Transport, Energy and CO2: Moving Toward Sustainability

Lew Fulton, IEA

Global auto makers event at COP 15

Copenhagen, 14 December 2009

IEA and transport

Relevant publications

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

- World Energy Outlook (WEO)
  - Horizon 2030, 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

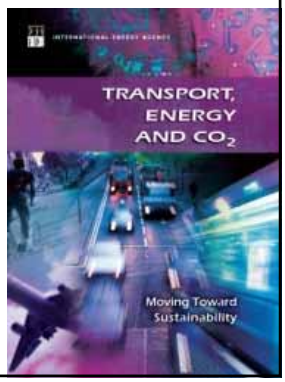
- Energy Technology Perspectives (ETP)
  - Horizon 2050, all energy sources
  - Scenarios that pay particular attention to the role of technology, especially on the demand side
  - One underlying assumption for GDP and population growth

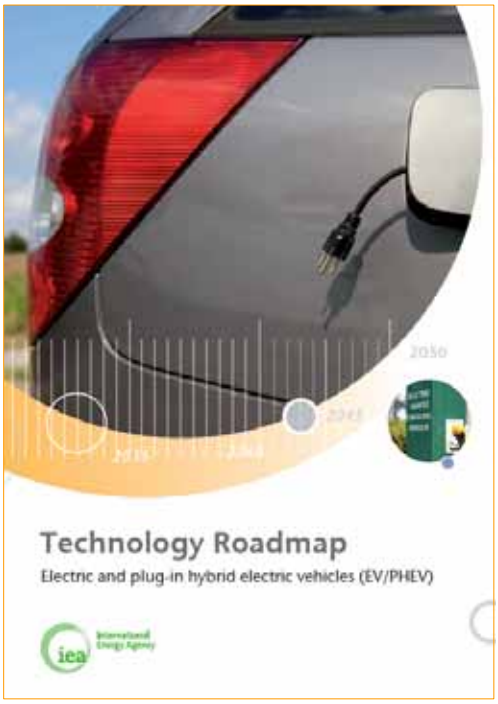
- Transport, energy and CO_2 ***Just Out!***

  Moving towards sustainability
  - "Transport book"
  - Horizon 2050, all energy sources
  - Builds and expands the work done on ETP

IEA's New Transport Publication

- Released 27 October, 2009
- Builds on ETP 2008, will feed into ETP 2010
- Transport analysis based on on-going development of IEA Mobility Model, supporting research
- Book features:
  - Indicator update and extension to more countries
  - Technology potential and cost updates
  - Fuel and Modal assessments (LDV, truck, aviation, shipping)
  - Detailed scenario analysis with regional detail – Baseline, High Baseline, Modal Shift, BLUE technology scenarios
  - Role of future technologies, modal shift
  - More regional detail than in ETP
  - Continuing development of CO2 mitigation cost analysis
  - Policy considerations

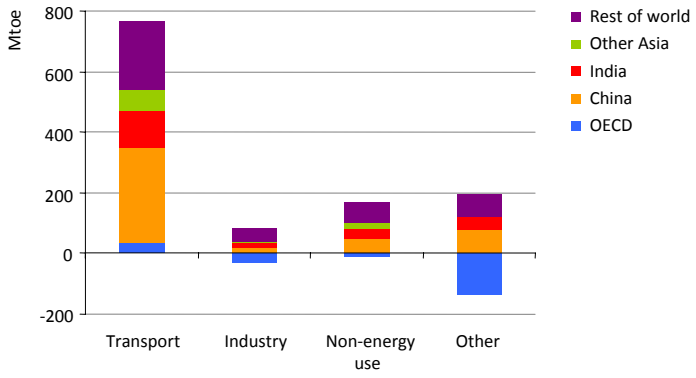




IEA *Electric and Plug-in Hybrid Vehicle Roadmap* published October 2009

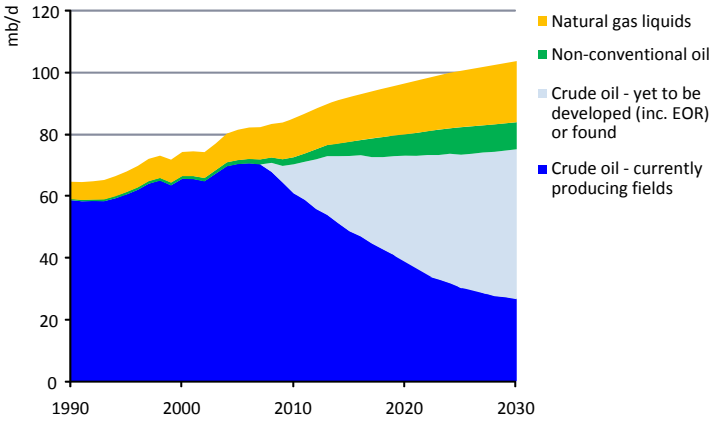
www.iea.org

WEO 2008 Reference Scenario: Incremental oil demand, 2006-2030



Around three-quarters of the projected increase in oil demand comes from transportation

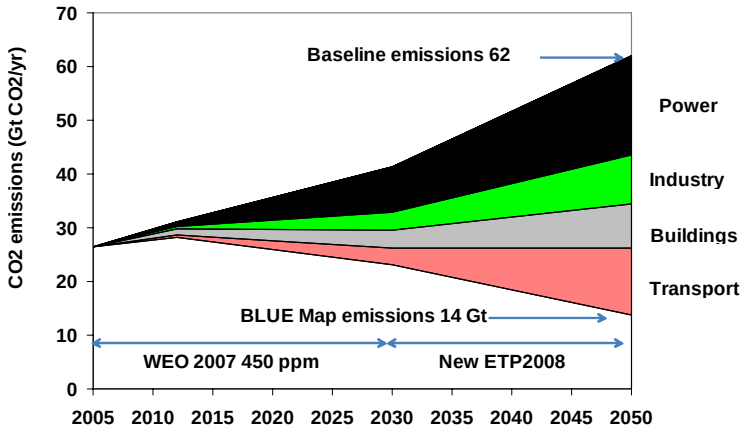
World oil production by source in the Reference Scenario



64 mb/d of gross capacity needs to be installed between 2007 & 2030 – six times the current capacity of Saudi Arabia – to meet demand growth & offset decline

We need a global 50% CO2 cut by 2050

IEA ETP 2008: Where reductions come from



How do we get there? The IEA ETP BLUE Map approach

1. **Integrated transport planning and investment**
   - 25% reduction in growth of car use/air travel by 2050
   - Doubling of investment in and use of transit systems compared to baseline
   - Some motorised transport avoided (shorter trips, more walking/cycling, telematics)

2. **Achieve 50% reduction in new car fuel intensity by 2030 (doubling of MPG and KM/L)**
   - From about 8 L/100km down to 4
   - Existing, commercial technologies
     - including hybrid vehicles, better components, light weighting
   - With fuel savings, net cost from a societal perspective will be low or even negative
   - Also 30-50% improvement potential for other modes (trucks, trains, ships, planes)

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How do we get there? The IEA ETP BLUE Map approach

3. **Widespread introduction of advanced technology vehicles by 2030, dominance by 2050**
   - ETP BLUE Map: EVs/PHEVs reach sales of 7 million by 2020, 30 million by 2030
     - Fuel cell vehicles start ramp up after 2020
   - Battery costs are dropping, must reach USD 300/kWh by 2020
   - Plug-in hybrids (PHEV) are a promising transition strategy
   - Low GHG electricity/hydrogen must be widely available by 2030

4. **Use of advanced biofuels**
   - Reach 12% of transport fuel by 2030, 25% by 2050
   - Feedstocks from residues, wastes, dedicated lignocellulosic crops
   - Must resolve land use change, soil carbon, ecosystem, food security issues

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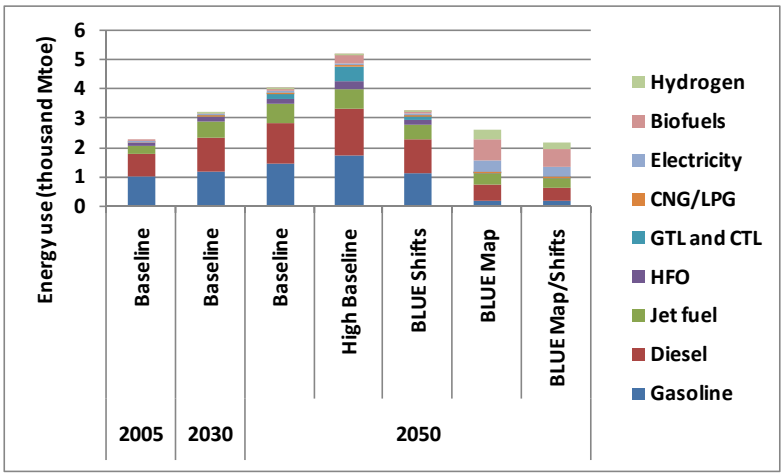
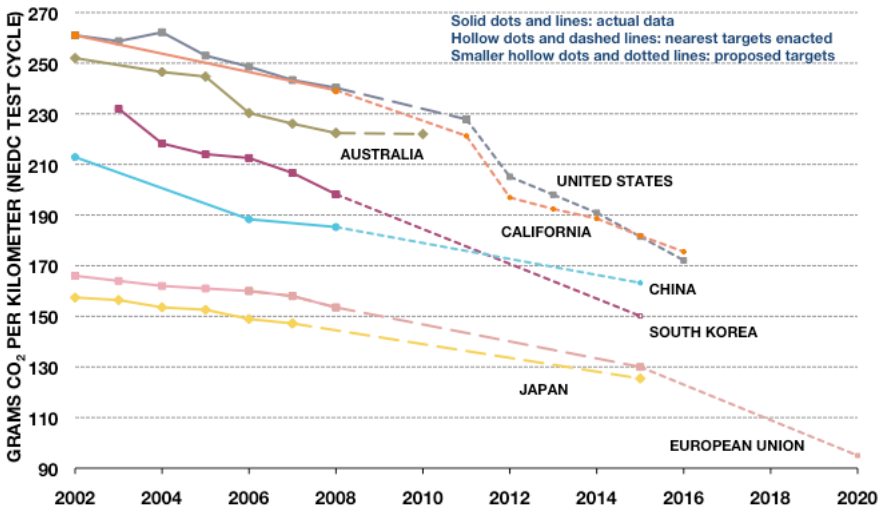
Energy use by scenario

In ETP BLUE Map/Shifts scenario, energy use returns to 2005 level, with more than 50% very low CO2 fuels



ACTUAL FLEET AVERAGE GHG EMISSIONS DATA THROUGH MY2008 AND NEAREST TARGETS ENACTED OR PROPOSED THEREAFTER BY REGION



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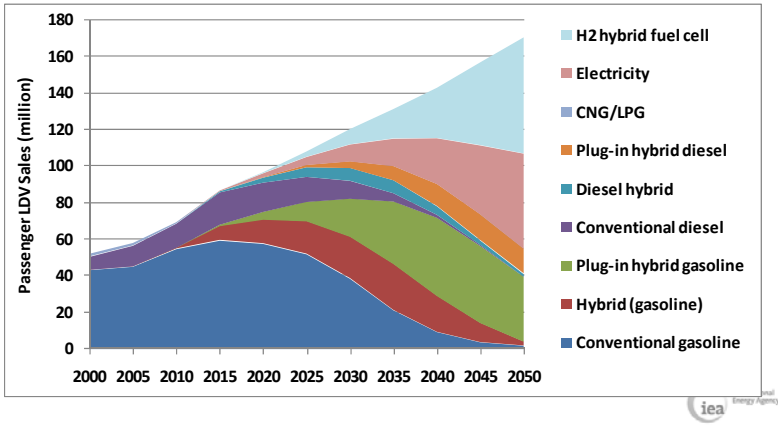
IEA ETP BLUE Map: advanced technologies must play a major role

Unprecedented rates of change in market penetration of advanced technologies



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IEA work on vehicle efficiency

Linked to the Global Fuel Economy Initiative (GFEI)

- Launched on 4 March 2009 in Geneva by IEA, ITF, UNEP, and the FIA Foundation

50BY50 GLOBAL FUEL ECONOMY INITIATIVE
www.50by50campaign.org

FIA Foundation

UNEP

- GOAL: 50% reduction in fuel consumption per km of 2050 (for the vehicle stock) compared to 2005
- Roughly equivalent to an implementation of a 50% improvement by 2030 for new sales, worldwide (from about 8 L/100km down to 4)
- Four main activity areas:
  - Analysis of global fuel economy trends and potential
  - Outreach to governments, assistance in policy development
  - Outreach to stakeholders, dialogue to improve coordination
  - Information campaigns

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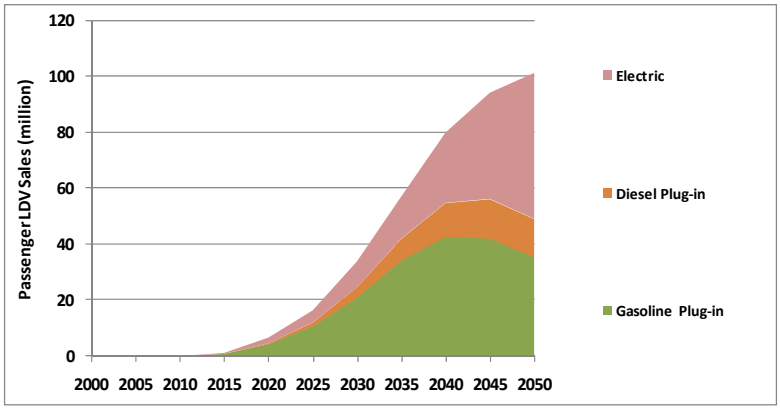
BLUE Map EV / PHEV sales trajectory to 2050

How can we achieve this?



Annual sales targets:
2020: 7 million: e.g. 70 models selling 100,000 each
2030: 30 million: e.g. 150 models selling 200,000 each
2050: 100 million: e.g. 400 models selling 250,000 each

Um, Policies?

- Clearly we will need strong policies both internationally and at national levels (and local!)
  - (cross sectoral) cap and trade – yes, but time to implementation might be long
  - Carbon price – yes, but $50/tonne is only $0.12/litre for gasoline
  - Bigger price changes can be achieved in many countries just by removing subsidies
- National measures should include:
  - Major increase in investments in the most efficient modes and related infrastructure
  - Fuel economy standards on all types of vehicles – 30-50% reductions in energy intensity by 2050 seem possible for most
  - Advanced biofuels – yes, but we should not push this too fast! Low carbon fuel standards can help
  - EVs/FCVs but relatively high cost and massive infrastructure investments and coordination will be needed – need to start now
- Local level – integrated planning / land use/ modal shift policies (but national gov's can encourage)