World Bank Initiatives on Green Trucks/Freight Transport Initiatives

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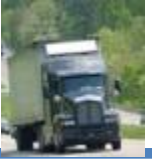
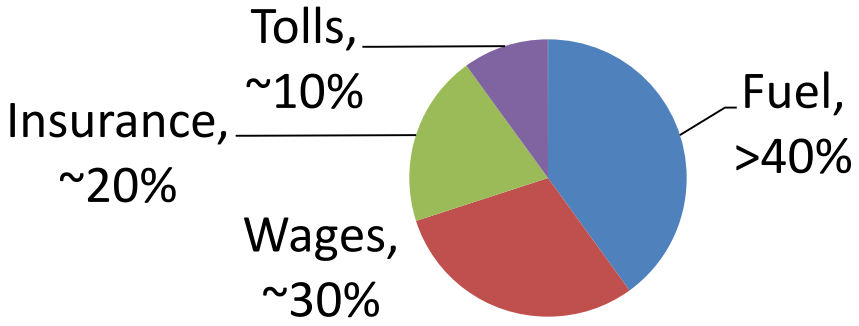
October 2011



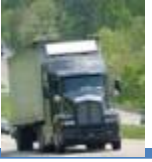
Convergence of Agendas: Green + Freight

1. Improvements in the freight and logistics sector to drive cost-efficiency and competitiveness
   - Fuel costs weigh heavy on truck operations
   - Approximate share of operating costs in Brazil (excluding maintenance and depreciation) is 40-50%:



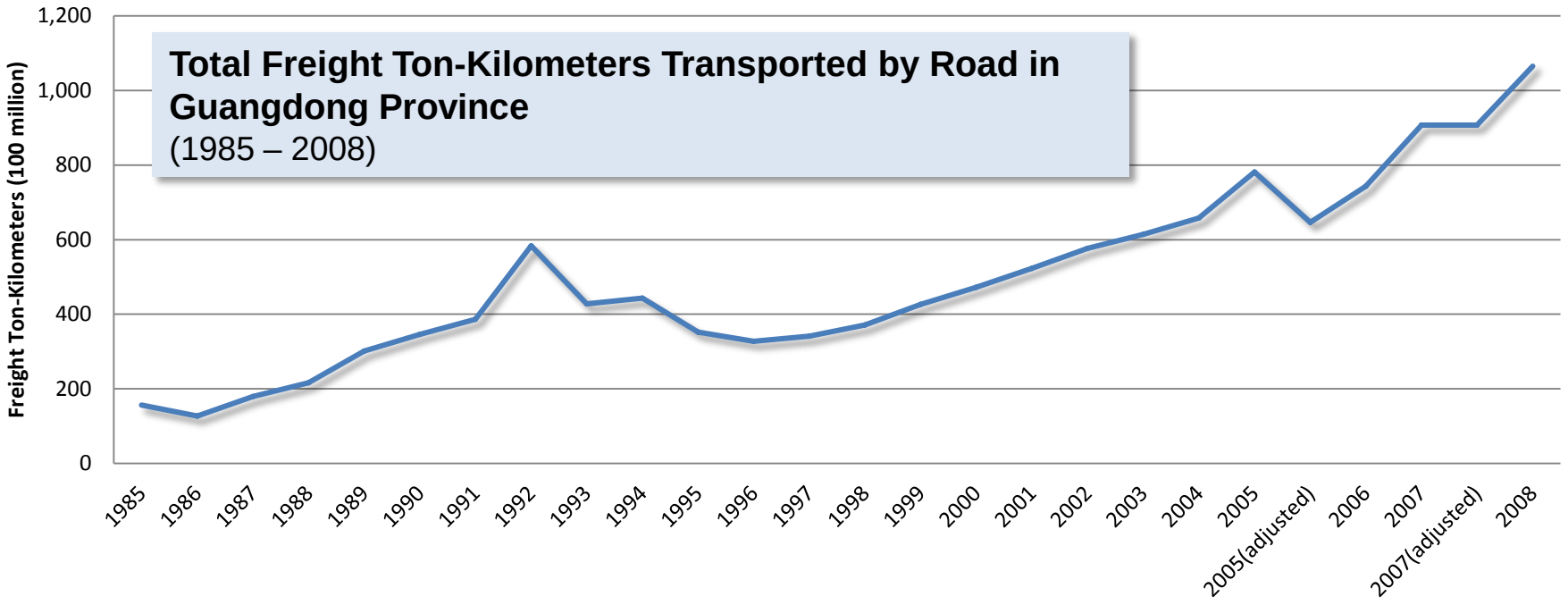
For comparison:
In China: ~60%
In US: ~36%
In Europe: 20-30%

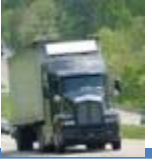
2. Aligning "green" objectives:
   - Climate change mitigation (CO2 and black carbon)
   - Reducing local air pollution (PM, NOx, SOx, HC, CO)
   - Finding synergies and co-benefits, such as congestion management, energy independence and road safety



Trucks are here to stay

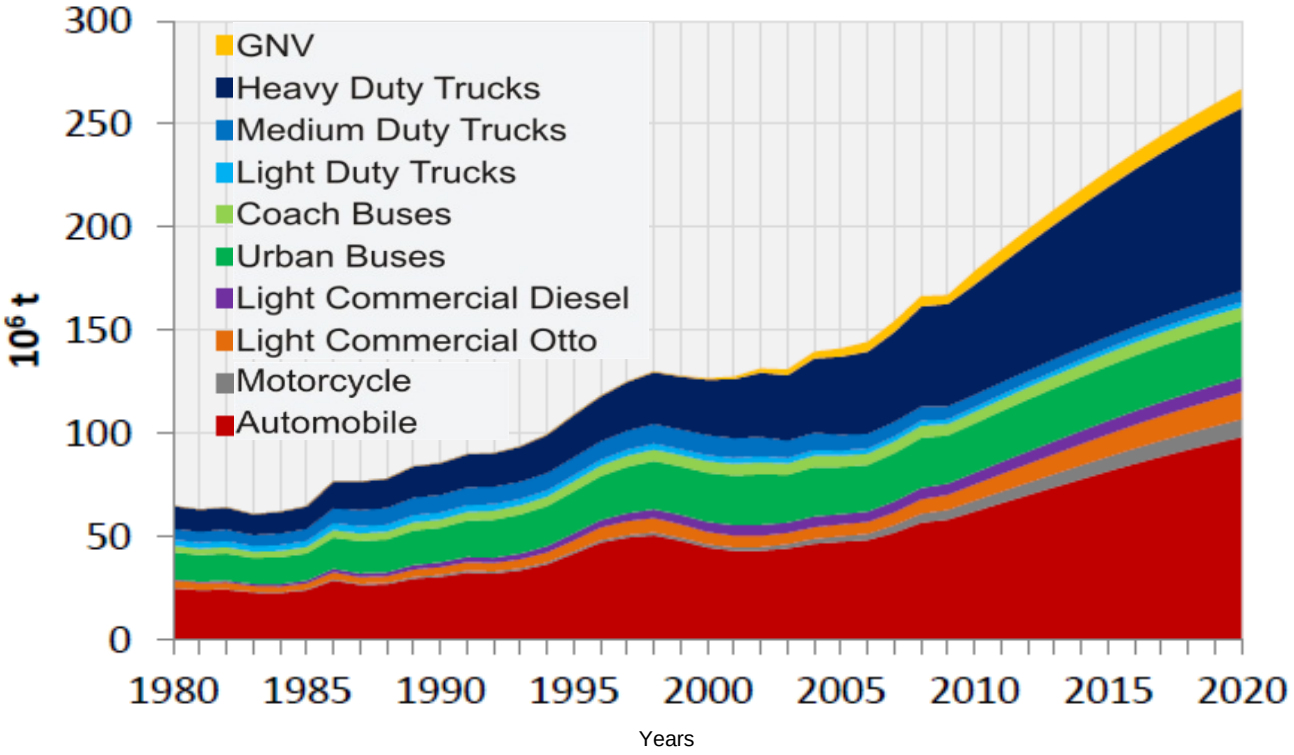
- Trucks account for 54% of total transport sector fuel consumption in China.
  - Road freight volume grew rapidly along with the fast growth of China's manufacturing-dominated economy.

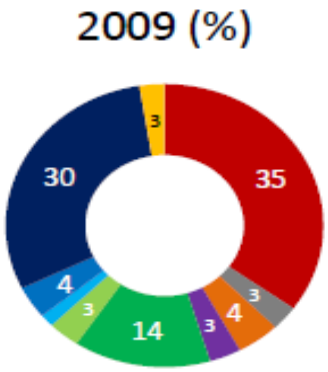


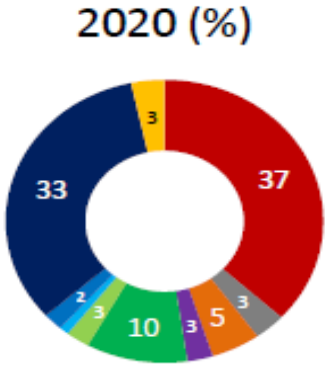


Freight Transport: Fast Growth, High Emissions

- Freight demand is expected to continue growing in the medium term
- Trucking is and will likely continue to be largest segment of sector
- Graph shows a projection of CO2 emissions by vehicle category and the growth of truck emissions stands out:



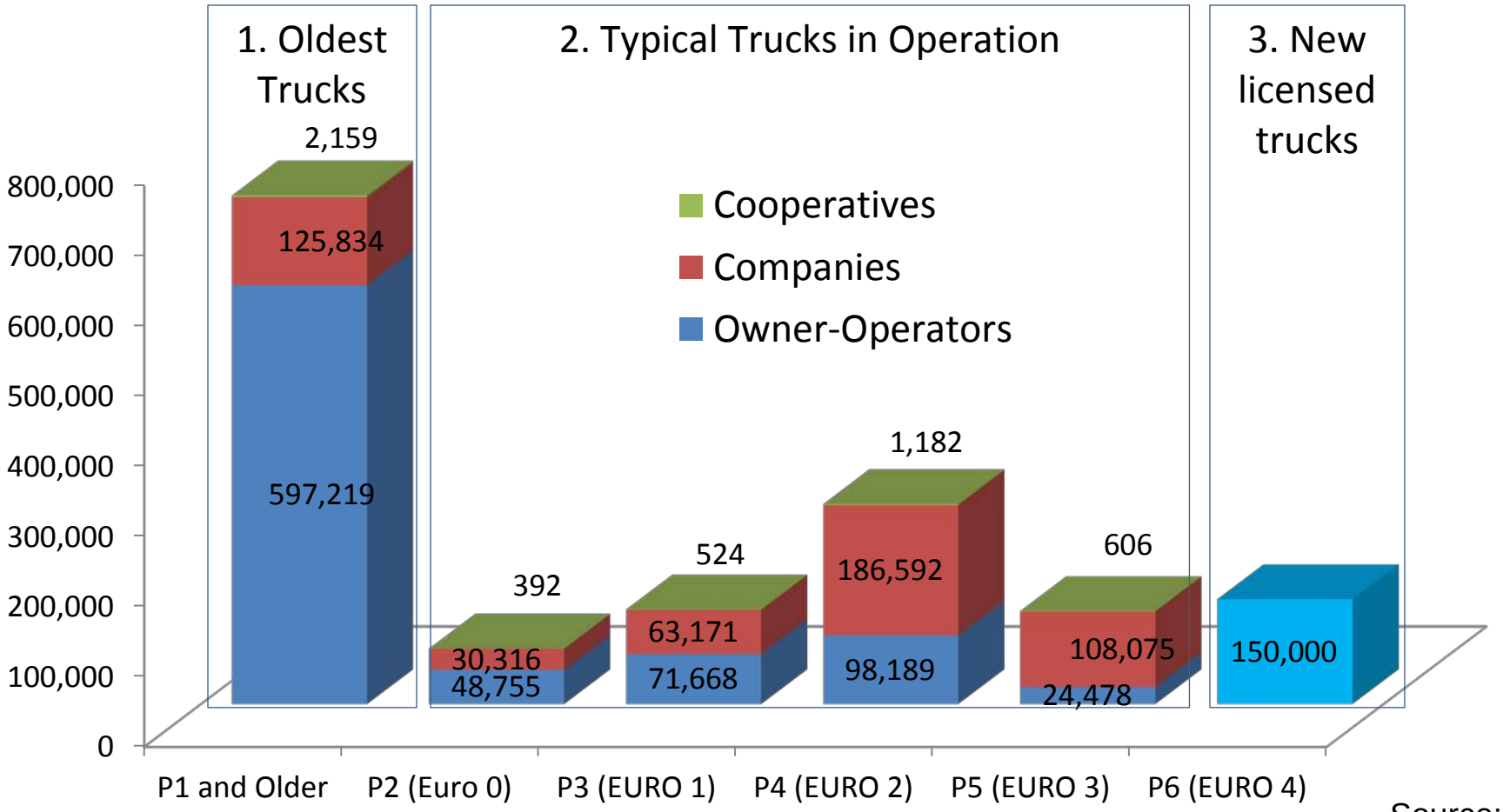




Source: Institute for Energy and Environment (IEMA), published by Brazilian Ministry of Environment, "1º inventário Nacional de Emissões Atmosféricas Por Veículos Automotores Rodoviários," January 2011.

Fleet and ownership

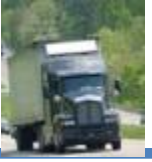
Brazil: Profile of fleet by engine/emissions technology and type of ownership divided into 3 segments:



Source: ANTT, 2009

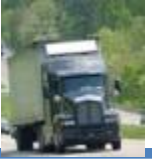
Sector situation in China, Brazil

- Tire pressure
  - Most drivers only use hammer to check tire pressure
  - 14% of drivers check pressure less than once per week
- Truck loads
  - Empty of partially empty trucks are common
  - Overloading is common
- Many cost-effective technologies available but not yet widely applied
  - Low rolling resistance tires
  - Aluminum wheels
  - Automatic tire pressure monitoring
  - Aerodynamics: e.g. skirts or nosecone
- Introduction of Euro IV fuel makes emission reduction technologies possible



China Green Freight Initiative

- Improve fuel efficiency of Chinese Trucking Sector
  - Sectoral targets for energy efficiency of GDP
  - Tentative regulatory steps
  - Sector not operating at global good practice levels
- Aiming to address the market failure by
  - providing better information and better confidence in the performance of proved energy efficiency technologies and practices,
  - increasing awareness and demand for energy efficiency technologies, and
  - facilitating the increase of the technology supply in Chinese market.



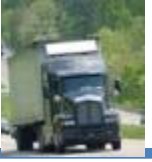
Step 1: Pilot Testing

- Carried out in Guangzhou, 2008-2009
  - Technology testing on 14 trucks in three truck fleets
    - Tire systems, Aerodynamics
  - EPA technical guidance, SmartWay™ contacts
- Test provided impetus for larger program
  - Best case 18% improvement and investment by fleet
  - Interest from provincial government in broader program

Step 2: Training and Overseas Study Tour

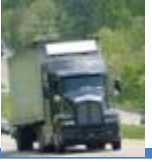
- Training workshops for government staff and enterprise management in Guangzhou
- Two-week tailor-designed training program (including site visits) in the US for senior officials
  - 17 directors, chiefs, and general mangers across different government agencies in Guangdong, learned about:

- Smatway Program (US EPA)
- Freight Logistics (CS Robinson, Safeway, Port of Tacoma)
- Emissions Policy (California Resource Board)
- Green Freight Technology & Financing (CSS)
- Vehicle Scrapping (Port of Seattle Truck Scrapping Program)



Step 3: Guangdong Demonstration Project

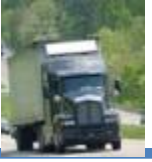
- Technology Demonstration
  - Large-scale truck technologies demonstration
  - Pilot testing logistics operation technologies:
    - Pilot Advanced Brokerage Information System
    - Pilot “Drop-and-Hook” freight operations
- Innovative Finance
- Large-scale Capacity Building



Green Truck Pilot Tests in Brazil

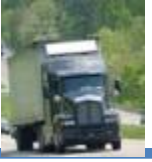
- Tests to provide evidence of efficacy in actual operations
  - Based on overview of technologies and practices
  - Selected to be robust, cost-effective, and widely applicable
  - Near-term fuel-efficiency package can be implemented on an average truck for less than US$4000
- Two 3-month tests have been designed and initiated:
  - Test 1: Green tires and aerodynamic deflectors with fleet in Anapolis (GO)
  - Test 2: Eco-driving training with fleet in Contagem (MG)

- Expected payback period of about 1 year for package tested, to be confirmed by test results.



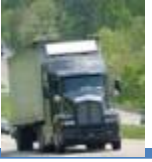
Recommendations for government

- Infrastructure
  - Continue leading and developing an environmentally-sound multi-modal integrated infrastructure system
- Fleet Renewal
  - Consider regulatory approaches and financial incentives to accelerate turnover of fleet
- Fleet Operations
  - Facilitate partnership approach on encouraging and recognizing voluntary efforts by private sector
  - Increase access to energy-efficiency financing and capacity-building
  - Mainstream good practices in operations/management
- Future Fleet
  - Support a culture of innovation in sector by re-examining regulatory structure
  - Support market-led innovation (sharing risks, lowering hurdles)



Proposed agenda for Bank support

- Near-term activities:
  - Evaluation and dissemination of ongoing pilot tests (October-Nov. 2011)
  - Providing technical input to National Climate Change Plan by extending the methodology used in the Low Carbon Study for fleet modernization strategies (December 2011)
  - Urban Freight management – OD Survey in São Paolo
- T.A. and policy dialog to support strategic and regulatory analysis:
  - Support development of a comprehensive “green freight” strategy
  - Designing a scrappage and replacement program
  - Institutionalizing freight sector energy-efficiency incentives and investments
- T.A. and policy dialog to support operational measures:
  - Designing a voluntary partnership model including certification, liaison, capacity building, and assessment
  - Designing an innovation program
- Pilots and small-scale financial support



Partnership based approaches

Partners and collaborators:

- Government: Transport, Environment, Regulatory agencies
- Manufacturers, Suppliers, Shippers, Carriers

ecofrotas

VIC

RIO VERMELHO DISTRIBUIDOR

CNT Confederação Nacional do Transporte

SEST SENAT Serviço Social do Transporte Serviço Nacional de Aprendizagem do Transporte

- Non-governmental Organizations, Trucking Federations, Academia

CLEAN AIR INITIATIVE for Asian Cities 2001-2011

CASCADE SIERRA SOLUTIONS

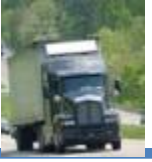
NTC & Logística Associação Nacional do Transporte de Cargas e Logística

Clean Air Institute

- SmartWay™ and US EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SmartWay Transport Partnership U.S. Environmental Protection Agency



Summary

- “Green Freight” increasingly core element of program
  - China and Brazil initiatives just the beginning
- SmartWay™ approach inspired China and Brazil initiatives
  - Technical guidance, contacts from SmartWay™ partners
  - USEPA valued for expertise, credibility

- Future: Common interests and opportunities for collaboration
  - Global Public goods
  - Harmonized monitoring and reporting protocols
  - Standards