

Global Mobility Scenarios

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The Future of Transport System
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Global Policy Agenda on Sustainable Transport Development Has Shifted to Climate Abatement

- Economic & equity aspects, alongside the environmental (air pollution, congestion, etc)
 - Promoted by international organizations, development banks
- Paris Agreement @ UNFCCC COP21 sets up a new climate policy regime for transport
 - Based on nationally determined contributions (NDC) of parties
 - Parties' individual & joint assessment of individual & collective progress is critical



Anticipating Future Scenarios....

Global trends



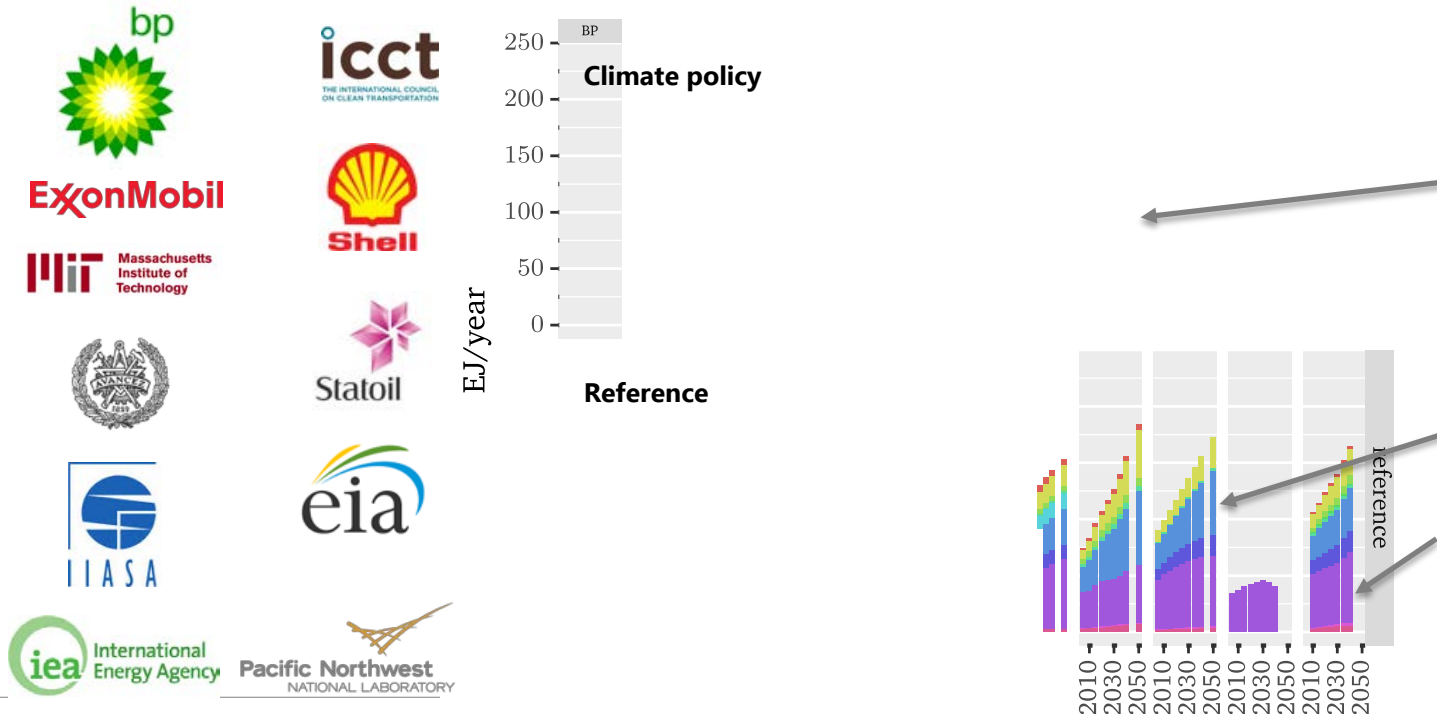
Policy & tech change



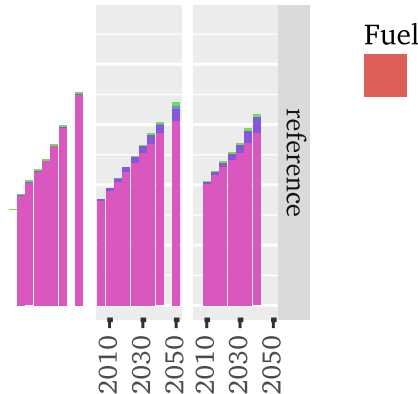
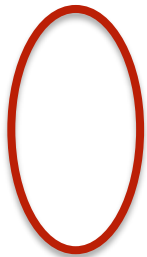
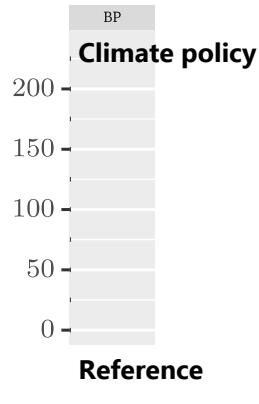
Markets and geopolitics



Transport energy by mode: LDV & HDV still dominate, aviation & freight are the fastest growing modes

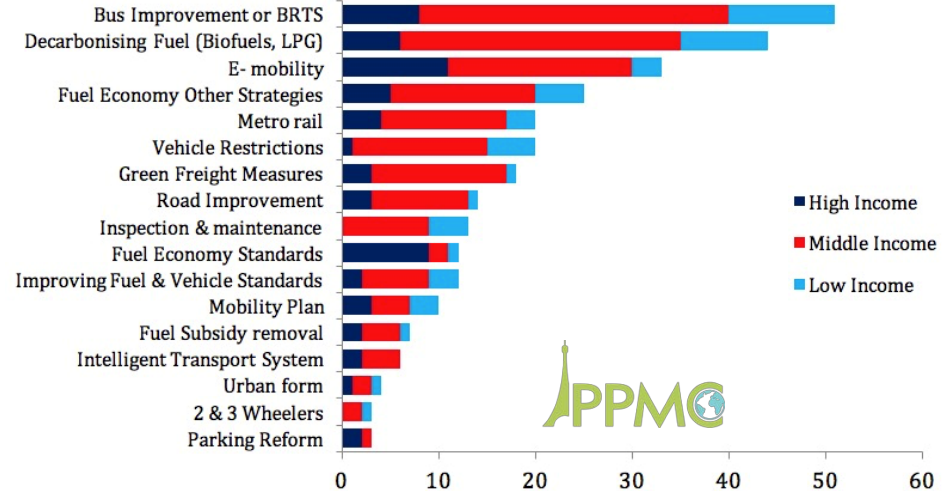
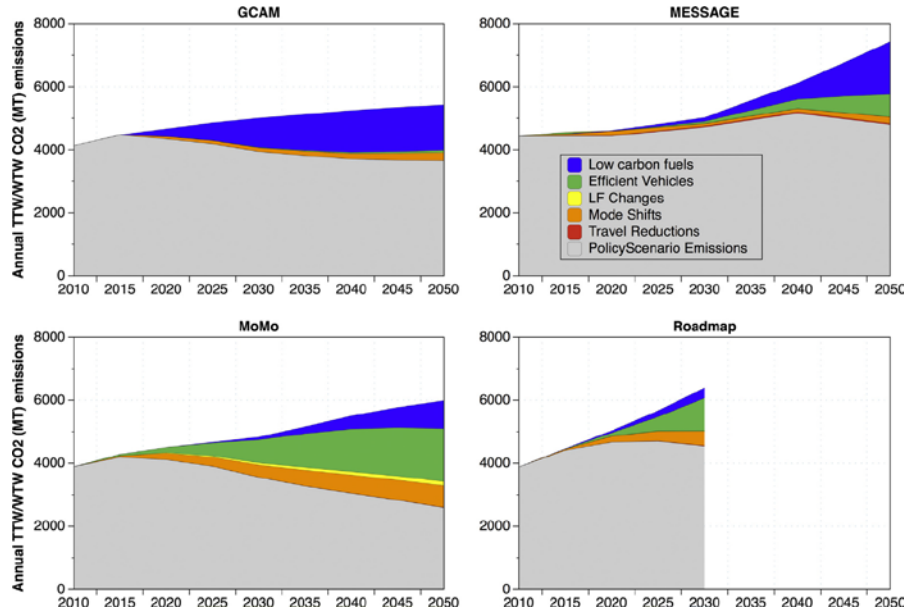


Global: Fossil liquids still the dominant fuel even in 2° scenarios



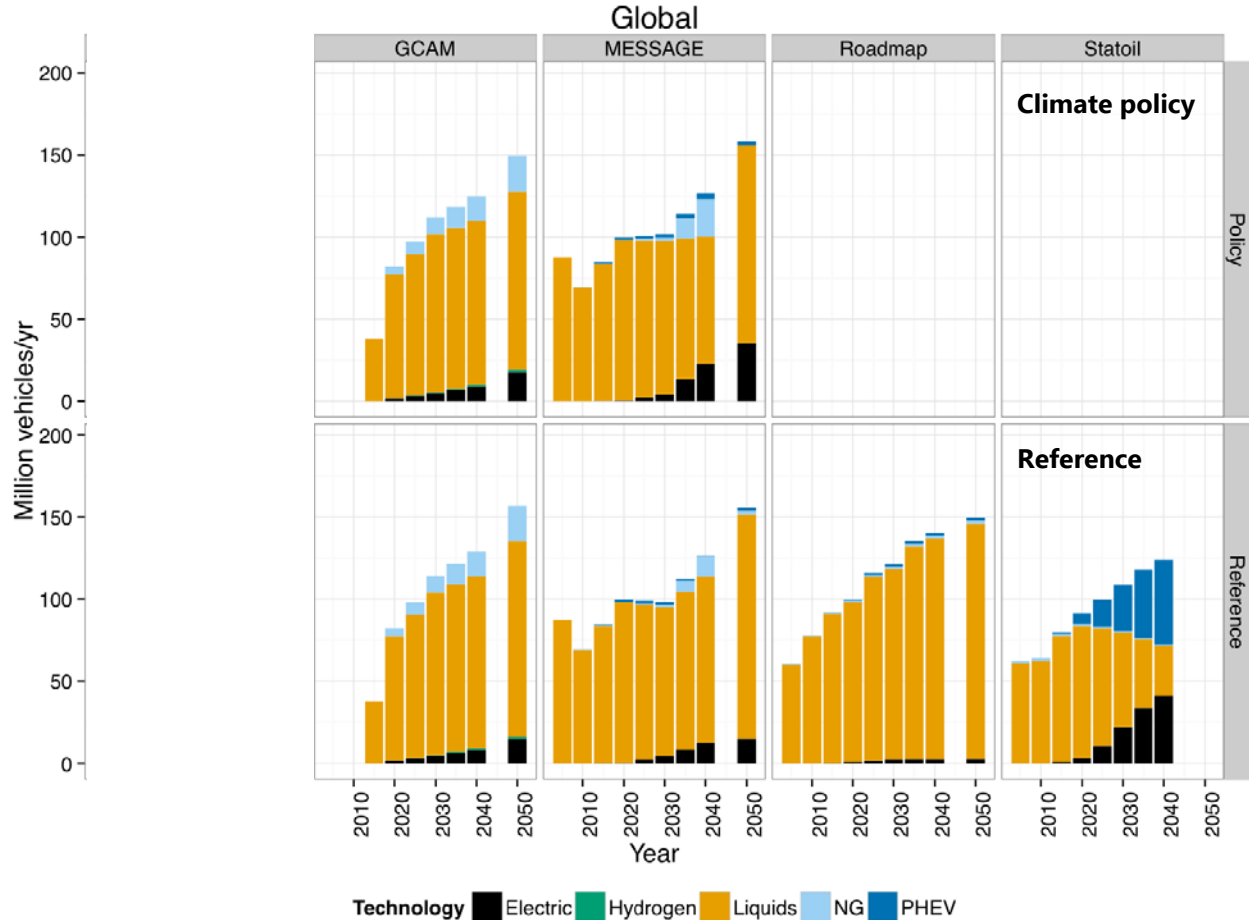
- Some show only small energy reductions relative to baseline
- Overall greater share of alt. fuel use
- Liquids (including biomass liquids) still dominate in the policy

Global Optimal (?) Pathway to Reach 2° Target



NDCs Sees Potentials for Ambitious Action and Huge Investment Needs in the Transport Sector

- Share of electric (EV + PHEV) will be growing, but how fast and by how much?



Global EV policy targets lacking behind 2° scenario

Table 2. Comparison of announced policy targets with model-projected number of electric vehicles needed to be on the road by 2020/2025 in order for the transportation sector to be consistent with the 2 °C target. Average values across models are shown; full ranges in parentheses.

	China	U.S.	Global
ITEM	28 million (2–47)	29 million (9–42)	113 million (35–180)
Policy/Target	5 million by 2020 ^a	1 million EVs by 2015 ^b 3.3 million by 2025 ^c	20 million by 2020, 100 million in 2030 ^d

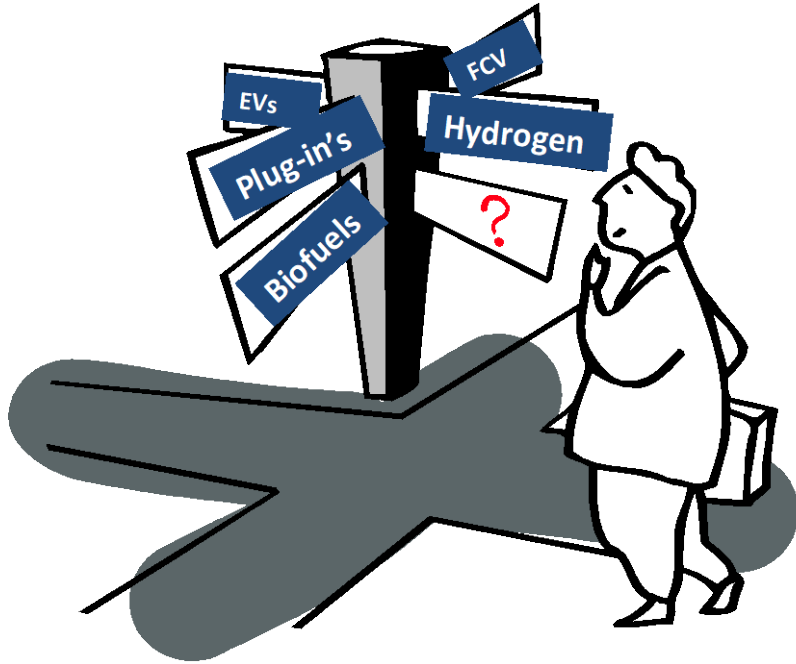
^a Energy Saving and New Energy Auto Industry Development Plan (2012–2020) (State Council, 2012).

^b President's pledge (<https://www.whitehouse.gov/sites/default/files/other/fact-sheet-one-million-advanced-technology-vehicles.pdf>).

^c MOU, 8 states (<http://www.arb.ca.gov/newsrel/newsrelease.php?id=620>).

^d IEA Electric Vehicles Initiative (EVI) (<http://www.iea.org/topics/transport/subtopics/electricvehiclesinitiative/>).

Major Uncertainty: Consumer Choices



- Vehicle cost
- Fuel cost
- Refueling station availability
- Range Anxiety cost
- Model availability
- New technology risk premium
- Towing capability
- Supply chain logistics
- Willingness to pay

Major Uncertainty: Three Transitions

1. Policy driven transition: Electric vehicles

- Emissions, efficiency benefits
- Range, cost concerns

2. Industry driven transition: Autonomous vehicles

- Safety, traffic benefits
- Lowering Value of Time could have unknown impact on total distance traveled

3. Consumer driven transition: Mobility as a service (MaaS)

- Ride-sharing
- Fleet owned, away from personal ownership
- Fewer vehicles on the road, but faster technology turnover

For the first time ever, BP Energy Outlook incorporates 3 mobility revolutions (EVs, shared mobility, autonomy) in their projections

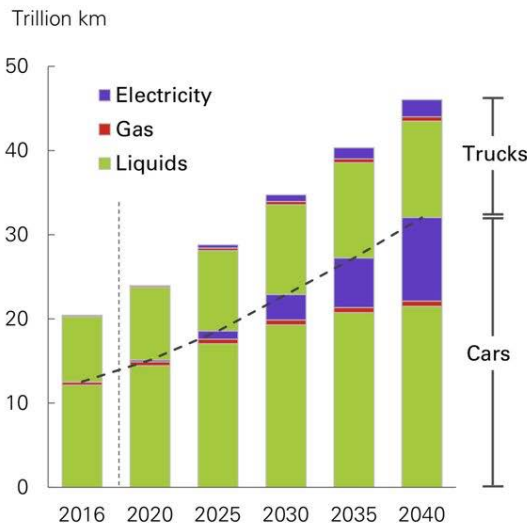
Sectors: Transport

Road transport will be affected by the mobility revolution...



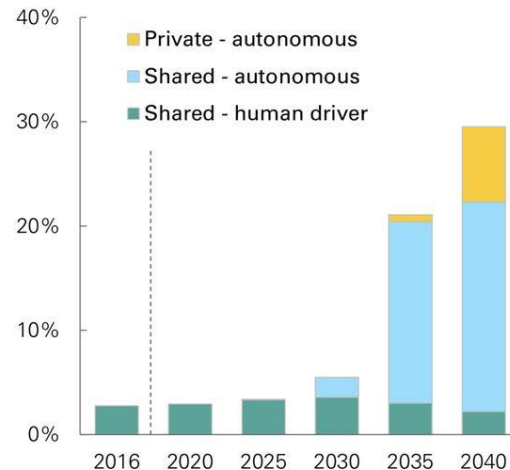
- Predicting large shares of personal Vkm be autonomous and/or shared,
- 30% personal vkm be electrified by 2040

Vehicle kilometres (Vkm) by fuel type



Cars excludes 2- and 3- wheelers

New mobility share of total Vkm



Conclusions

- Transport systems play a critical role in future energy transitions
 - Emerging trends will hinge on the development of technology, policy, resource availability, consumer choice, and geopolitics
 - The future is highly uncertain
- New trends and disruptive innovation bring opportunities and challenges and they need to be better reflected in global models.



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