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IPCC Outreach Event on AR4 Working Group III

Possible CO_2 Reduction in the Transportation Sector Eying 2030 and beyond

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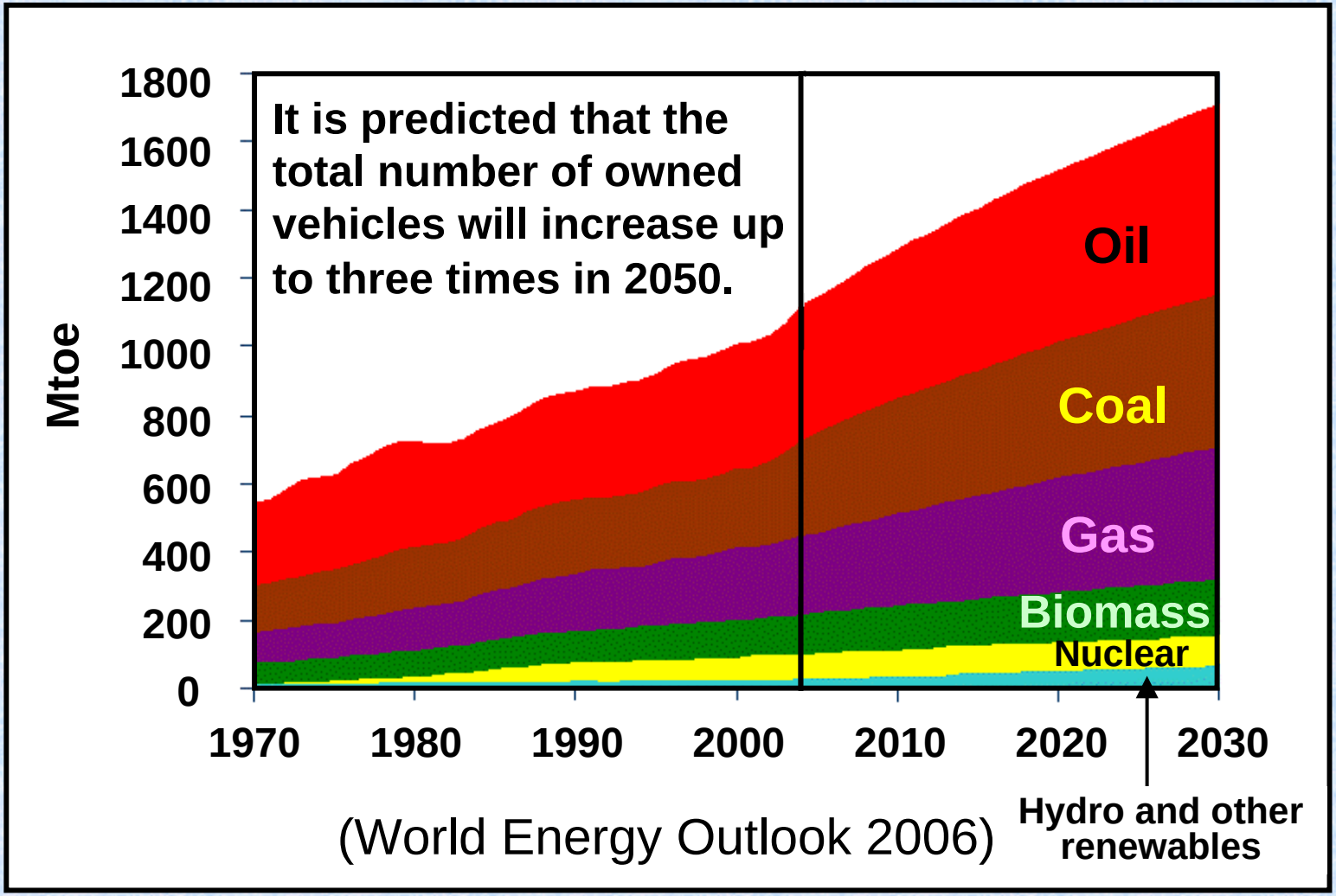
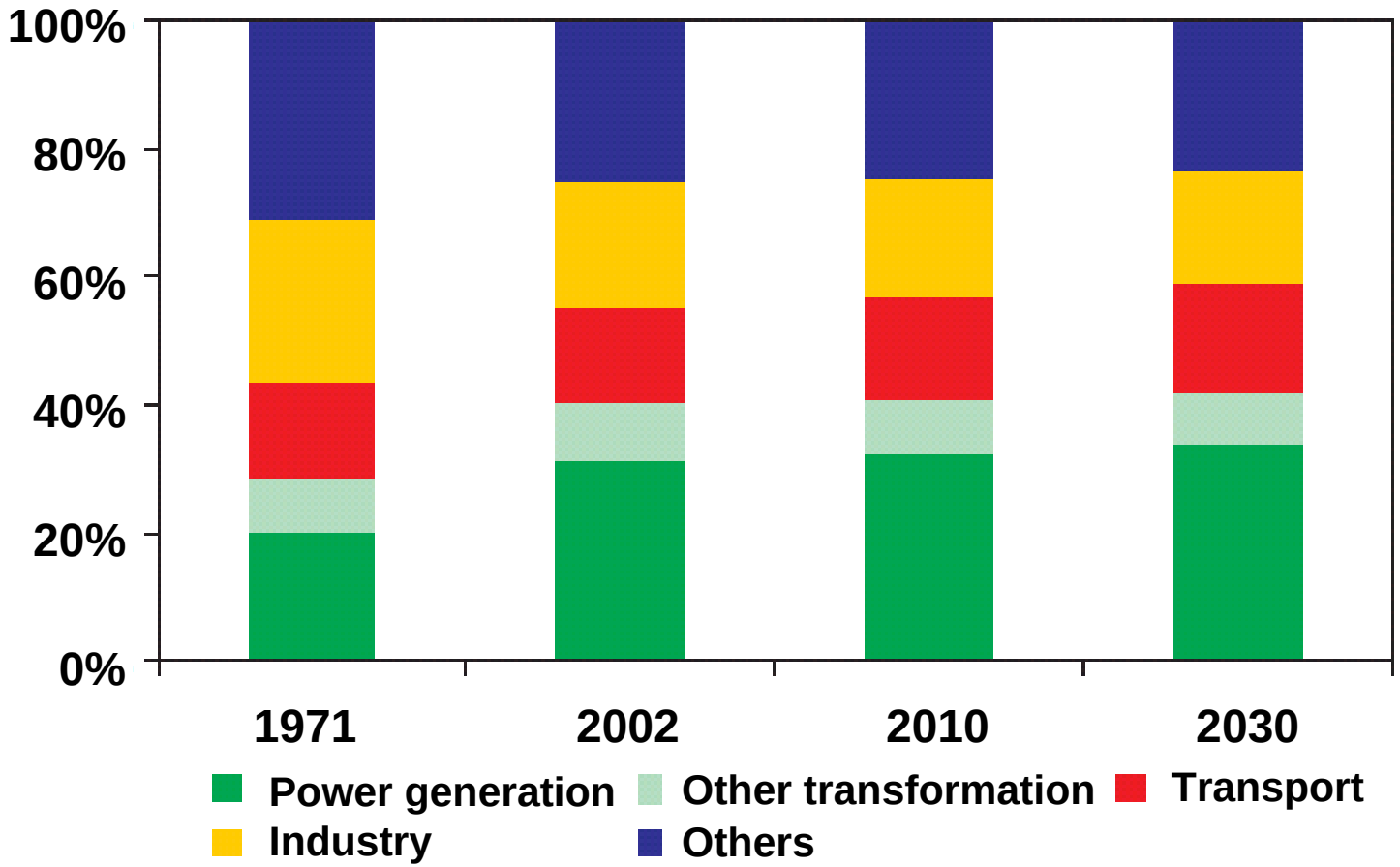


World Primary Energy Demand in the Reference Scenario

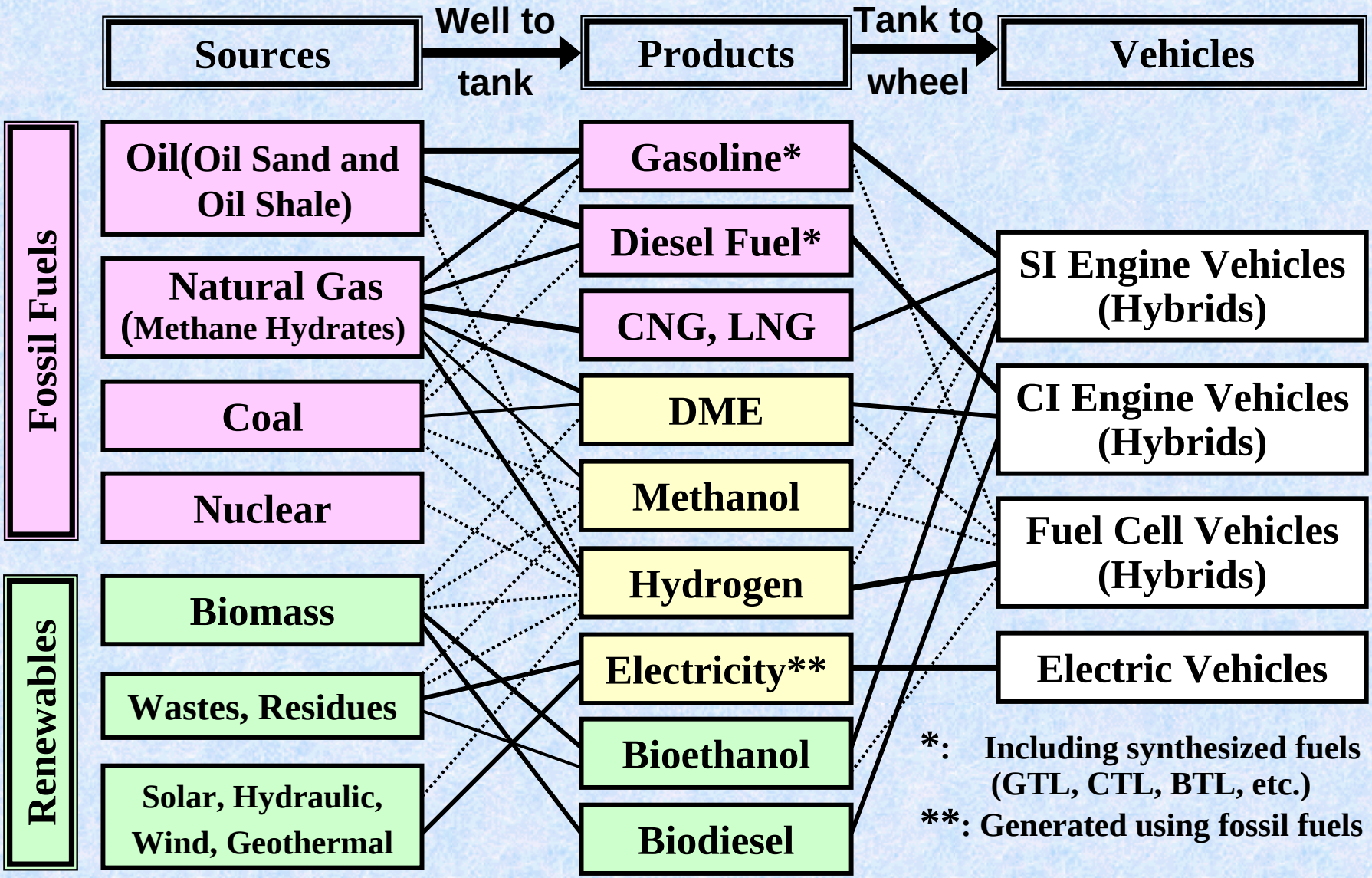
World energy demand in the transport sector will continuously be increasing in the future.



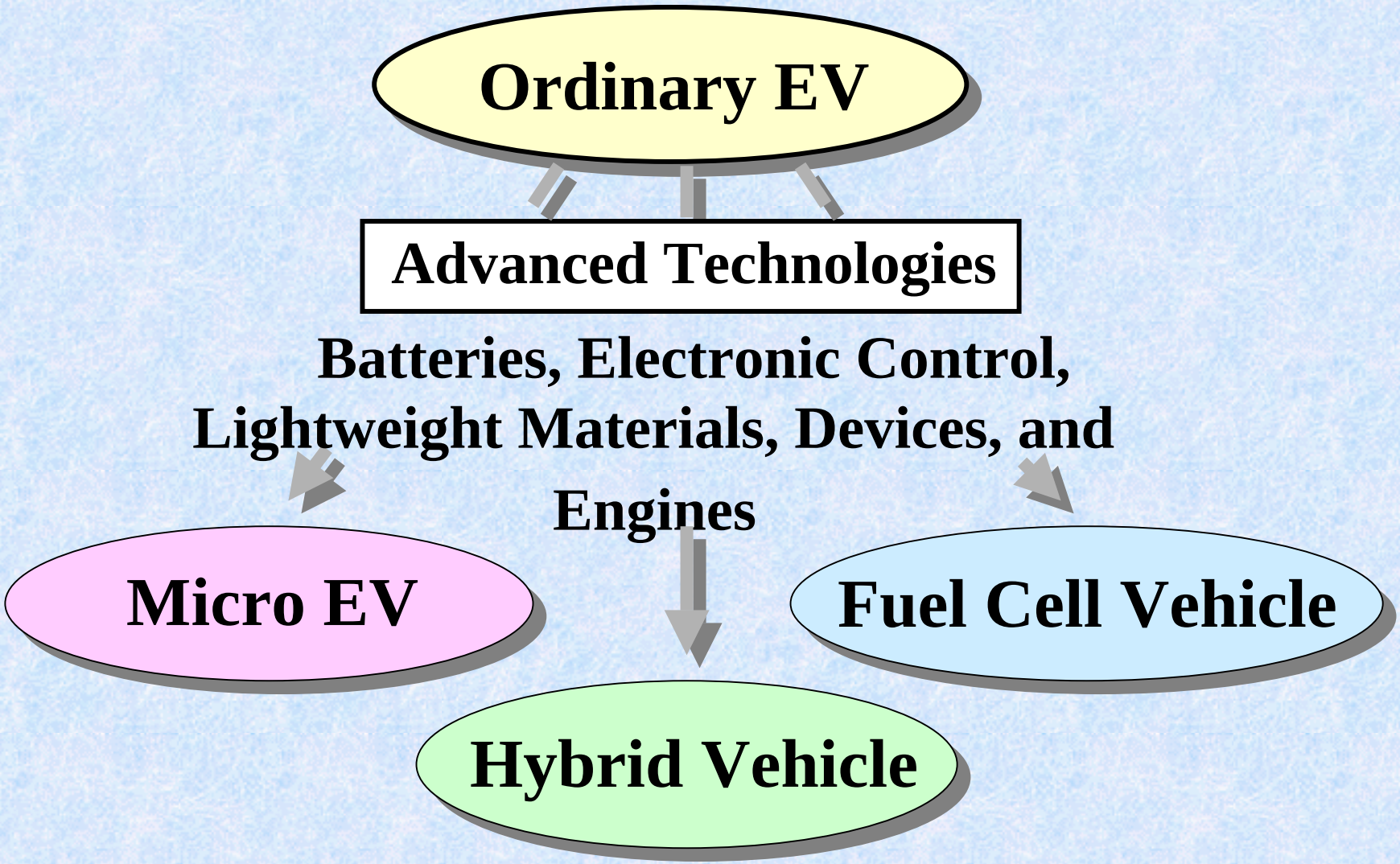
Sectoral Shares in World Primary Energy Demand (World Energy Outlook, 2004)

Three important measures to mitigate vehicle-related environmental and energy issues

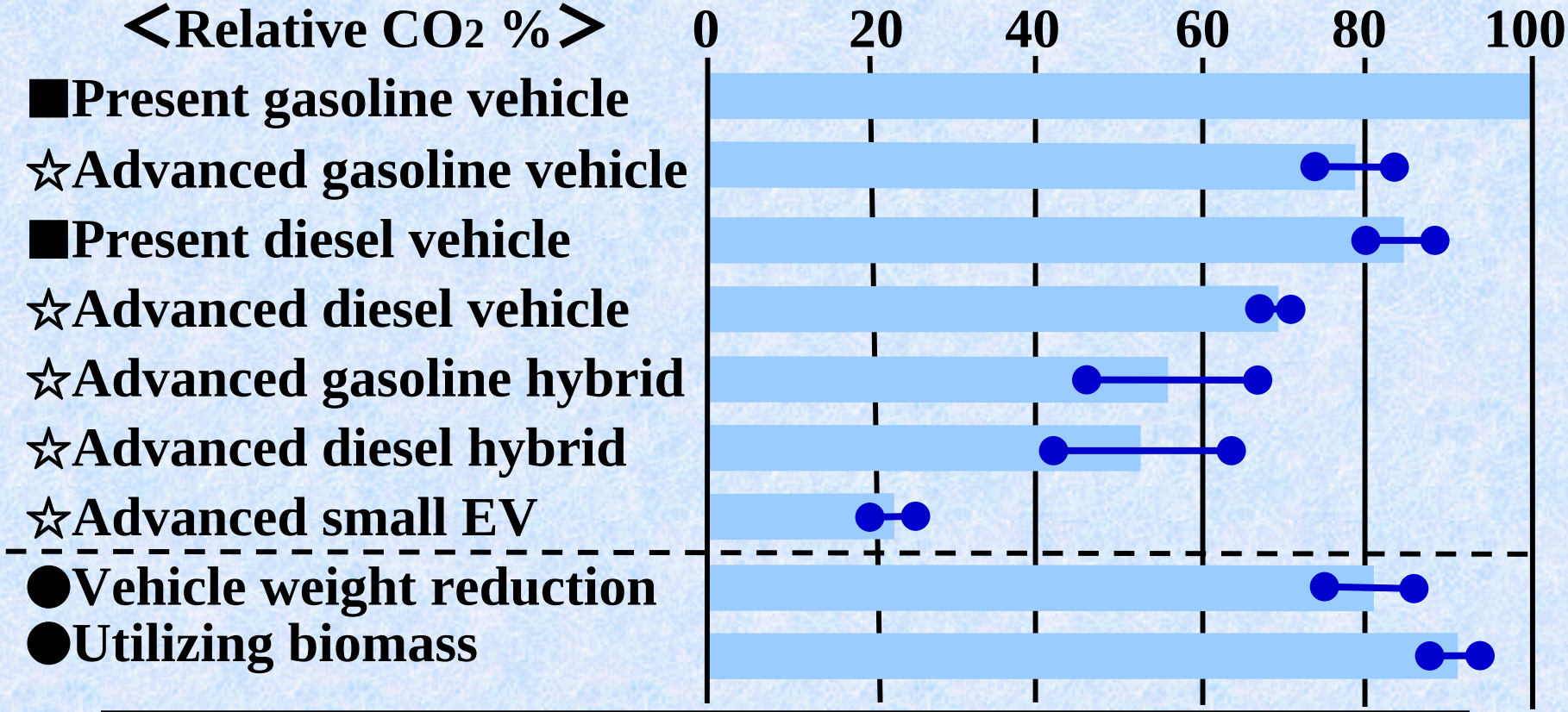
- **Reducing exhaust emissions and improving fuel economy in conventional gasoline and diesel vehicles**
- **Developing and disseminating alternative vehicle power systems and fuels and energy, including hybrids, EV's, FCV's(?), renewable fuels and energy**
- **Changing the way we use the automobile**
  - **Transportation demand management (TDM) (Public transportation, Road pricing)**
  - **Intelligent Transport System (ITS)**
  - **Modal shift to railway transportation**
  - **Ecodriving**
  - **Road planning**
  - **Social and community design (Compact city)**
  - **Tax incentives**
  - **Education, etc.**



Sources and Products for Future Vehicle Fuels



Variations of the Electric Vehicle



<Assumptions>

- Overall efficiency=Fuel conversion η X vehicle η
- Fossil fuels' dependence for power generation: 50%
- Vehicle weight reduction: 20-40%
- Mixing biomass fuels at 6-12% energy equivalence

CO_2 Reduction Technologies for Passenger Cars in 2020-2030 (Baseline: Present gasoline vehicle)

"Initiatives for Next Generation Vehicles and Fuels toward 2030" (METI, May, 2007)

- **Policy targets toward 2030:**
  - **Reducing dependency of vehicle fuels on oil < 80%**
  - **Improving overall energy efficiency > 30%**
- **Five policy and R&D areas to achieve the targets:**
  - ***Electricity and Batteries***
  - ***Hydrogen/Fuel Cells***
  - ***Clean diesel***
  - ***Biofuels***
  - ***Human-Friendly Mobility***
- **Well balanced policies and projects on power systems, fuels and fueling infrastructures will be conducted based on evaluations made every five to ten years toward 2030.**
- **The projects will cover basic studies and rule making based on the cooperation of industry, government and academia.**
- **About 40 billion $ will be provided every year to the above programs in 2007 to 2011**

Changing the Way We Use the Vehicle

■"Intelligent Transport System (ITS)":
- Improving traffic flow
- Minimizing travel time
- Enhancing vehicle safety
- Reducing oil consumption
- Efficient and safe utilization of road infrastructures

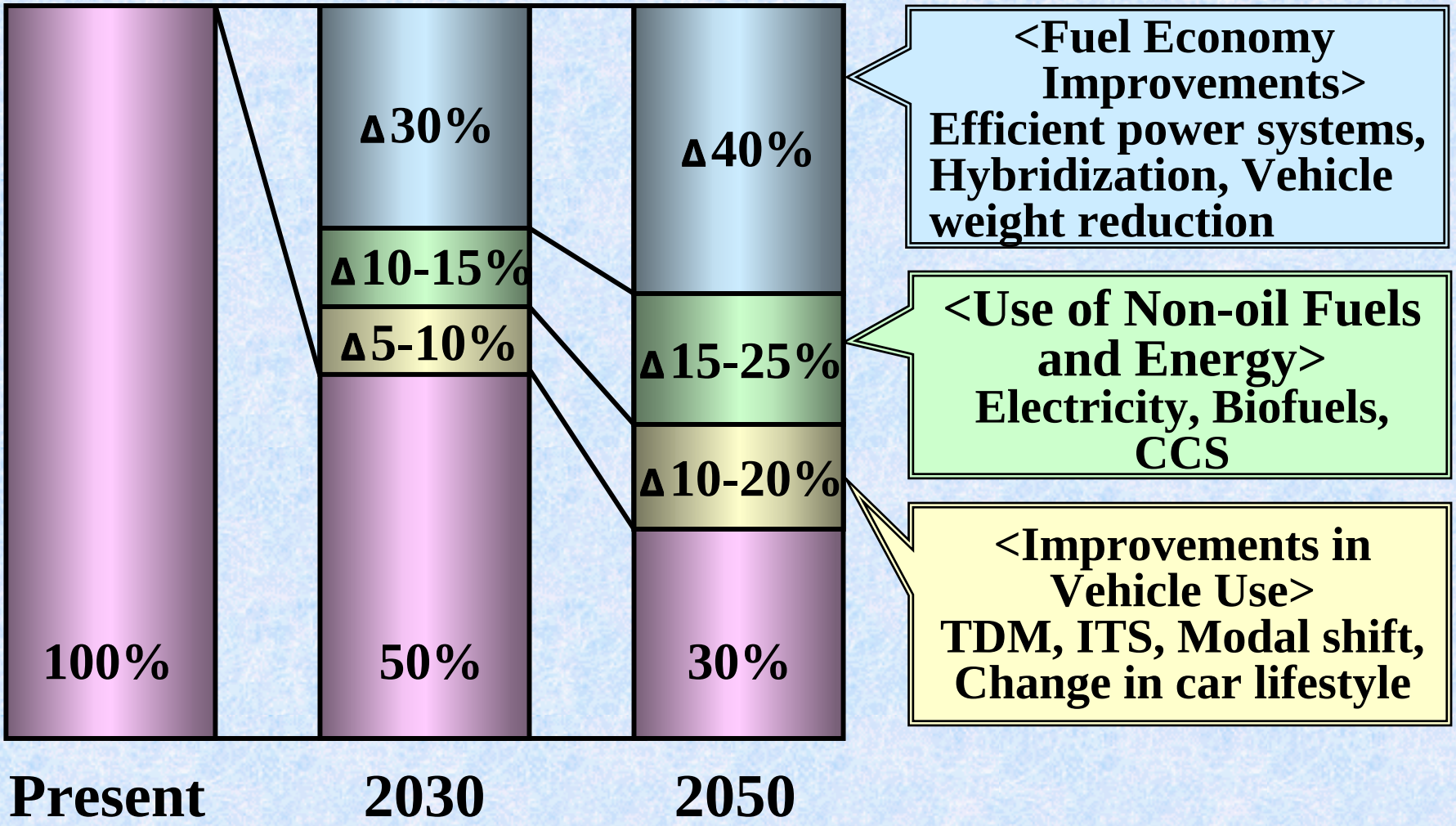
■Changing personal mobility modes (Changing care lifestyle)

■Efficient freight systems using IT ("IT Freight")

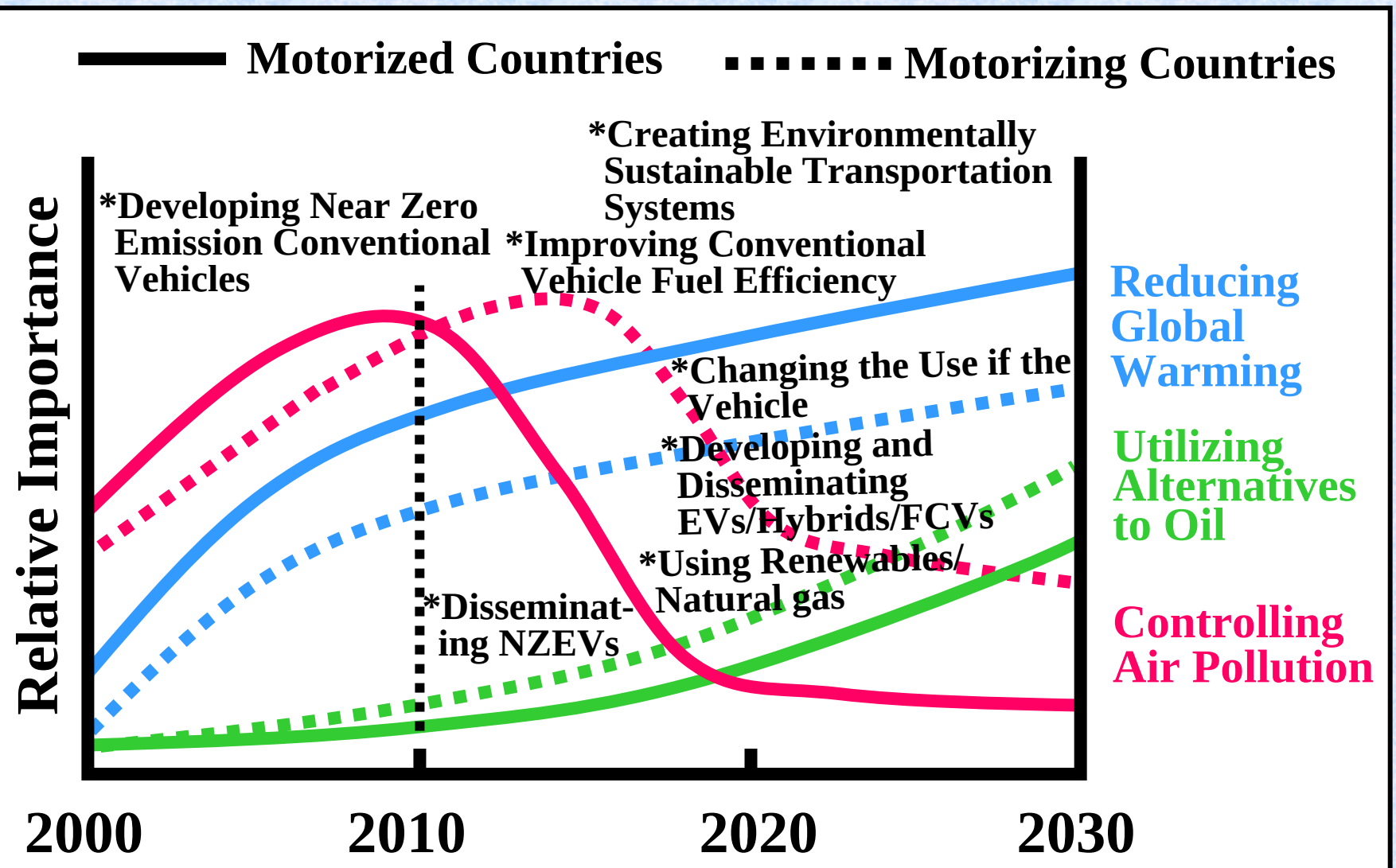
■ "Transportation Demand Management (TDM)" :
- The above three measures included
- Optimizing the entire transportation modes and controlling traffic flows by utilizing public transportation and reducing the use of personal vehicles
- Modal shift from motor vehicles to railways

★Evaluations must be made to identify quantitative effects of these measures on overall CO_2 mitigation.

★Minimizing entire infrastructure costs for transportation is essential by using advanced informatics.



Projected Long-term Reduction in Motor Vehicle CO_2 Emission in Japan (Y.Daisho)



Relative Importance of Policy and R&D for Future Vehicles and Fuels

Policies and R&D Associated with Future Environmentally Friendly Vehicles and Fuels

- **Promoting R&D activities is required to develop, commercialize and disseminate alternative advanced vehicle and fuel technologies.**
- **Specific policy scenarios should be proposed to promote such activities, particularly focusing on mitigating global warming and reducing oil consumption.**
- **"Well-to-Wheel" analyses are necessary to evaluate advanced vehicle and fuel technologies.**
- **Changing the way we use the automobile and developing ITS technologies are necessary. Environmentally friendly, long-term urban transportation planning is essential.**
- **Comprehensive numerical models should be developed to support such scenarios.**
- **Significant contributions should be made to motorizing countries, by supporting them to introduce these vehicle and fuel policies and technologies.**