Sixth Regional EST Forum in Asia

New Delhi, India

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Global modal shift scenario - complementing Energy and CO_2 benefits through implementing the Bangkok 2020 Declaration

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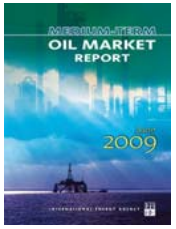
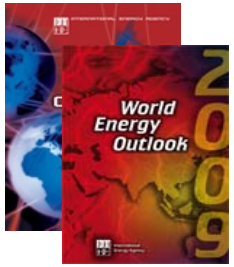
www.iea.org

IEA, transport and liquid fuels

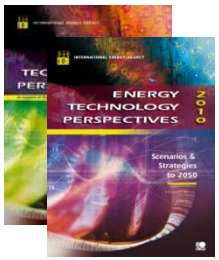
Relevant publications



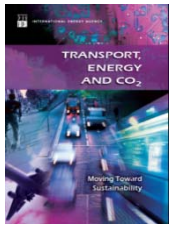
- **Medium term Oil Market Report**
  Horizon 2015, focus on oil
  Scenarios currently based on two different GDP growth assumptions



- **World Energy Outlook (WEO)**
  Horizon 2035, all energy sources
  Scenarios depicting different developments on the basis of policy actions
  One underlying assumption for GDP and population growth
  Includes a thorough analysis on the oil supply availability



- **Energy Technology Perspectives (ETP)**
  Horizon 2050, all energy sources
  Scenarios that pay particular attention to the role of technology, especially on the demand side
  One underlying assumption for GDP and population growth

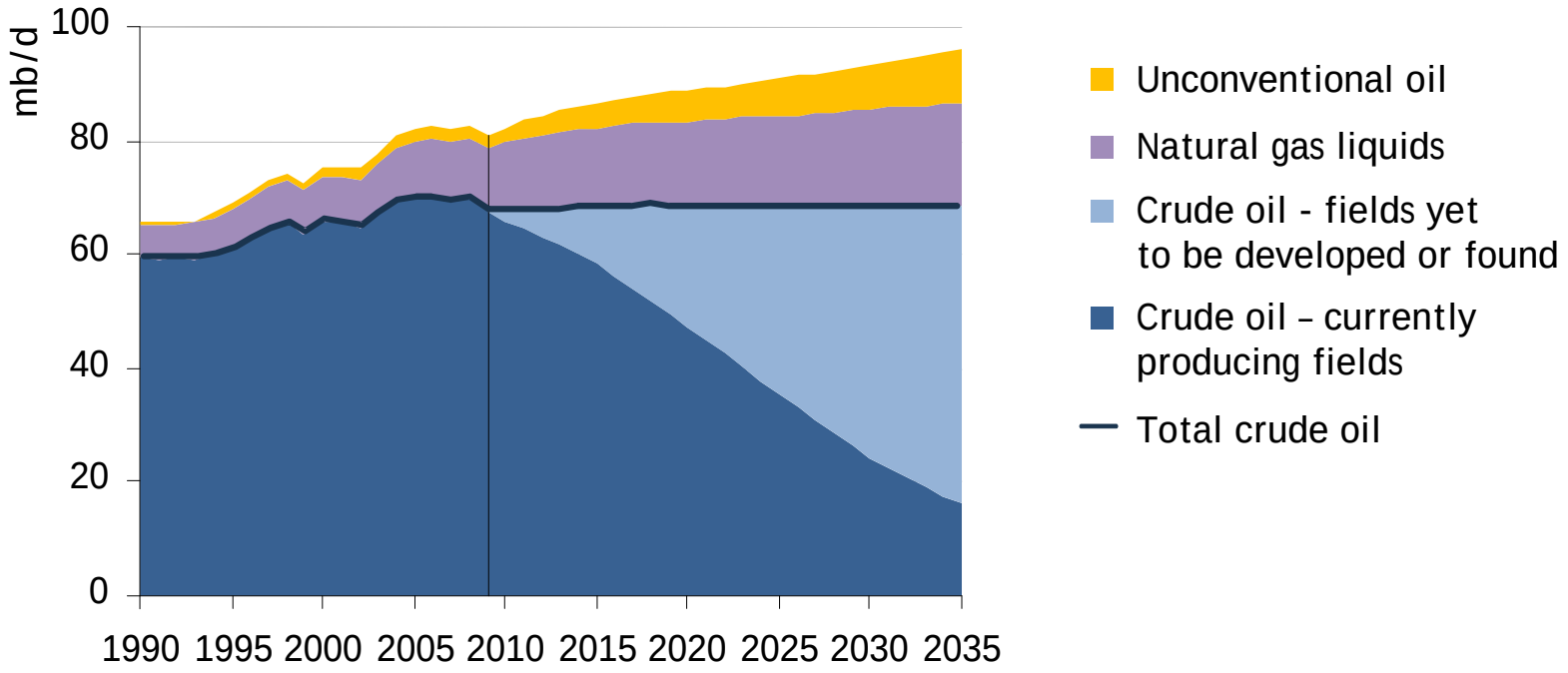


- **Transport, energy and CO_2 (Transport book)**
  Moving towards sustainability
  (ETP Transport book, 2009)
  Horizon 2050, all energy sources
  Builds and expands the work done on ETP

Oil production becomes less crude

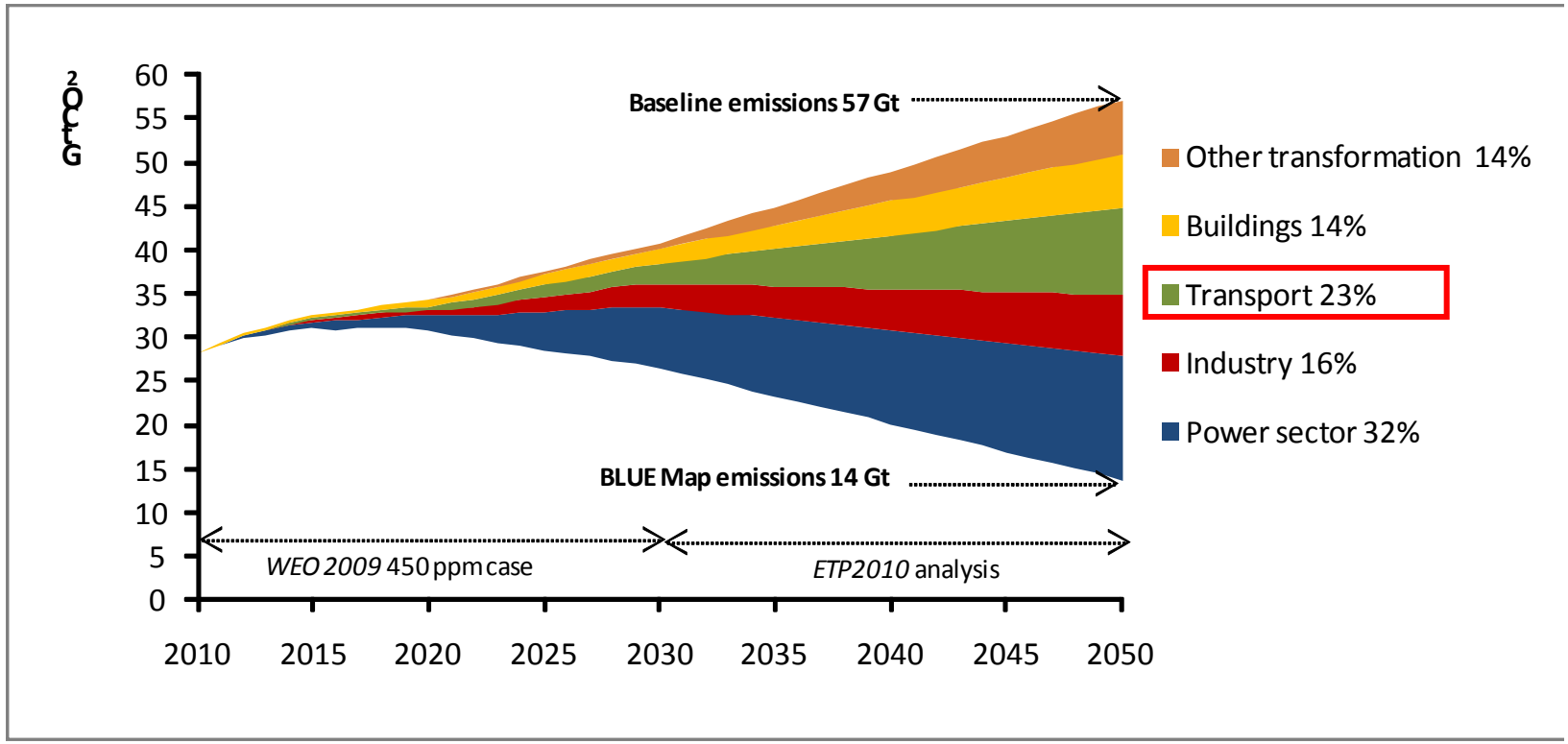
World Energy Outlook 2010

World oil production by type in the New Policies Scenario



Global oil production reaches 96 mb/d in 2035 on the back of rising output of natural gas liquids & unconventional oil, as crude oil production plateaus

World energy-related CO_2 emissions abatement by region

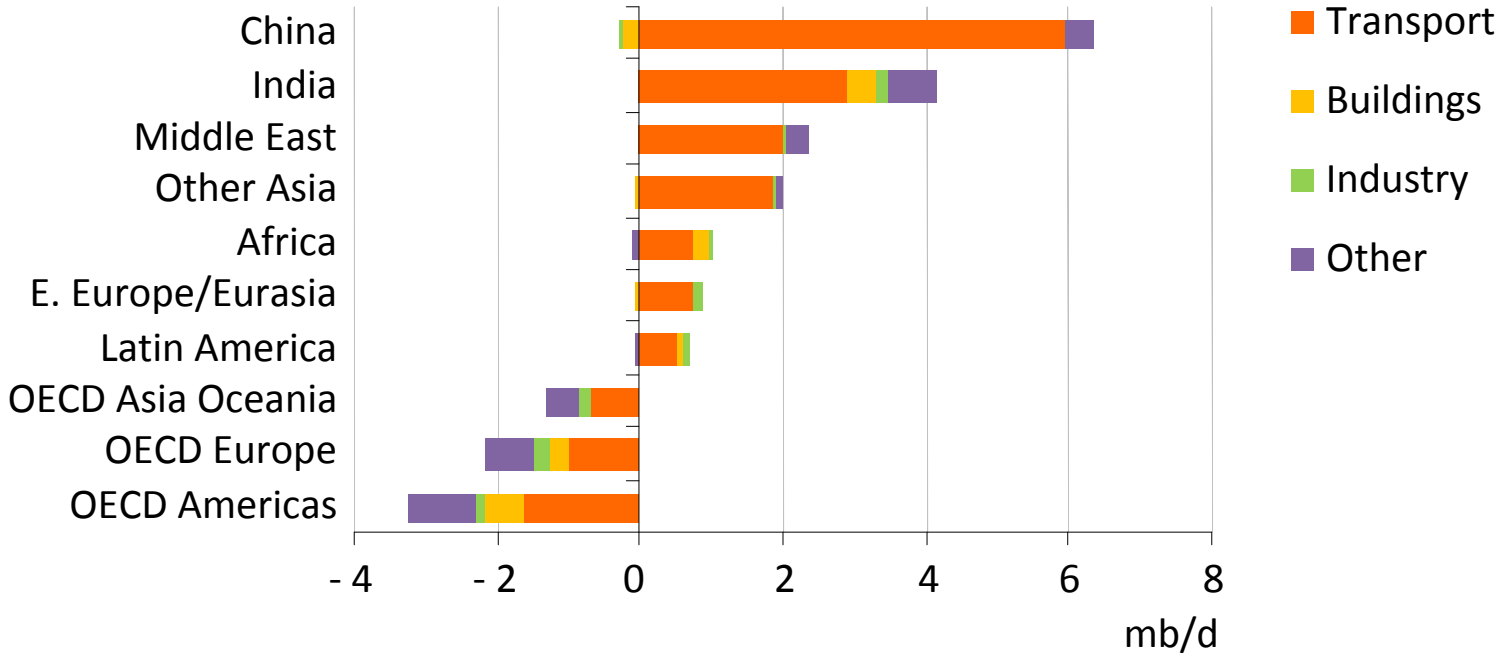


In the BLUE Map scenario, transport accounts for 23% of reductions. Additional savings accrue in "transformation", since less high-CO2 fuels (such as coal-to-liquids) are produced for transport use.

Transport drives oil demand

WORLD ENERGY OUTLOOK 2011

Change in primary oil demand by sector & region in the New Policies Scenario, 2010-2035

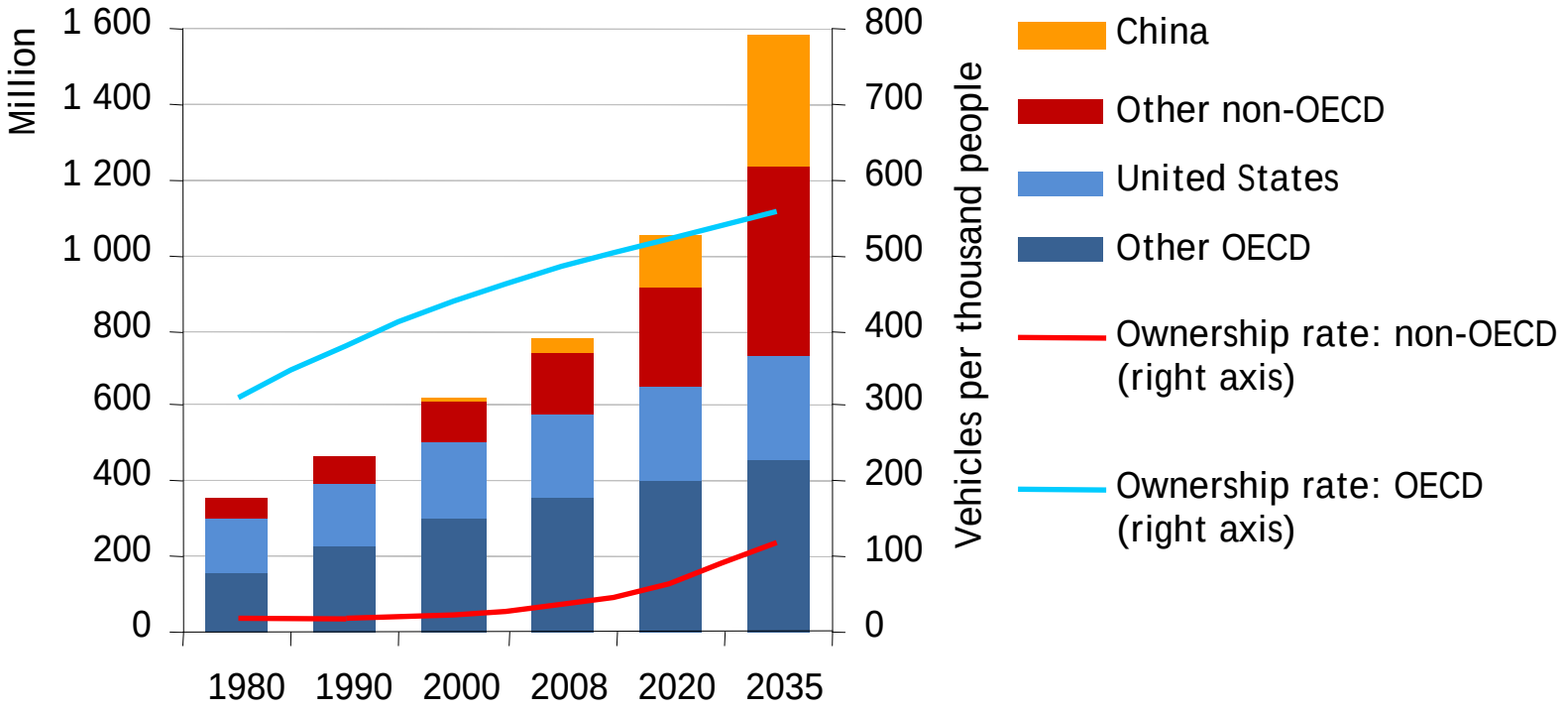


Transport net demand expands by 14 mb/d between 2010 & 2035, outweighing a net fall in demand of more than 1 mb/d in other sectors

Car ownership is surging in the emerging economies

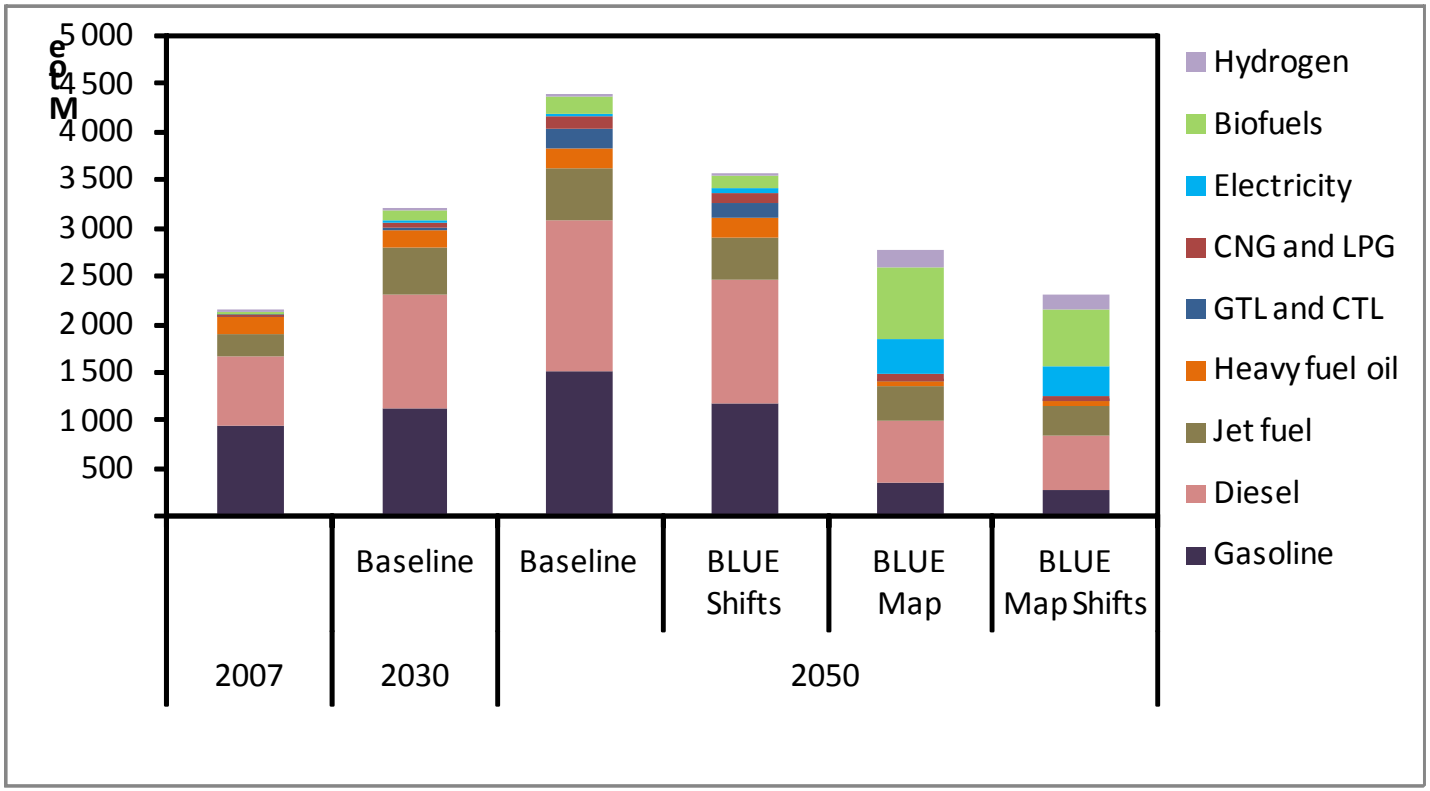
World Energy Outlook 2010

Passenger light-duty vehicle fleet and ownership rates by region in the New Policies Scenario



The global car fleet will continue to surge as more & more people in China & other emerging economies buy a car, overshadowing continued modest growth in the OECD

Transport Energy Use by ETP Scenario



- *Global transport energy use in Baseline doubles by 2050*
- *BLUE Shifts achieves a 20% reduction in 2050; BLUE Map achieves 40%, BLUE Map/Shifts achieves nearly 50%*
- *Nearly 50% of energy is low-CO_2 renewable in 2050*

Key Transport steps to achieve BLUE outcomes

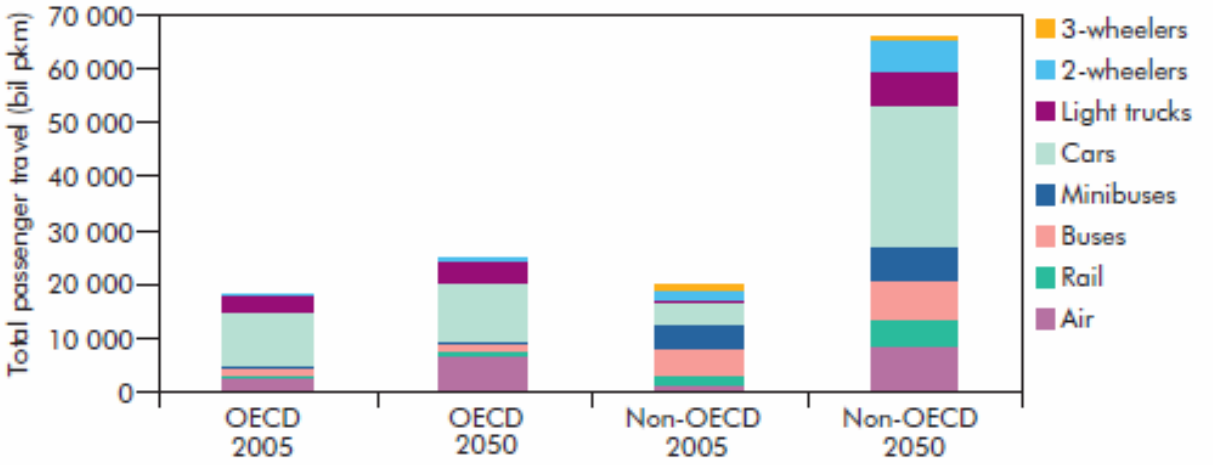
- **BLUE Map – *technology* solutions**
  - 50% reduction in conventional new PLDV (car, SUV) fuel intensity by 2050
  - 30-50% reduction in energy intensity for bus/truck/rail/ships/aircraft by 2050
  - Strong uptake of advanced technology vehicles and Fuels
    - Plug-in Hybrids [PHEVs], starting in 2010-2015
    - Battery electric vehicles [BEVs], starting in 2010-2015
    - Fuel cell vehicles [FCVs], starting in 2025
    - Advanced, low-GHG Biofuels reach 12% of transport fuel use by 2030, 25% by 2050

- **BLUE Shifts – *travel* solutions**
  - 25% lower level of car and air travel in 2050 compared to Baseline
  - Up to 2x travel by rail, bus (such as Bus Rapid Transit systems)
  - Lower travel demand due to better land use planning, road pricing, telematic substitution

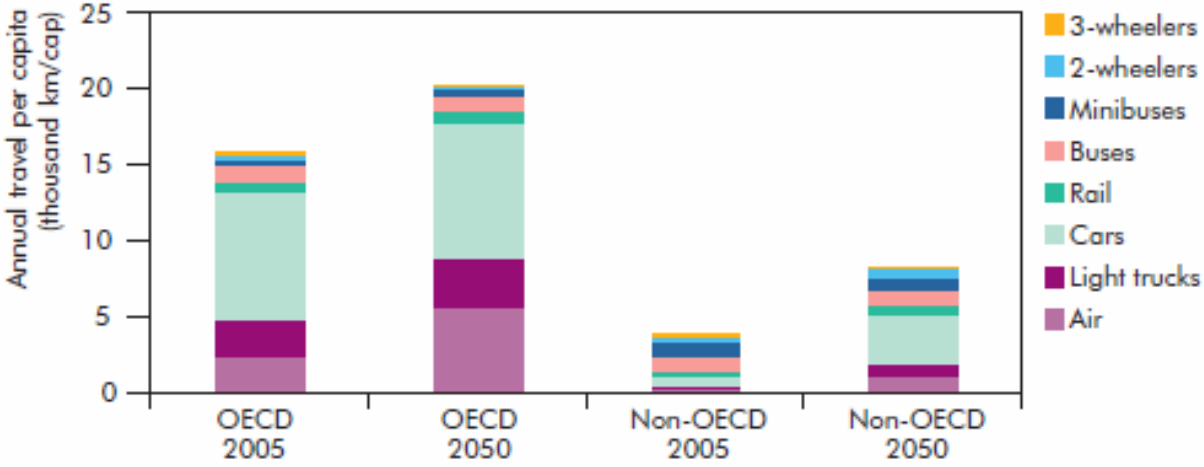
IEA ETP Baseline travel projection: land passenger travel by mode and region

Non-OECD is where the growth happens,
though from a far lower base per capita than OECD

Total

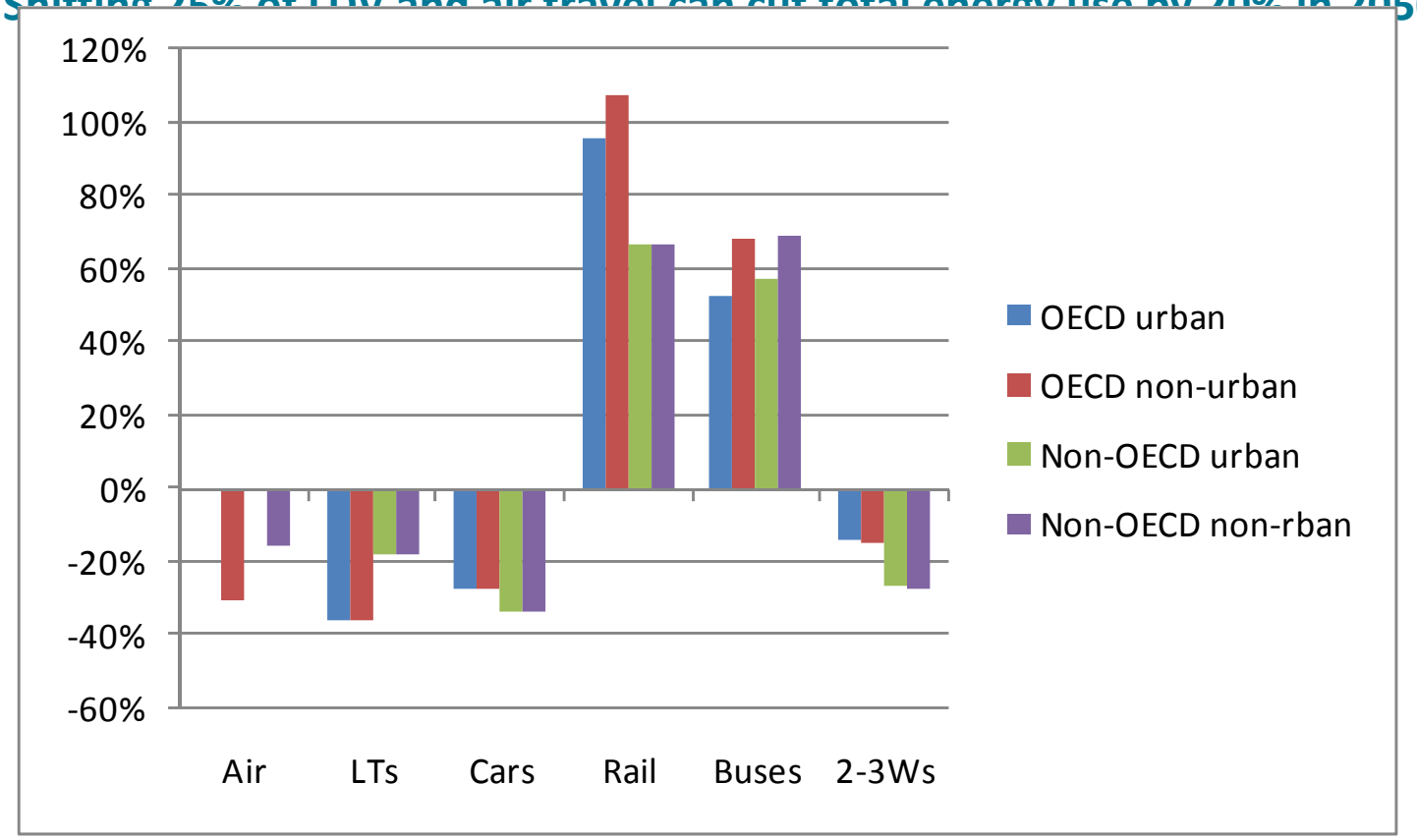


Per capita



Passenger Travel:
Changes from Baseline to BLUE Shifts Case in 2050

Shifting 25% of LDV and air travel can cut total energy use by 20% in 2050

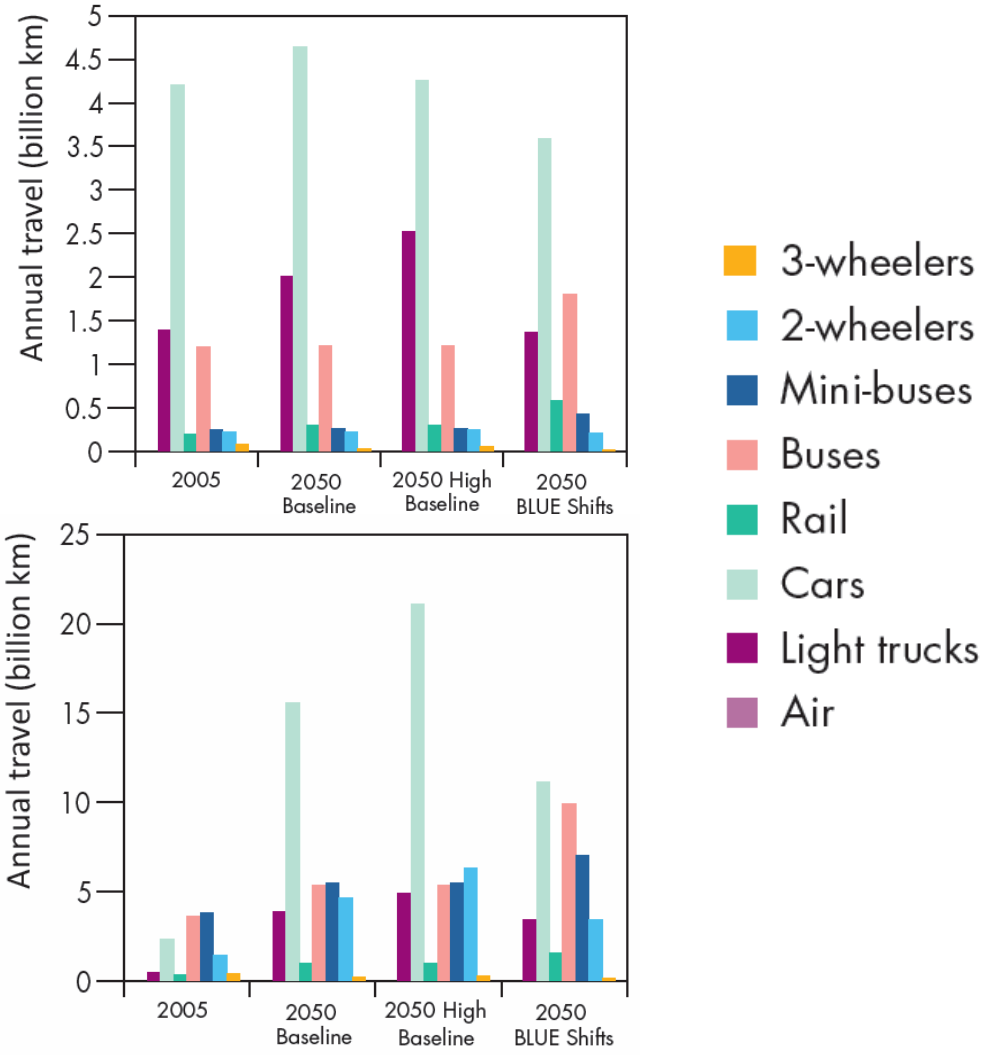


BLUE Shifts results by mode, region

Growth in car, air travel eliminated in OECD, slowed in non-OECD; results are more dramatic compared to High Baseline Scenario

OECD

Non-OECD

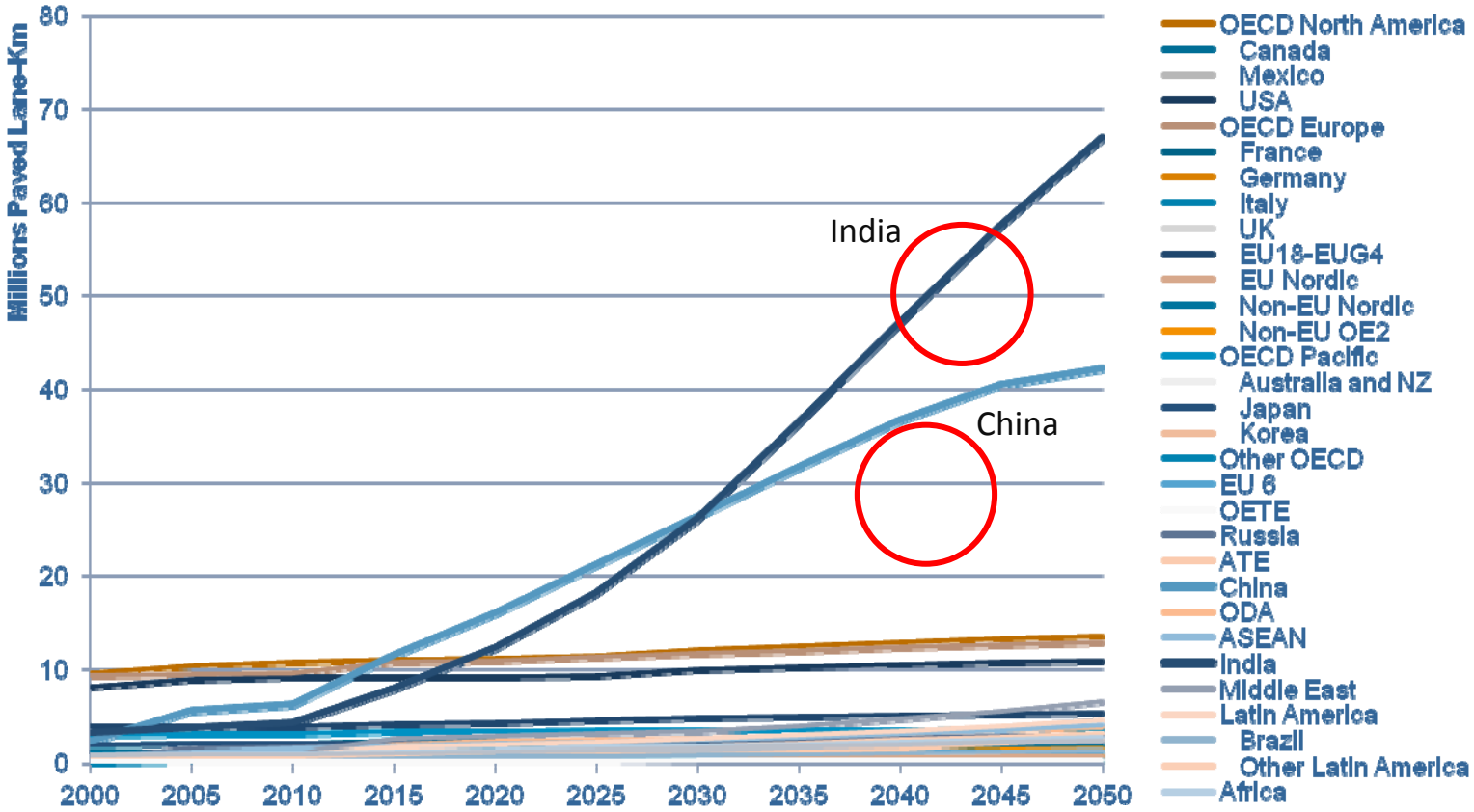


How to get there?

Many possible ways; here is one: an indicative package of modal shift policies and potential impacts on cutting urban-area LDV travel.

	OECD (%)	Non-OECD (%)
Urban planning and land use changes	10	10
Investments in urban transit systems and non-motorised transport infrastructure	5	10
Parking policies and road pricing	5	2.5
ITS, telematics and other supporting policies	5	2.5
Total	25	25

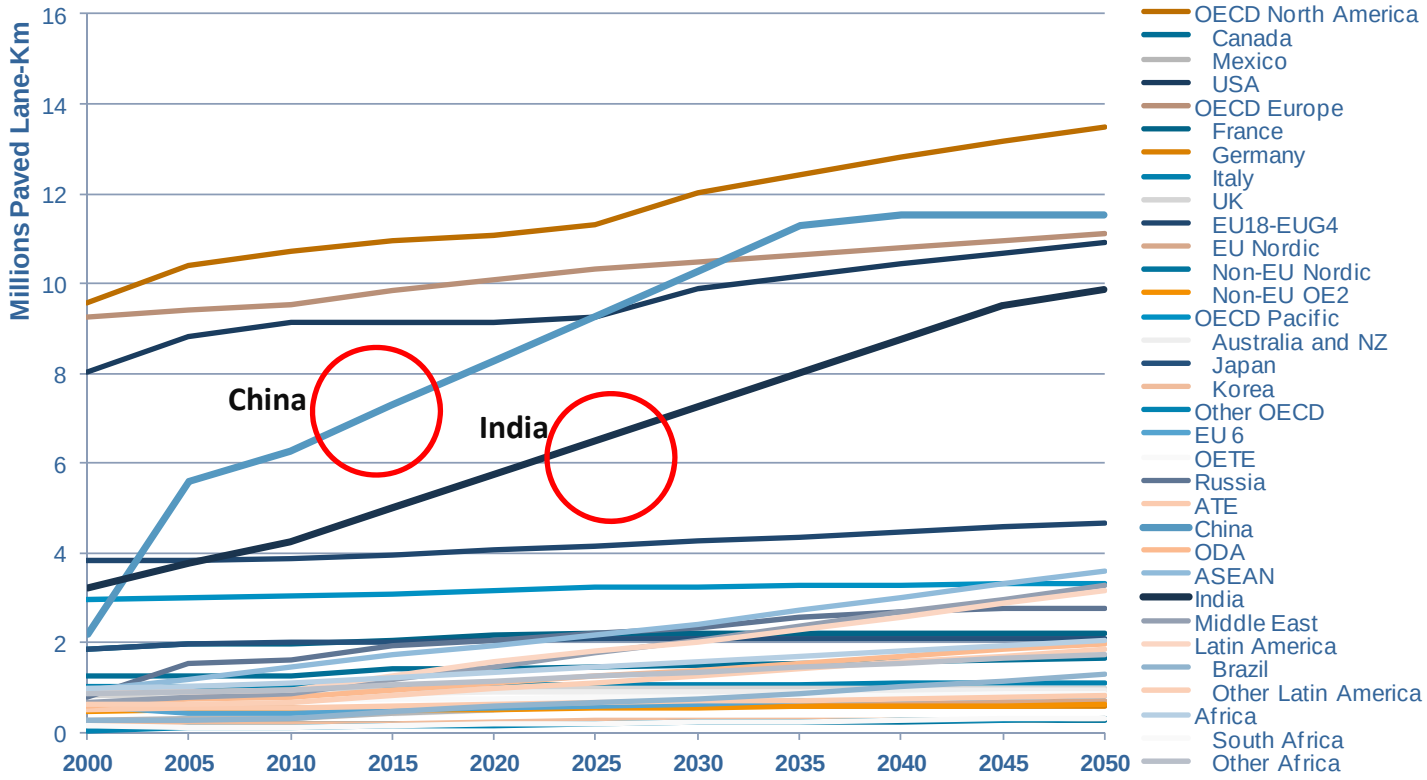
Roadway required to keep up with IEA vehicle travel projection



It is impossible for China and India to reach these levels.

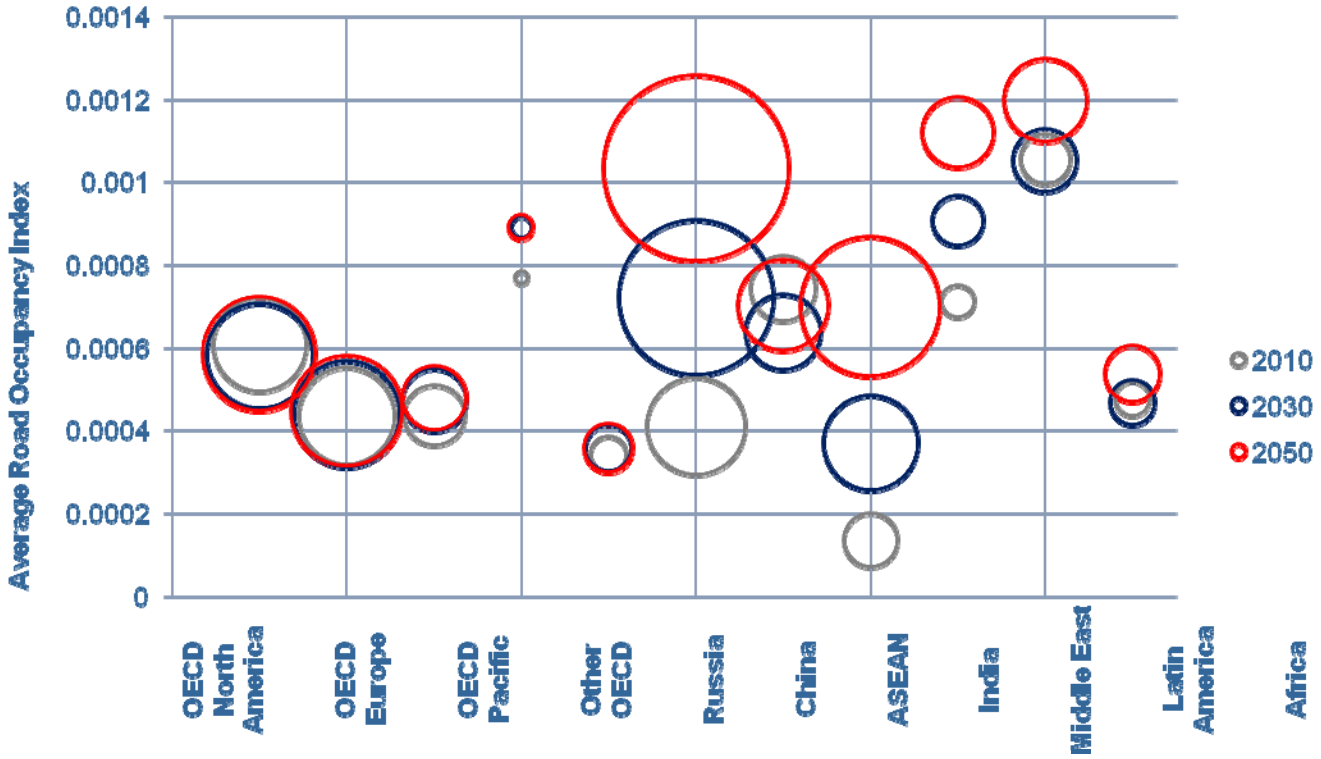
Construction and Density Limits Applied (preliminary; do not cite)

Reflects caps on rates of road construction and land take. China and India then fall within US/EU road infrastructure levels. However these could be optimistic and still imply high rates of road length increases



Road infrastructure – Implications for traffic (preliminary, do not cite)

This shows "road occupancy" (based on vkm per lane-km), with circle size representing number of vkm; China and India grow rapidly and increase their ratios (suggests strong increases in traffic congestion)

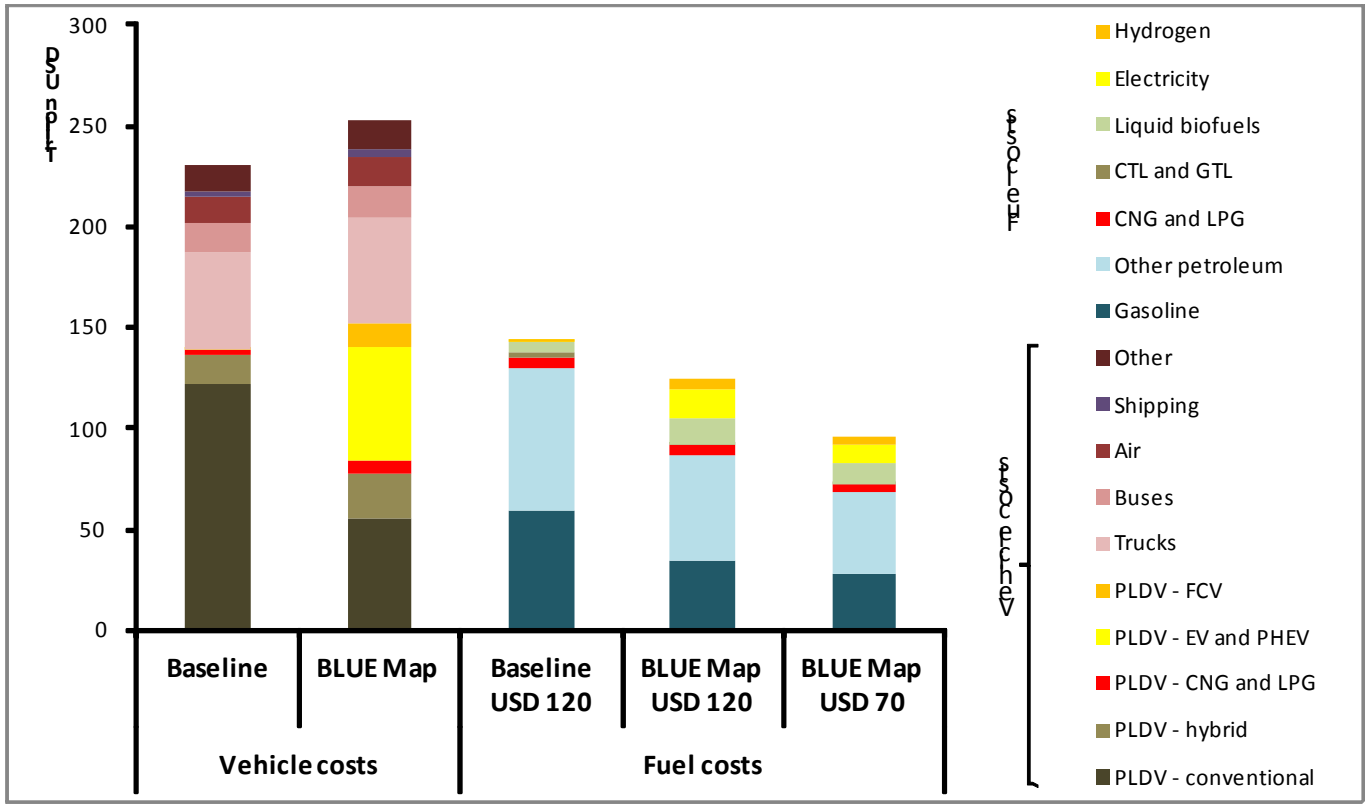


Non OECD regions pose new TDM challenges

What about infrastructure costs?

- Depending on how this is done, cutting car and air travel by 25% could result in enormous savings to society
  - The key is, it is savings if people are able to and *want* to switch modes and/or cut their travel.
- Early indications are that the costs of BLUE Shifts are well below their implied savings
- A full cost-benefit report will be completed by Summer 2012

Global Vehicle and Fuel Costs, 2010-2050 by ETP Scenario

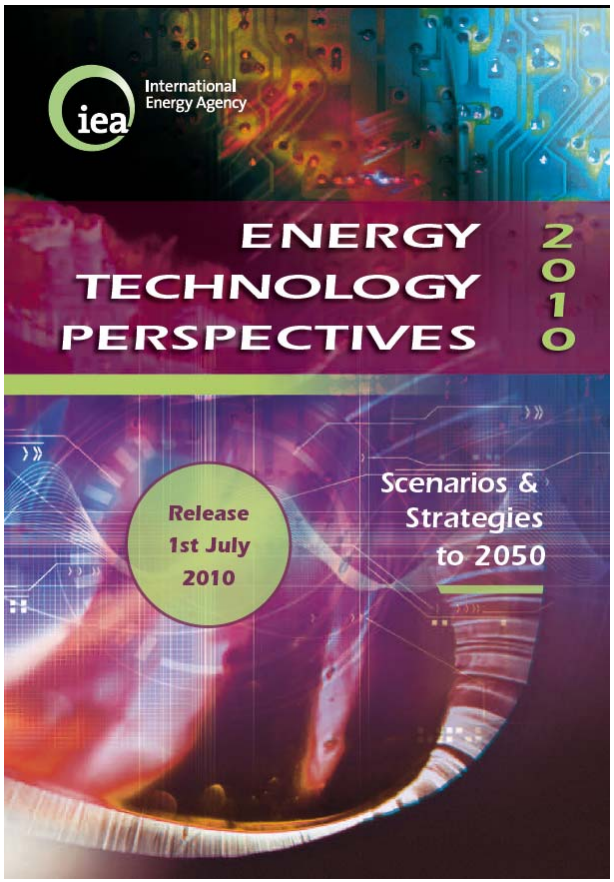


PLDV=passenger light-duty vehicle; costs are in real $2008, 0 discount rate.

Fuel cost savings mostly or fully offset the costs of advanced technology vehicles in BLUE Map

Conclusions

- Without policy interventions oil use and related CO_2 emissions worldwide could double by 2050
- We can change this picture dramatically and cut transport CO2 below current levels via a combination of
  - Strong efficiency improvements to all modes
  - Rapid uptake of advanced technology vehicles and alternative fuels after 2015
  - LDV and air travel reductions via modal shifts and smart growth, including strong investments in state-of-art bus and rail transit systems
- The IEA 25% BLUE Shifts Scenario cuts Energy use by 20% worldwide, among other benefits. Other more aggressive scenarios are possible.
- The cost of these alternative futures may be surprisingly small or even negative on a societal cost basis, especially if oil prices are high (in Baseline).



Thank You

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