The SmartWay Transport Partnership

International SmartWay Opportunities

March 10, 2009

SmartWay℠

Part 1:
Global Impact of Transportation

SmartWay℠

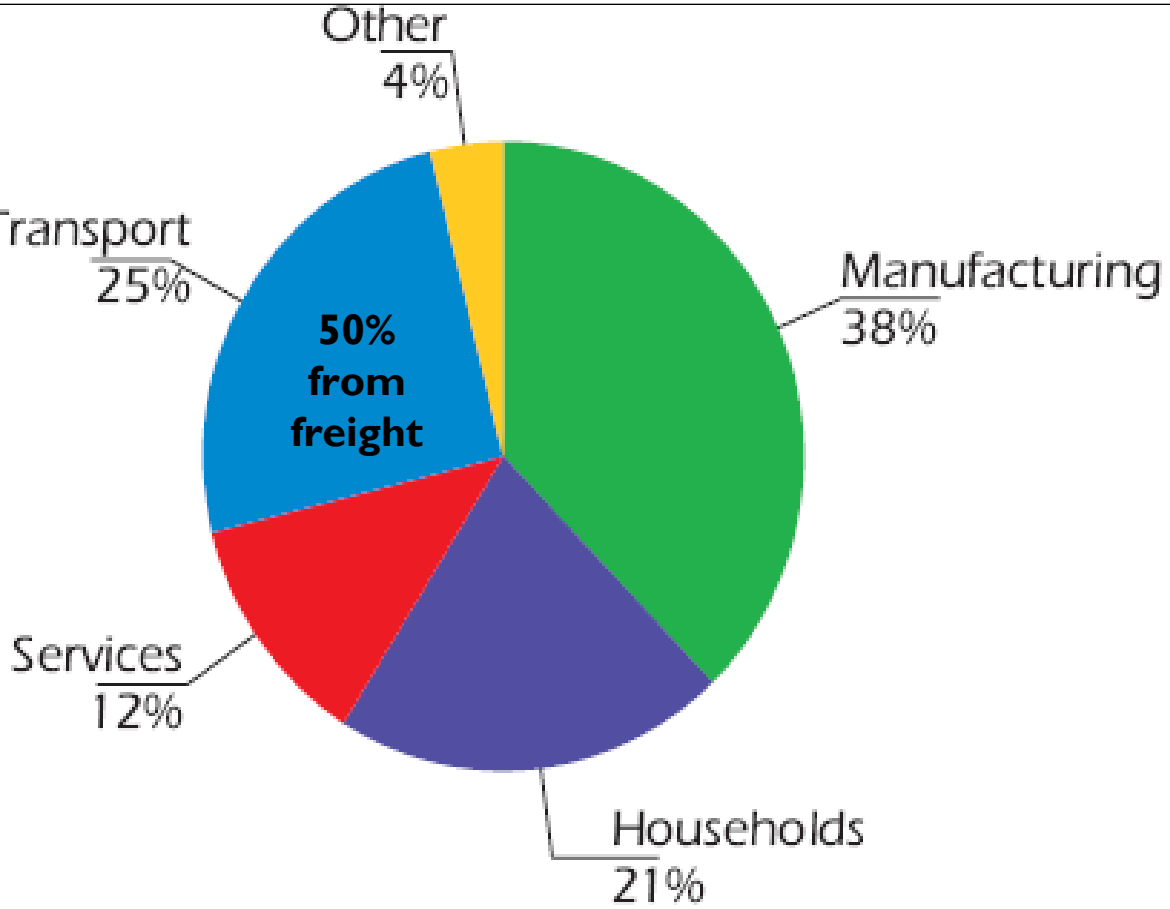
Global CO_2 from Transportation

- Total annual CO_2 from energy = 21Gt CO_2
  - All Transportation = 5.3 Gt CO_2
  - Freight Transport = 2.4 Gt CO_2
- Growth rates(1990-2005)
  - 30% growth in developed countries
  - 55% growth in less-developed countries
    - China tripled transport energy use (1990-2005)
- UNEP projects transportation will be 33% by 2050

SmartWay℠

Source: Worldwide Trends in Energy Use, International Energy Agency, 2008

Share of Global CO_2 by Sector

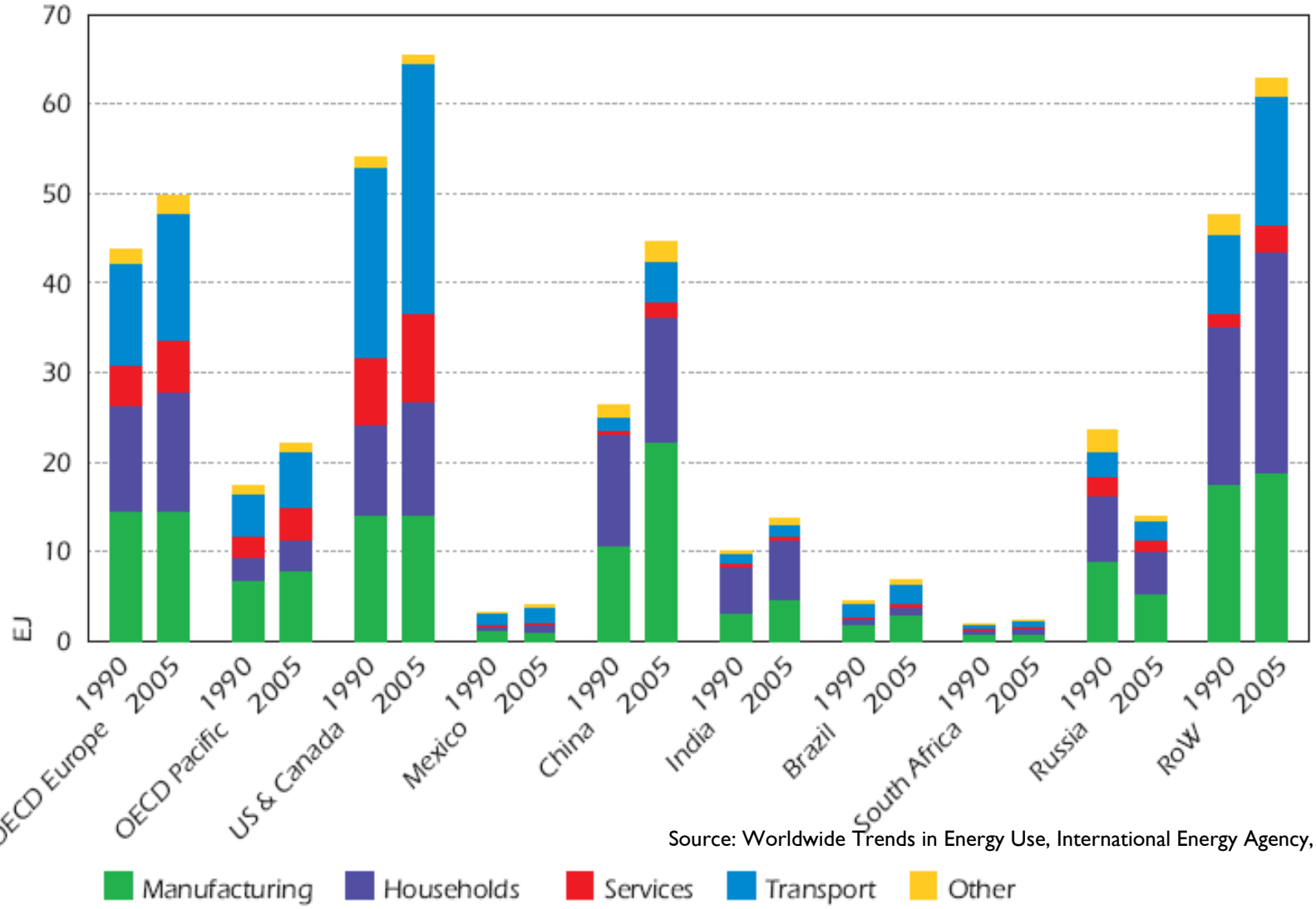


Total direct and indirect CO_2 emissions: 21 Gt CO_2

SmartWay℠

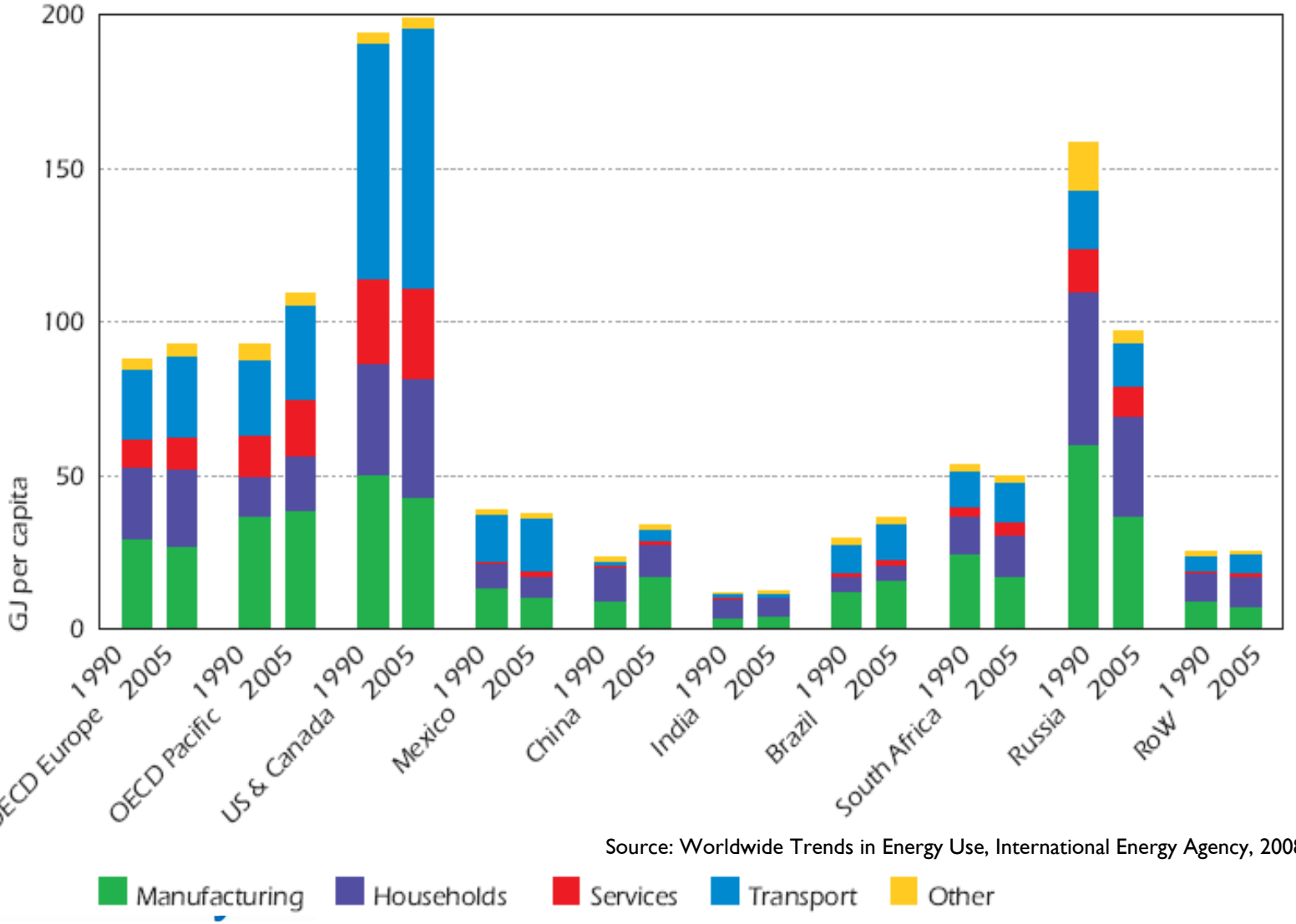
Source: Worldwide Trends in Energy Use, International Energy Agency, 2008

Total Global Energy Use by Sector



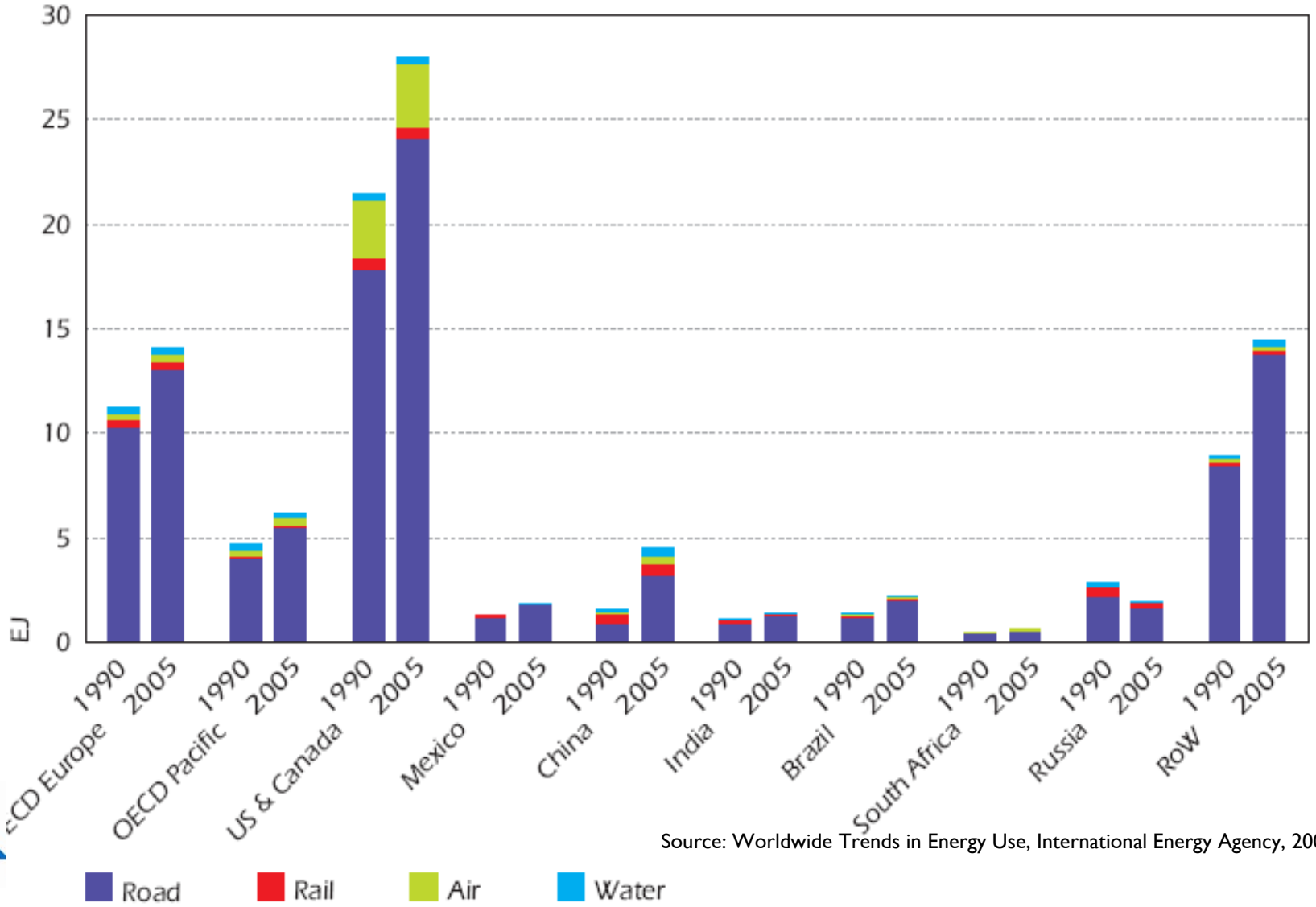
Source: Worldwide Trends in Energy Use, International Energy Agency, 2008

Per Capita Energy Use by Sector



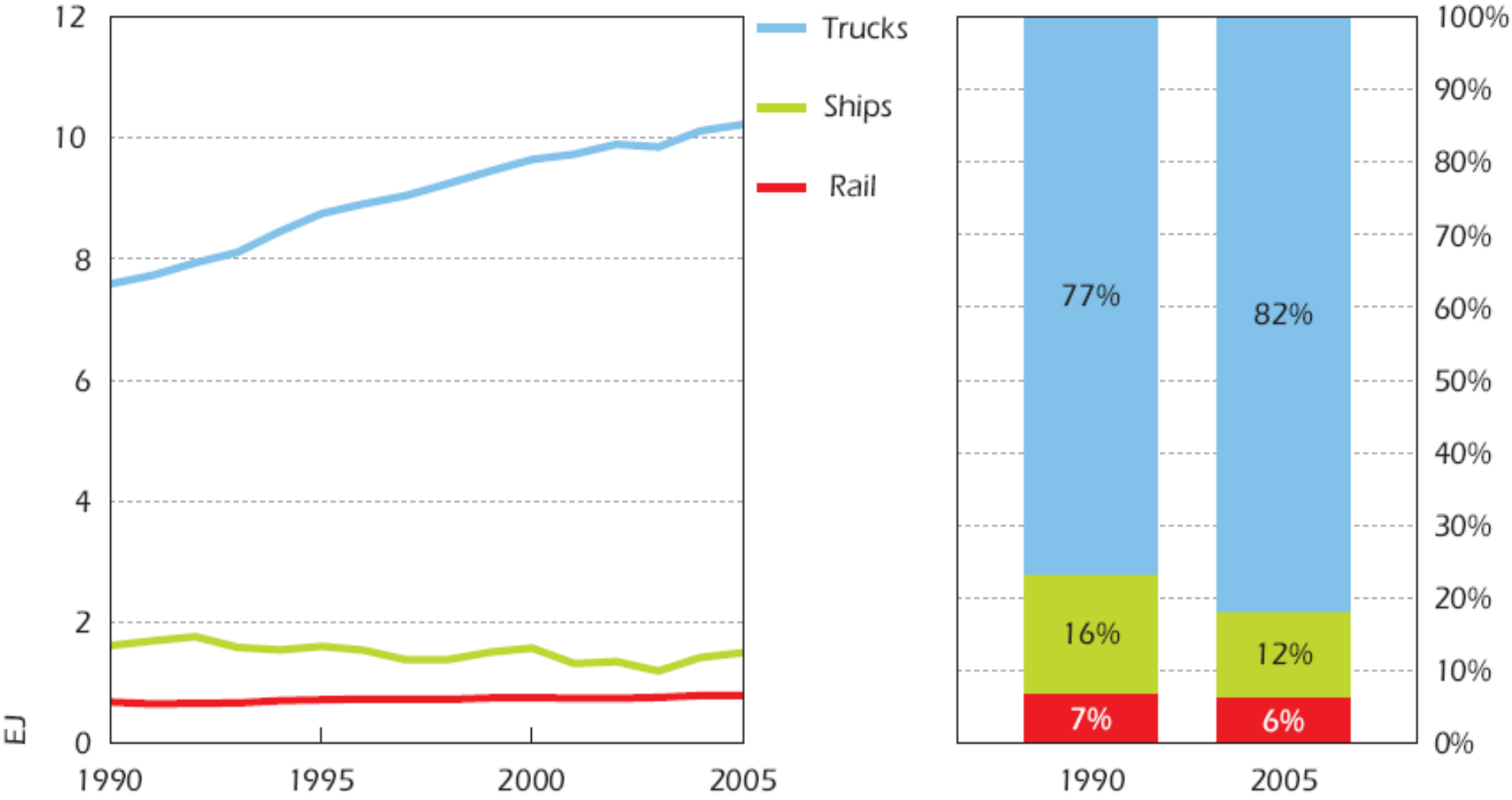
Source: Worldwide Trends in Energy Use, International Energy Agency, 2008

Total Global Transport Energy Use by Mode



Source: Worldwide Trends in Energy Use, International Energy Agency, 2008

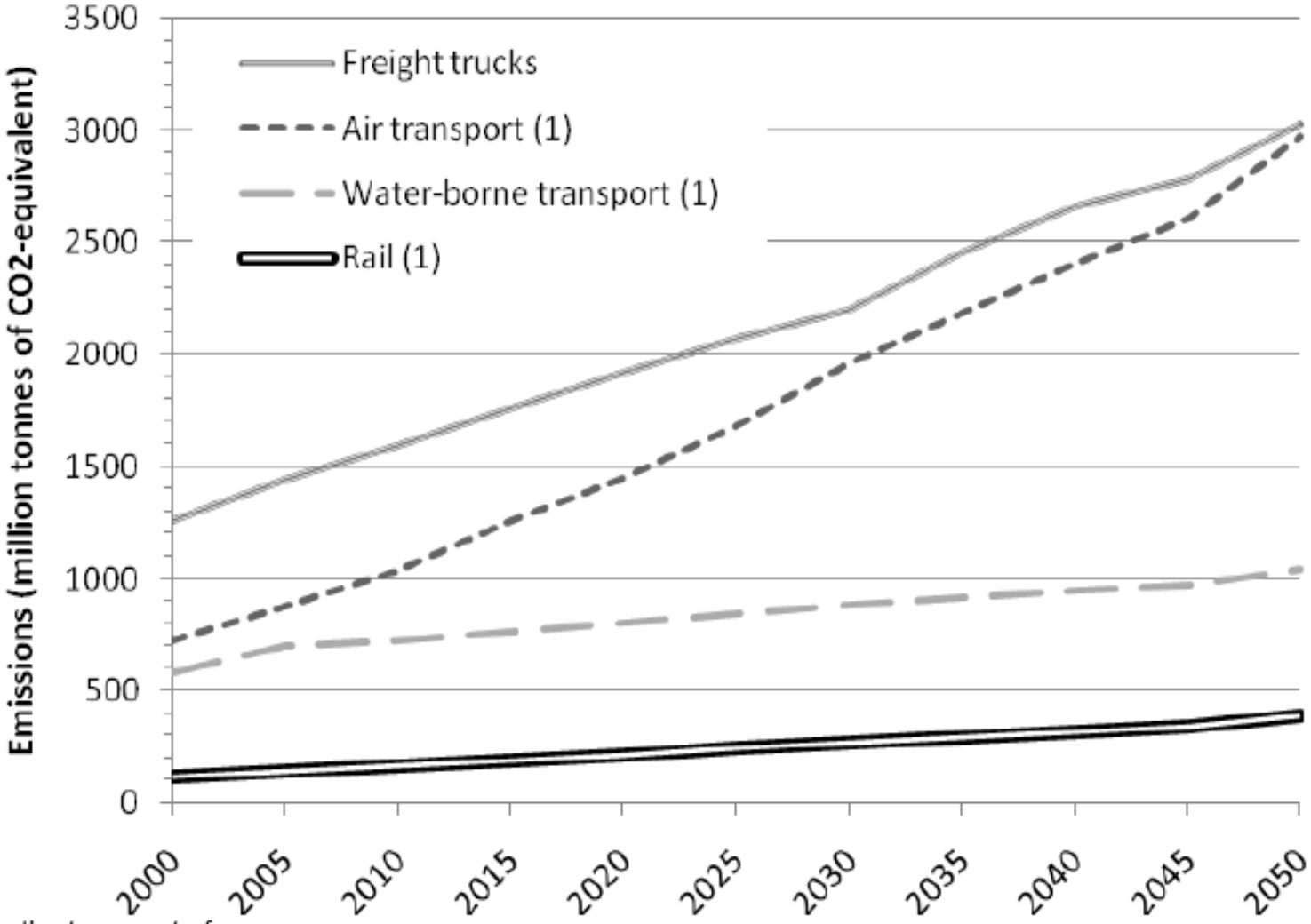
Modal Share of Global Freight Energy



SmartWay℠

Source: Worldwide Trends in Energy Use, International Energy Agency, 2008

World CO_2 Emissions by Transport Mode

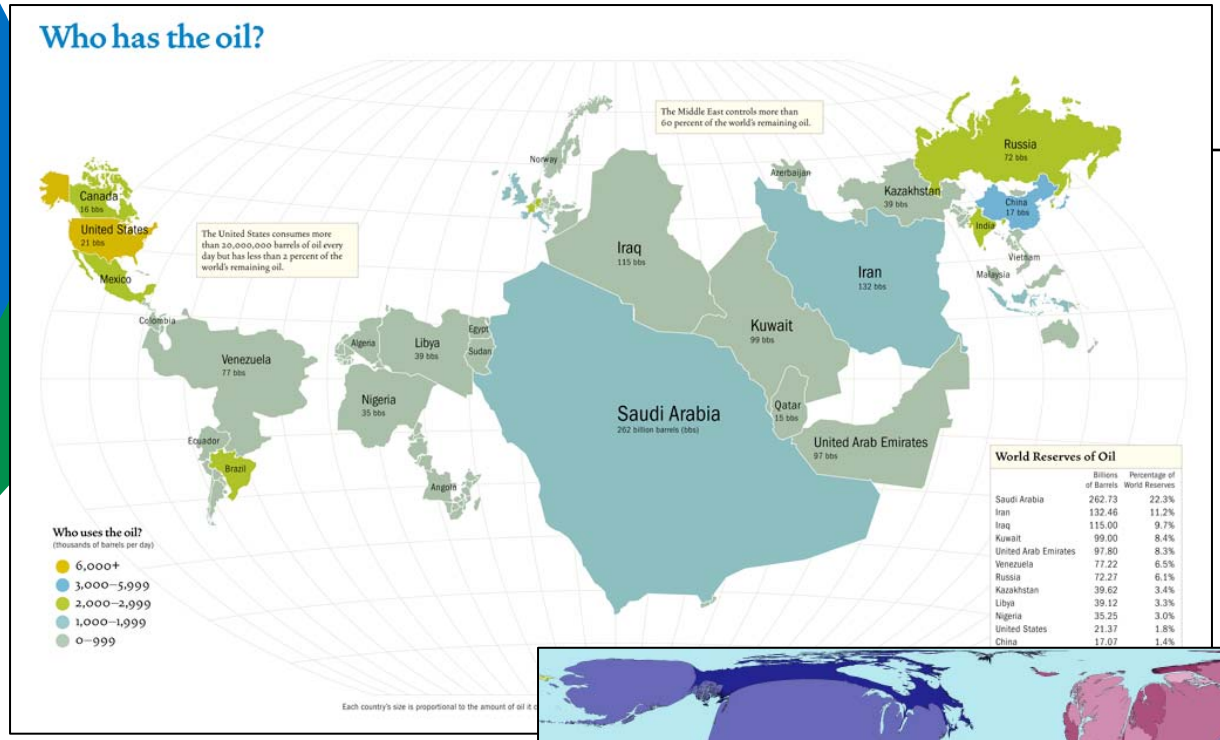


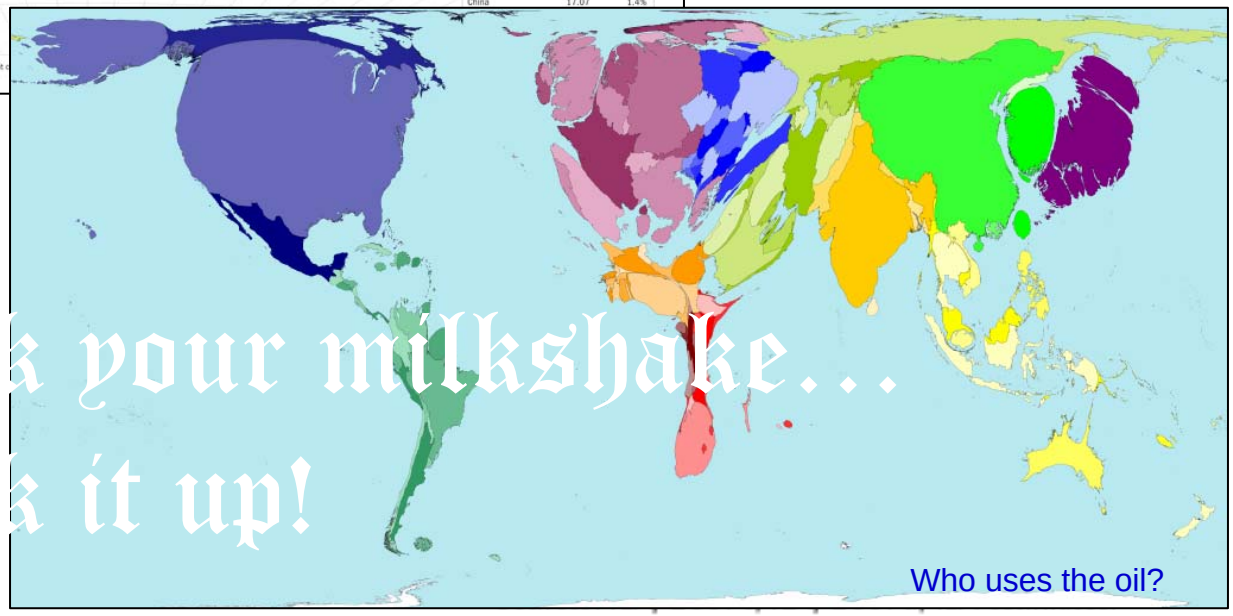
1. Including the transport of passengers.

Source: Adapted from JTRC (2008); ITF calculations using the IEA MoMo Model Version 2008.

OECD Joint Working Party on Trade & Environment: Interim Report, Nov. 2008

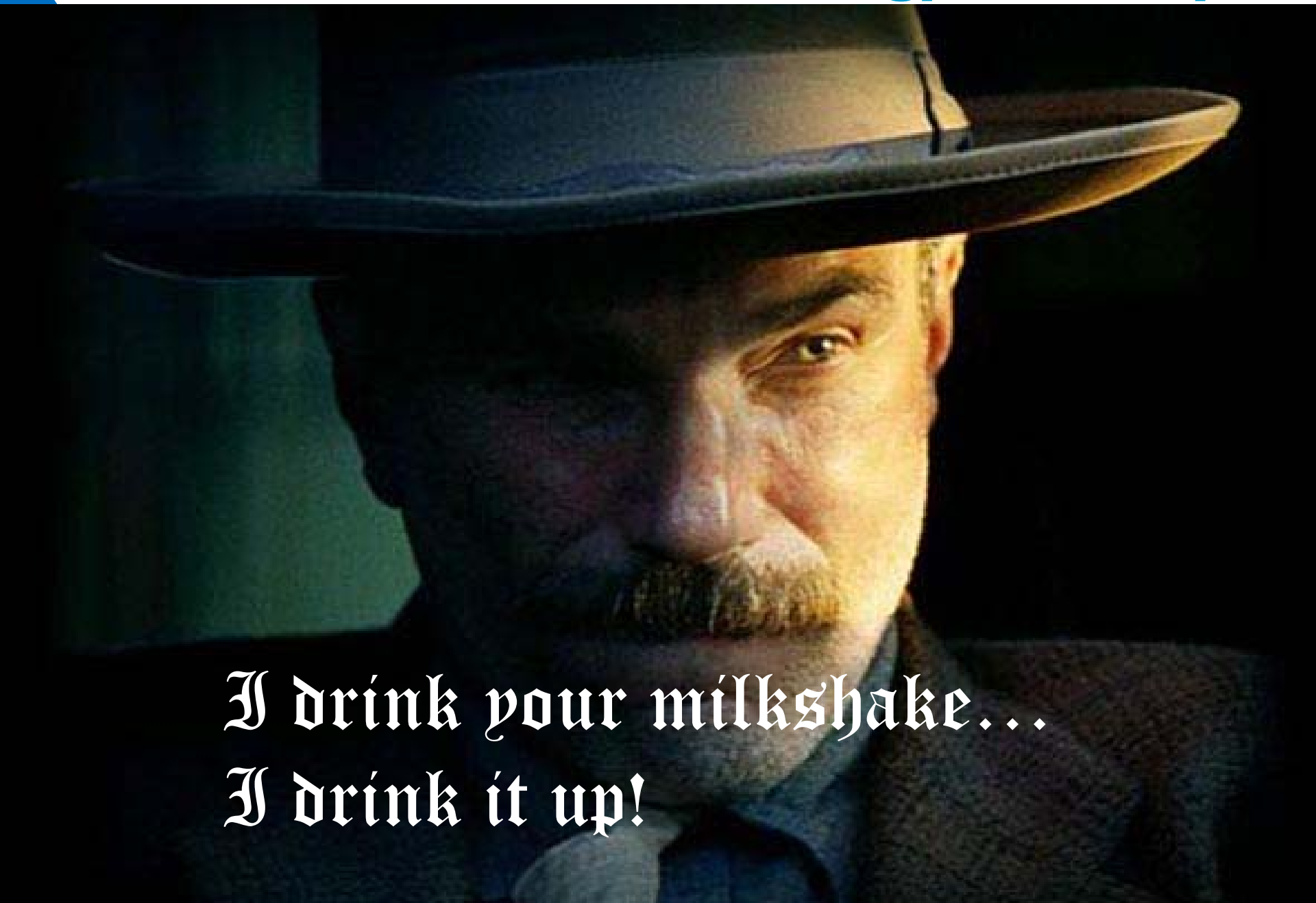
Energy Security





SmartWay℠

Energy Security



Climate Change & International Security

Climate change determined by EU to be a new factor in global tensions
- Report presented to European Summit in Brussels March ‘08

“Climate change has become a threat multiplier which exacerbates existing trends, tensions and instability,"

- Economic Damage and Risk to Coastal Cities & Infrastructure
- Conflict over Resources
- Loss of Territory and Border disputes
- Environmentally Induced Migration
- Situations of Fragility & Radicalization
- Tension over Energy Supply
- Pressure on International Governance

* Russian scientific expedition plants flag on the ocean floor, staking claim to the resource-rich region under the polar ice cap. Vladimir Putin decorated the team with "Hero of Russia" medals.

SmartWay℠

Part 2:
Global Opportunities for GHG Savings from Goods Movement

SmartWay℠

Air Cargo GHG Reduction Strategies

- Carrier operational:
  - Vectoring w/GPS (better routing)
  - Better air traffic control to reduce vertical separation minimum
  - Continuous descent approach
  - Reduce congestion (i.e. time waiting to land)
  - Pay to advance position in landing queue (e.g., 747 pays to land before Cessna)
  - Reduce or eliminate engine use during taxiing
  - Reduce or eliminate engine/APU use at the gate (e.g. through gate electrification)
  - Reduce engine thrust and reverse thrust during take-off and landing (e.g. by lengthening runways)
  - Reduce "tankering" (i.e. buying fuel in one place for multiple trips)
  - Reduce weight of onboard components e.g. duty-free, water tanks, magazines
  - Reduce back-haul (empty aircraft space)
  - Reduced speed
- Technologies:
  - Increase engine efficiency
  - Improve aerodynamics, adding winglets or spiroids at tip of wings, using less paint, adding film or other materials to surface of planes, etc.
  - Reduce aircraft frame weight
- Biofuels
- Shipper operational – reduced packaging

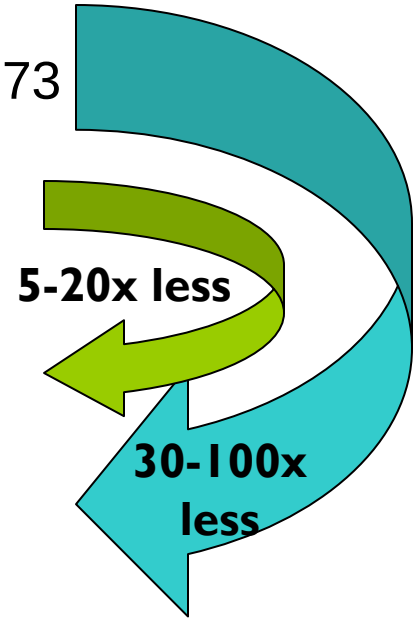
SmartWay℠

Maritime GHG Reduction Strategies

- Carrier Operational:
  - Routing and logistics improvements
  - Reduced speed
  - Reduced docking times
- Vessel Design:
  - Hull design and coatings
  - Improved propulsion systems
  - Improved propellers
  - Improved engines and rebuilds
  - Slide valves
- Energy Supply
  - Supplemental power by wind and solar
  - Alternative fuels
  - Hybrid propulsion systems
  - Fuel cells
  - Cold ironing, in port
- Shipper Operational
  - Reduced packaging
  - Optimized palletization and cube

SmartWay℠

Potential CO_2 savings from Modal Shifts



	CO_2 g/tonne-km*	Total yearly global tonnes freight* CO_2	With 20% Intermodal shift
Air	501 to 1073	115 million	92 million
Truck	50 to 333	1.5 billion	1.2 billion
Rail	17 to 74	200 million	230 million
Ship	11 to 14	650 million	651 million
Total		2.465 Gt CO_2	2.173 Gt CO_2

Savings = .292 Gt CO_2

*OECD Joint Working Party on Trade & Environment: Interim Report, Nov. 2008

Case Studies on International Modal Shift

REI implemented aggressive modal shift for international air cargo to sea container

- 2005 - 2008 saved 238,000 tons CO_2

IBM 2006 carbon footprint analysis

- Air Cargo footprint = 20,000 tons CO_2
  - Based on IBM study of CO_2 emissions from outbound logistics transport using IBM's Carbon Trade-off Modeler
  - IBM study included 250,000 shipment records from six product families for North American routings
  - 18% total ton-miles but 71% total carbon footprint
  - 25% modal shift (air/truck) will save over 4,000 tons CO_2

HP shifted notebooks from air to sea (2007) and rail to truck on domestic shipments

- Saved 7,500 tonnes of CO_2

SmartWay℠

Global opportunities to Address CO_2 From Goods Movement

- No existing global controls on GHGs from ships or aircraft outside international boundaries
- International Maritime Organization (IMO) and International Civil Aviation Organization (ICAO) are exploring market based mechanisms for achieving GHG reductions
  - SmartWay added to USG submission to IMO
- European stakeholders discussing development of a SmartWay platform with the European Commission and the European Environment Agency
- Global SmartWay 2.0 can be platform for significant, market based GHG reductions.

SmartWay℠

SmartWay as Platform for International Freight Sustainability Efforts

- UNEP studying SmartWay model
- Partnership for Clean Fuels and Vehicles,
  - Fleet Management Toolkit
  - http://www.unep.org/tnt-unep/toolkit/
- Clean Air Initiative - Asia
  - Studying SmartWay for Green Trucks Project in China, to prepare for 2010 World Expo
- APEC and Alliance to Save Energy
  - Highlighting SmartWay as model for Asia
- North American Super Corridor – NASCO
  - Promoting SmartWay model along CAN-US-MEX trade corridor

UNEP

Asia-Pacific Economic Cooperation

nasco

SmartWay℠

Part 3:

The SmartWay International Summit

SmartWay℠

The SmartWay International Summit

Dec 2-4, Ann Arbor at U. of Michigan and NVFEL

- Developed in response to countries asking for guidance to develop and launch their own "SmartWay" programs
- Representatives from 12 countries

Belgium	**Australia**
France	**Canada**
Netherlands	**India**
Sweden	**Japan**
Switzerland	**Mexico**
UK	**New Zealand**

- Other key organizations included:
  - World Resources Institute
  - Environmental Defense Fund
  - Carbon Trust
  - Massachusetts Institute of Technology
  - US Maritime Administration
  - EPA Office of International Activities

SmartWay℠

The SmartWay International Summit

Goals:

- Training countries to set up SmartWay sister programs
- Sharing best practices from other countries' programs
- Harmonizing supply chain GHG accounting methods
- Developing an international SmartWay Exchange Network

Key Partners and Stakeholders:

- University of Michigan Transportation Research Institute
- Sustainable Mobility, Accessibility Research & Transformation (University of Michigan)
- MIT Center for Transportation & Logistics
- ATA
- SmartWay Shipper and Carrier Partners

Key Elements:

- Full-day workshop for countries building "SmartWay" programs
- Tour of EPA Lab & SmartWay Technology Showcase
- Keynote speaker Andrew Savitz – Triple Bottom Line

SmartWay℠

SmartWay Summit Results

- SmartWay recognized as global leader in public-private partnership to address transportation GHG
- Many nations working to address freight sustainability see SmartWay as model program
  - Countries looking to EPA for guidance, best practices
  - Many global efforts, at varying levels of implementation
    - Voluntary, taxation and regulatory
    - Fledgling programs and fully established programs
- Business and governments world-wide are looking for harmonized GHG accounting systems
  - Urgency do to intersection of economy, environment, energy security
- Consensus on international platform to share data, info and best practices
  - SmartWay Exchange Network
  - Harmonization with WRI GHG protocol

SmartWay℠

Emerging Opportunities

- Launch SmartWay Supply Chain globally via a SmartWay International Exchange Network:
  - SmartWay "sister" programs in other countries
  - WRI – EPA harmonizing metrics with GHG protocol
- Broaden working relationships with:
  - MIT – Study SmartWay recommendations
  - UMTRI and SMART (University of Michigan)
- Explore feasibility of annual SmartWay event
  - Combined with broader SmartWay themes
    - Awards, Technology Assessments, Finance, etc.
- Open channels for ongoing dialogue:
  - Establish communication forums, e.g., webinars, blog
  - Share best practices, data, GHG strategies

SmartWay℠

Establishing the SmartWay International Exchange Network

Option 1 (High): US EPA SmartWay Certified Supply Chains

- SmartWay applied across global supply chain
- Certified/verified fuel saving, freight sustainability practices
- Requires data submission to central database, third-party validation
- Goal = verified, multimodal data on global goods movement
- Goal = SmartWay brand established as global standard

Option 2 (Medium): SmartWay "Global Partners" program

- Highly visible, global application of SmartWay
- Focus is carbon footprint analysis, modal and carrier optimization
- Central database links supply chain modeling for shippers, carriers, govt's
- Goal = GHG savings tracked with EPA database

Option 3 (Low): SmartWay International Consortium

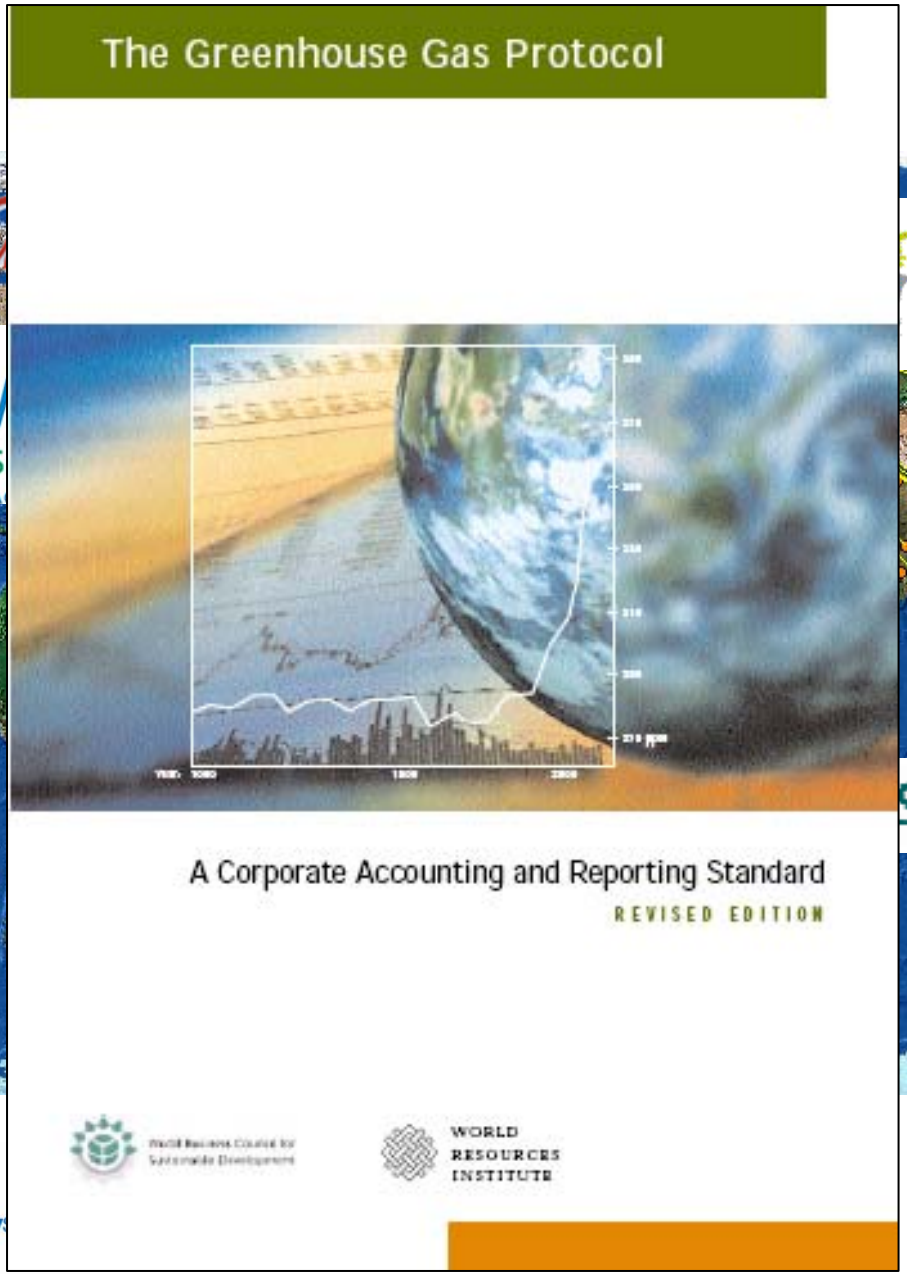
- Visible application of SmartWay
- Modeled after current SmartWay Affiliate program
- Goal = global brand awareness, education, sharing best practices

SmartWay℠

Global Freight Sustainability Efforts

SmartWay℠

Global Freight Sustainability Efforts



FleetSmo

SmartW
Transport Partners
U.S. Environmental Protection A

Transporte Limpio
Semarnat

connekt

JITI

stPractice

SmartWay

SmartWay℠ Transport Partnership

U.S. Environmental Protection Agency

www.epa.gov/smartway

smartway_transport@epa.gov

phone center 734-214-4767

Buddy Polovick 734-214-4928

SmartWay℠