A Global Perspective on Greening the Transport Sector

Sustainable Mobility and Integrated Planning in Urban Areas

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Even in the most optimistic scenarios, transportation is expected to be highly dependent on oil in the next two decades.

**2010 Transport Energy Consumption**
- Diesel: 28%
- Gasoline: 46%
- Jet: 13%
- LPG/CNG: 7%
- Residual: 1%
- Biofuels: 4%

**2030 Transport Energy Consumption**
- Gasoline: 39%
- Jet: 18%
- LPG/CNG: 18%
- Residual: 6%
- Biofuels: 3%

94% fossil sources
Total = 2,200 Mtoe

76% fossil sources
Total = 2,500 Mtoe

Source: IEA / SMP, IMO, IATA, Carbon Neutral Skies team analysis, Repowering Transport team analysis
**Opportunities & Challenges**

- **Increased demand for mobility**
- **New technologies** (electric vehicles, biofuels)
- **New types of players** (IT, mobile, social)
- **Government policy** (job creation, energy, transportation, agriculture)
- **Customer behavior** (efficiency, integration, sustainability)
- **Other exogenous factors** (economic shocks, resource scarcity, inertia)

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**Transportation System**

- **Road**
- **Air**
- **Marine**
- **Rail**

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**Environmental impact**

- GHG emissions: transportation represented 23% of global emissions in 2005 and the share is growing
- Impact on land-use change and water consumption

**Economic impact**

- Economic development and growth
- Job creation in transportation and adjacent sectors
- Profitability of stakeholders along the value chain

**Social impact**

- Job creation in transportation and adjacent sectors
- Impact on poverty reduction
- Impact on energy security

Source: World Economic Forum
Principles shared by all stakeholders support an integrated systems approach to sustainability in transportation

Guiding principles for environmental sustainability in transportation

- Policy framework should:
  - Consider implications on other modes and sectors
  - Be transparent, predictable, coordinated
  - Provide appropriate support for sustainable technologies

- Financing decisions should consider:
  - Long-term social, environmental, and governance factors
  - Opportunities for collaborative de-risking
  - Financial aid as opportunity for economic growth

- Energy sources should be:
  - Cost effective and sustainable
  - Sustainable from environmental, social and economic perspective
  - Measured based on harmonized life-cycle environmental assessments

- Infrastructure investments should consider:
  - Ability to improve utilization and integrate existing infrastructure
  - Trade-offs between technologies and impact on other modes
  - Impact on urban planning and programs in other sectors

- End customers need:
  - Access to sustainable transportation alternatives
  - Information on life-cycle environmental impact and cost
  - Information that is granular, verifiable, available, comparable, and understandable

Source: World Economic Forum, Sustainable Transport Ecosystems
The principles can be applied to develop action plans for specific sustainability levers in transportation

Example: Vehicle electrification

### Policy makers
- Financial and non-financial support and incentives (e.g. zero emission zones, bus/taxi lanes)
- Mandating government fleets as early adopters
- Educate consumers (e.g. TCO)

### Financial institutions
- Develop new financing models
- Build in-house capabilities around e-technologies to ensure attractive market offerings
- Foster and encourage start-up players

### Academia
- Invest in R&D of more sustainable technologies

### Energy providers
- Develop commercial offerings to support mass-market adoption
- Support collaboration with industry peers and start-up players

### Energy providers
- Identify bottlenecks in distribution/last mile and upgrade grid

#### Policy Makers
- Review electric grid regulation to ensure cost efficient and speedy deployment
- Expand public charging infrastructure.
- Collaborate to push technology standardization

#### Industry organizations/NGOs/OEMs
- Educate total cost of ownership of vehicles

### End customers
- Push OEMs for transparent information
- Communicate need for infrastructure

Source: World Economic Forum, Sustainable Transport Ecosystems
Potential beyond traditional transport technologies is mainly expected from new ICT and consumer trends.

Megatrends

- Cloud Solutions/Big Data Analytics
- Mobile Connectivity 3.0
- Internet of Things/Smart Transport
- E-/M-Commerce & Multichannel Retail
- Social Media/Web 2.0
- Information & Entertainment Everywhere
- Emergence of Megacities
- Seamless User Experience

Solutions for connected mobility

Benefits to society (by 2025)

- Condition-based megacity traffic management
- Tracking- and transparency-based logistics optimizer
- Fully automated check-in, security and border control
- Integrated proactive intermodal travel assistant

Business opportunity (by 2025)

Source: World Economic Forum, Connected World