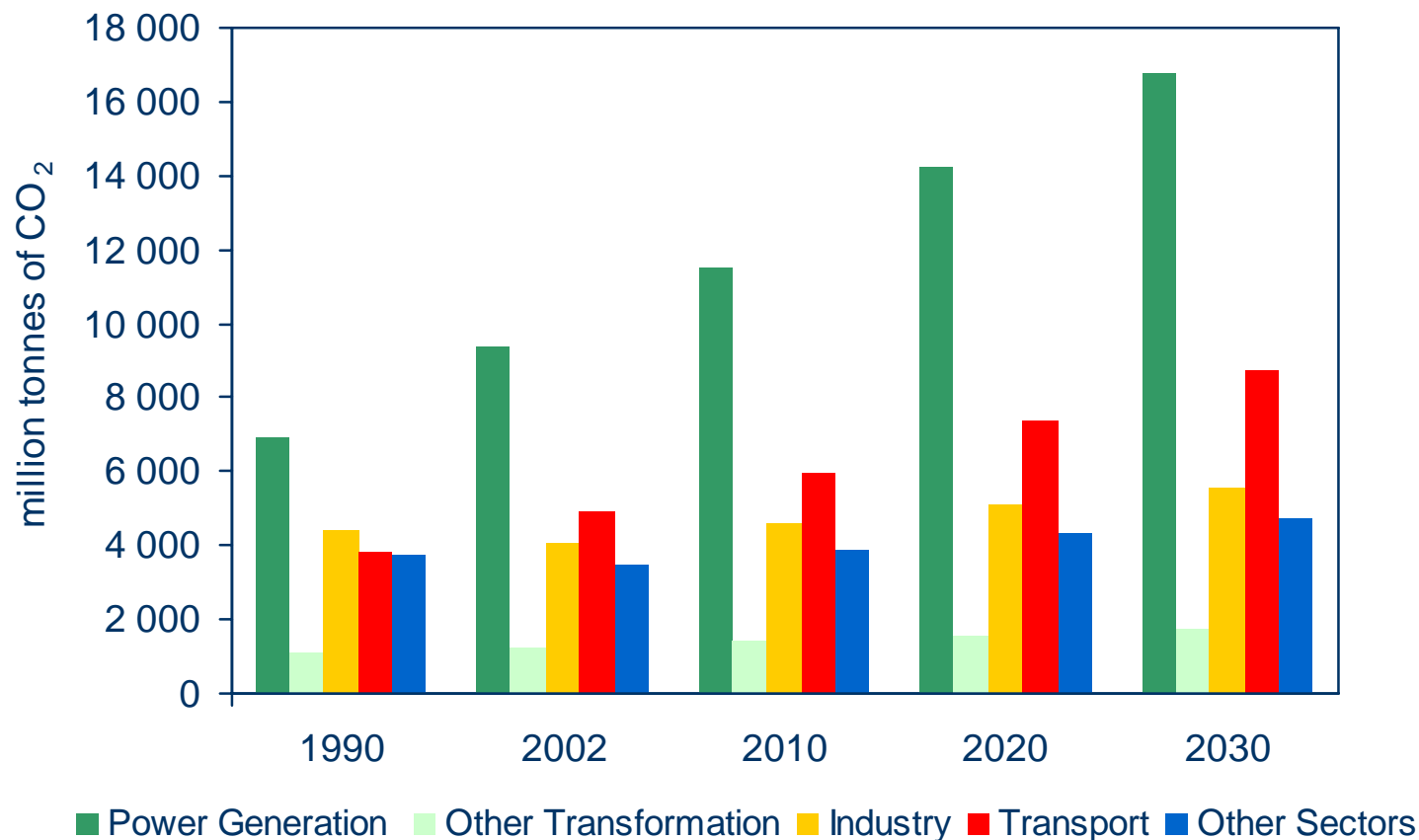
- China 4.6 fold increase
- India 7.6 fold increase

Vehicle Ownership in Asian Countries



Source: Alok Rawat, "Fuel Efficiency Improvement and Automotive CO2 Reduction Policies – an Indian Perspective" UNEP Workshop, Shanghai, October 2004

World CO₂ Emissions by Sector, 1990-2030



The share of transport in CO₂ emissions will increase from 21% today to 23% in 2030

Source: IEA World Energy Outlook 2004

Increasing Transport Energy Use

Energy Use	=	Number of Vehicles	x	Utilization	÷	Fuel Efficiency	x	Fuel Energy Intensity
KJ		units		km/yr		km/L		KJ/L

China: 6 - 9% per year

India: 5 - 8 % per year

6% per year for 20 years is over 300% !!

Emerging Asia will demand 45% of the total world increase in fuel use

Transport Efficiency: Options

- **Effective and efficient integration of land use and transport planning**
- **Reduce fuel consumption, improve energy efficiency**
 - **traffic management**
 - **mode share**
- **Vehicle, engine technology and fuel sources**

Transport and Land Use Integration

Understand the direct relationship between land use and the need to travel:

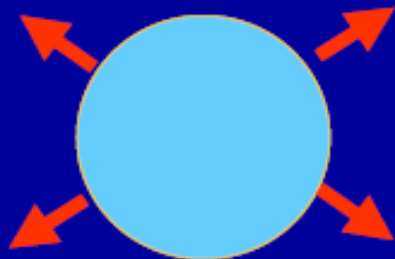
- Improve the access to goods and service while minimizing the need to travel
- Village concept of high density urban planning within mega cities
- Linking these 'villages' with efficient public transport
- Livable and sustainable community based green cities

Public Transport-centric Development



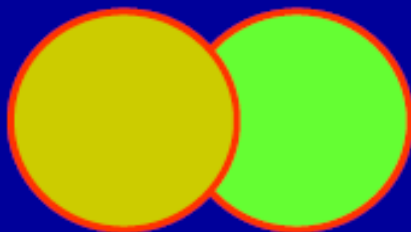
Centralisation – Denser, Higher

- Reduce car dependency
- Favour public transport



Decentralisation – Closer to home

- Reduce the need to travel
- Facilitate peak spreading



Integration - Intensification along rail corridors

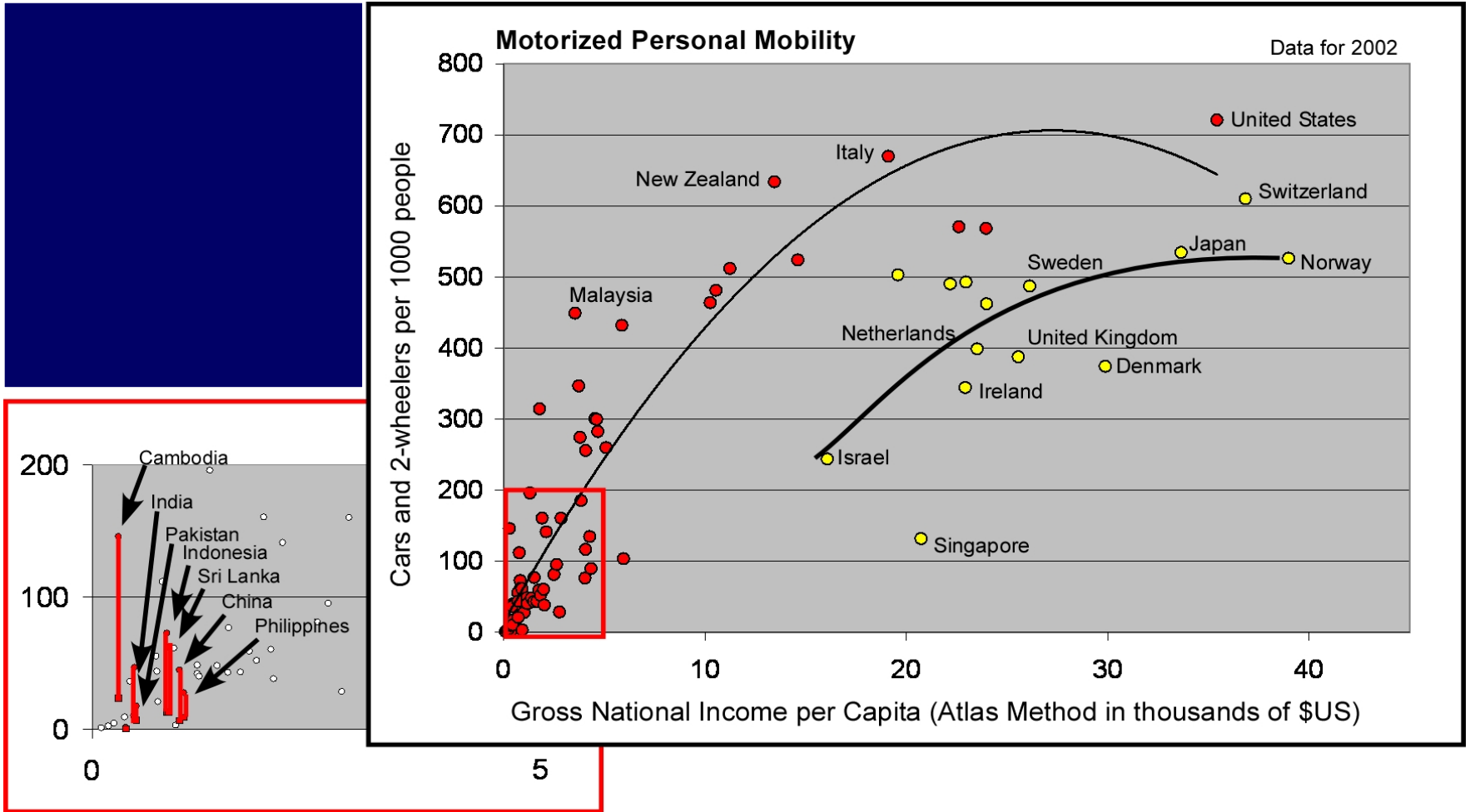
- One-stop convenience
- Seamless journey



Vision for Urban Private Transport

- **Market instruments that charge the cost of externalities to the use of private motorized transportation**
 - **Congestion, pollution, climate change and use of public infrastructure**
- **Promote increased mobility together with a reduced demand for personal transport usage**
 - **reduce km/yr**

Motorization, which road to take?



Vision for Urban Mass-Transport and NMT

- **Public transport systems that provide door-to-door solutions**
- **Safe, secure, rapid and user-friendly high quality public mass-transport**
- **Pedestrian zones and walkways**
- **Segregated cycle paths**
- **Park-and-ride car and bike parks**

Vision for Freight and Long Distance Transport

- **Economic growth that extends the supplier and distribution chains**
- **Efficient larger capacity, long-distance carriers**
- **Modal shift to less-GHG-intensive transport modes (e.g.: railways)**
- **Well-defined trucking routes with spatial and temporal truck restrictions in other zones**
- **Fast traveler-friendly mass-transport access to well-located terminals and airports**

Energy Efficiency

Mode		Average Energy Efficiency
Passenger	Rail	104
	Shinkansen	83
	Bus	193
	Private Car	665
	Domestic Aviation	395
Freight	Rail	113
	Commercial Truck	665
	Private Truck	2646
	Shipping	129
	Domestic Aviation	5271

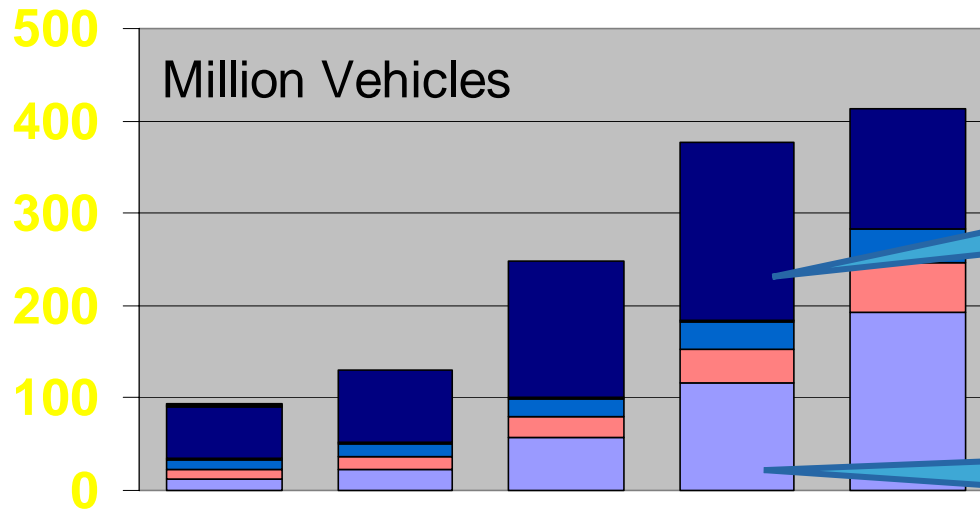
(Unit: kcal/pass.-km)
(Unit: kcal/t-km)

Source: MILT and Central Japan Railway Company

Vehicle, Engine Technology and Fuel Sources

- **Vehicle energy efficiency and emissions “worldwide” standards**
 - **Zero implementation lag**
 - **Increased Asian leadership for 2-wheelers**
 - **Promote fleet renovation**
- **Correctly implemented and rigorously enforced vehicle inspection programs**
- **Achieve a substantial portion of on-road transport to clean and CO₂ efficient biofuels**

Vehicle Population Growth in China



3.5 x
by 2025

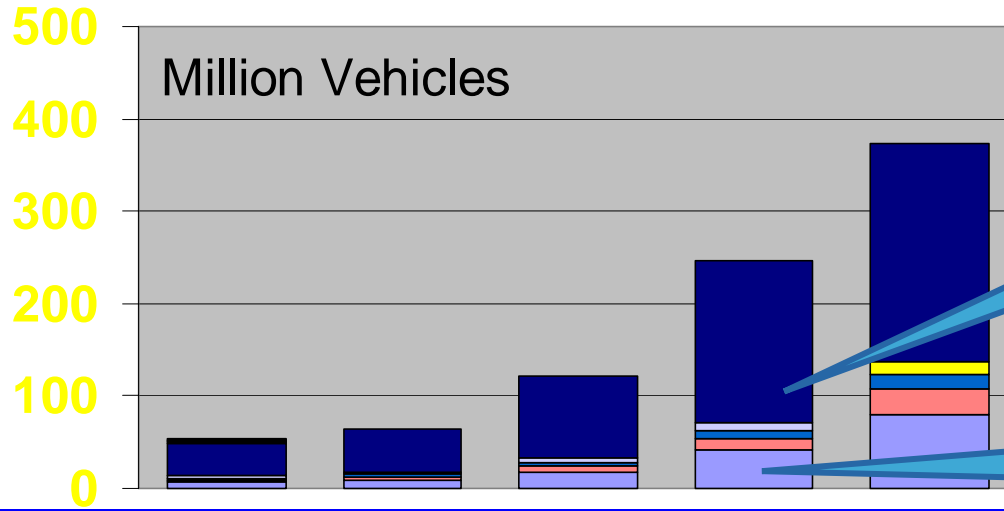
9 x
by 2025

Class	2005	2008	2015	2025	2035
2-W	55.3	78.1	146.7	193.2	130.4
3-W	2.0	1.5	1.7	0.3	0.0
HCV	10.4	13.9	19.9	29.3	37.5
LCV	9.4	13.1	22.8	37.7	52.9
Car, SUV	12.9	23.4	56.8	115.8	192.7
Grand Total	90.0	130.0	248.0	376.4	413.6

Vehicle Population Projection from Segment Y plc
See: <http://segmenty.com>



Vehicle Population Growth in India



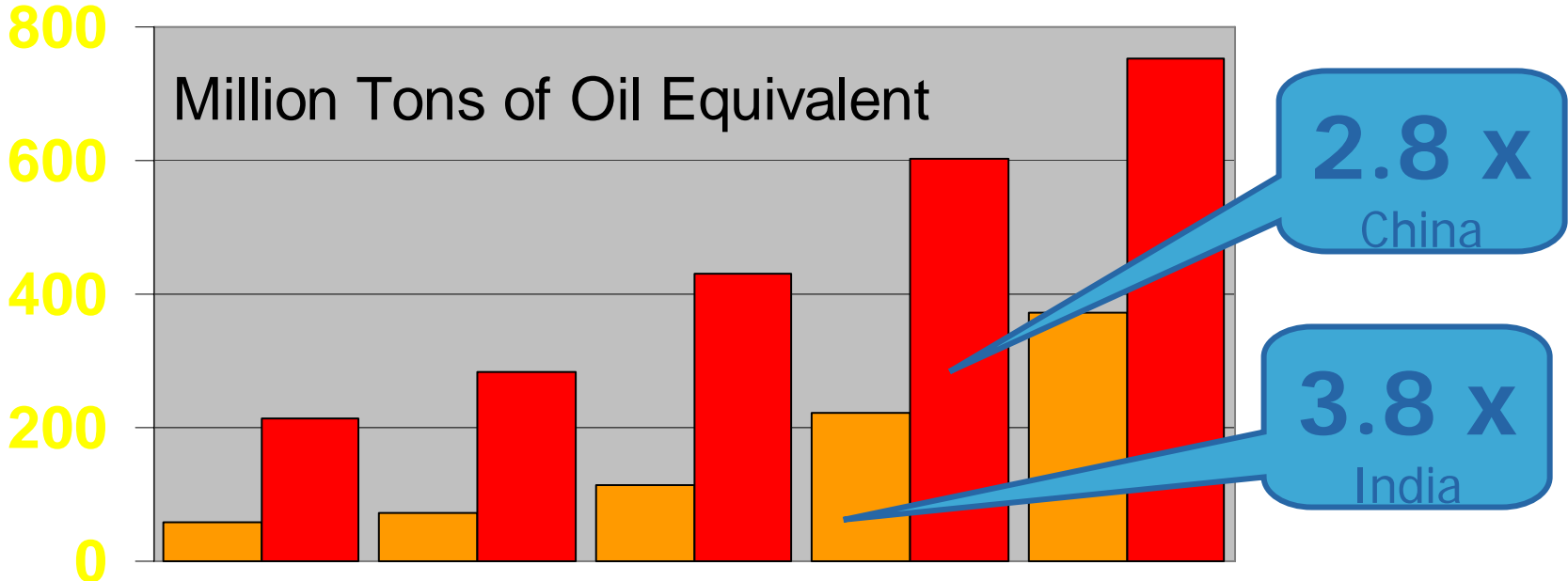
Class	2005	2008	2015	2025	2035
2-W	35.8	46.1	87.7	174.1	236.4
3-W	2.3	3.0	5.3	8.8	13.1
HCV	2.4	2.9	4.6	9.1	16.2
LCV	2.4	3.2	5.7	12.5	26.9
Car, SUV	6.2	8.8	18.0	41.6	80.1
Grand Total	49.1	63.9	121.3	246.1	372.7

5 x
by 2025

6.7 x
by 2025

Vehicle Population Projection from Segment Y plc
See: <http://segmenty.com>

Fuel Consumed by On-road Transport



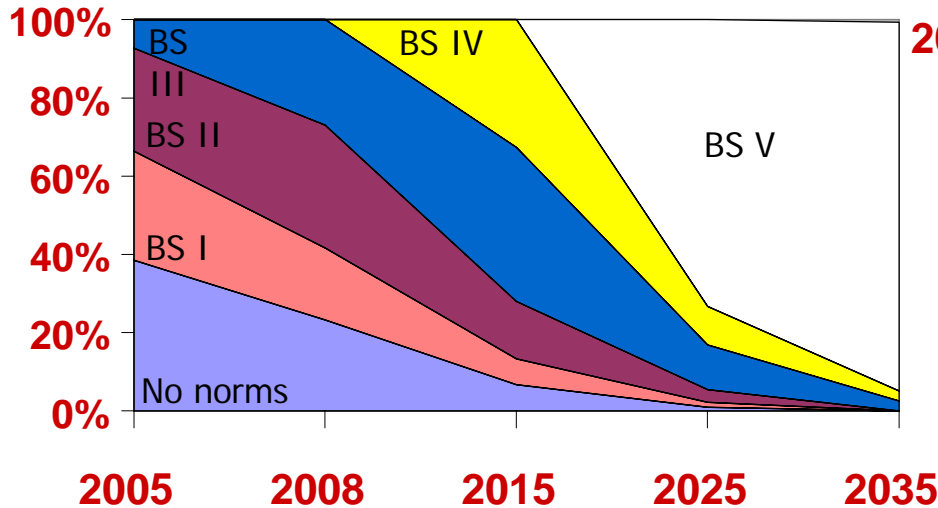
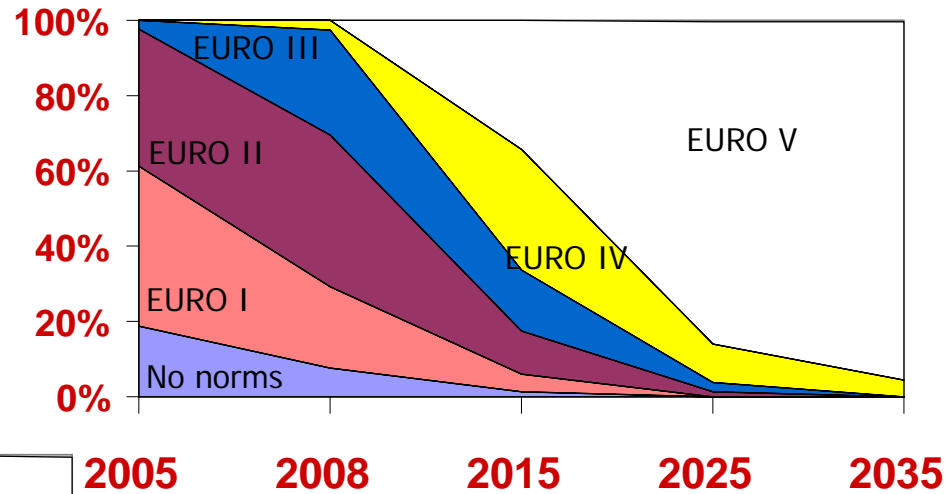
Economy	2005	2008	2015	2025	2035
China	215	284	431	602	753
India	58	73	115	221	371

Segment Y Vehicle Population Projection using IEA SMP model

Emissions Standards in Car Populations

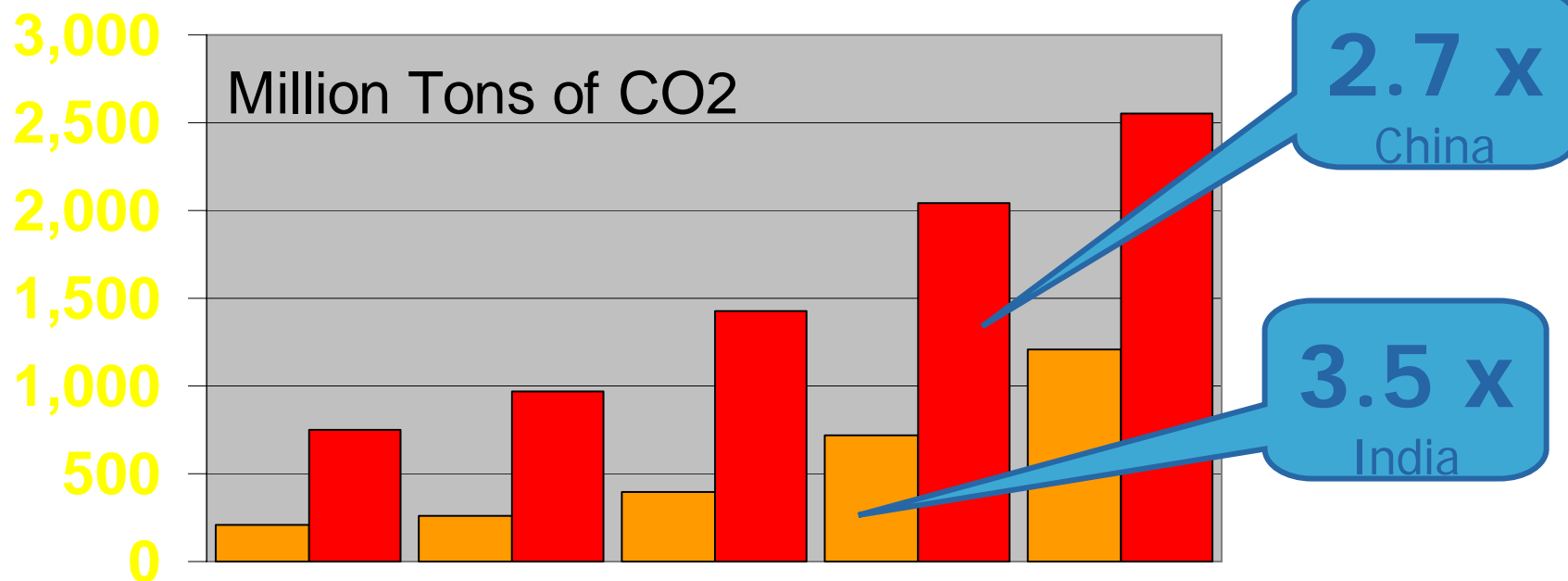
China

India



Vehicle Population Projection from Segment Y plc
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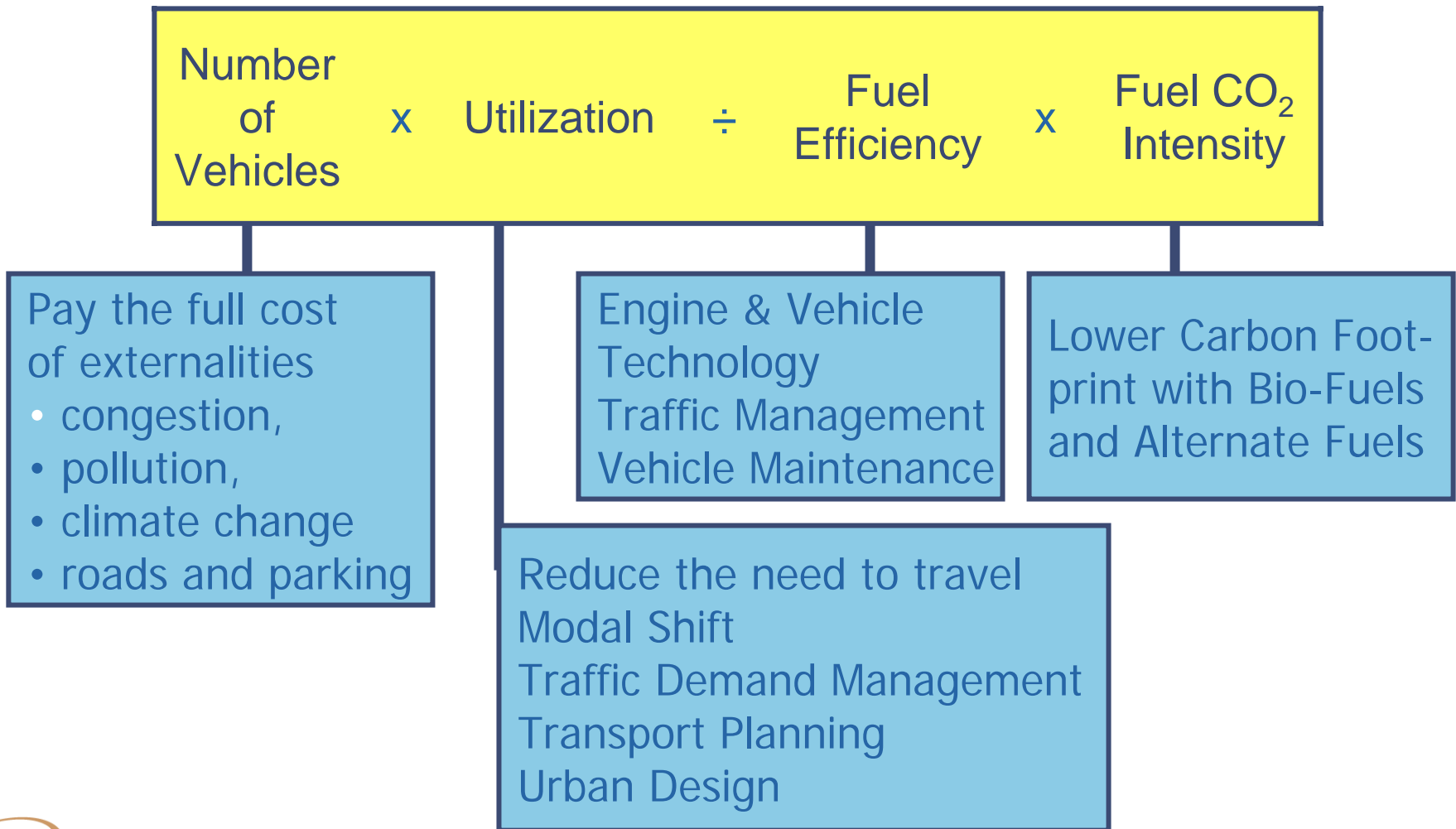
CO₂ emissions from on-road transport



Economy	2005	2008	2015	2025	2035
China	752	967	1,429	2,039	2,557
India	208	256	391	721	1,212

Segment Y Vehicle Population Projection using IEA SMP model

How can we limit the growth of GHG emissions from transport?



Co-benefits of Climate Change Mitigation

To promote the adoption of policies to reduce GHGs it is important to emphasize the co-benefits of such measures in terms of:

- Air Quality and Health
- Traffic and Congestion
- Quality of Life
- Economic Development
- Transport Efficiency

Thank you.



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