Global Energy Outlook

October 5, 2010

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Speaker

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Moderator

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Objectives: What you will learn

- Review of Global Energy Issues and Outlook
- Focus on Retail Operations – Likely Near and Longer Term Fuel Trends
- Thinking Outside the Tank
  - New Technologies to Make Conventional Vehicles More Fuel Efficient

Importance of Energy

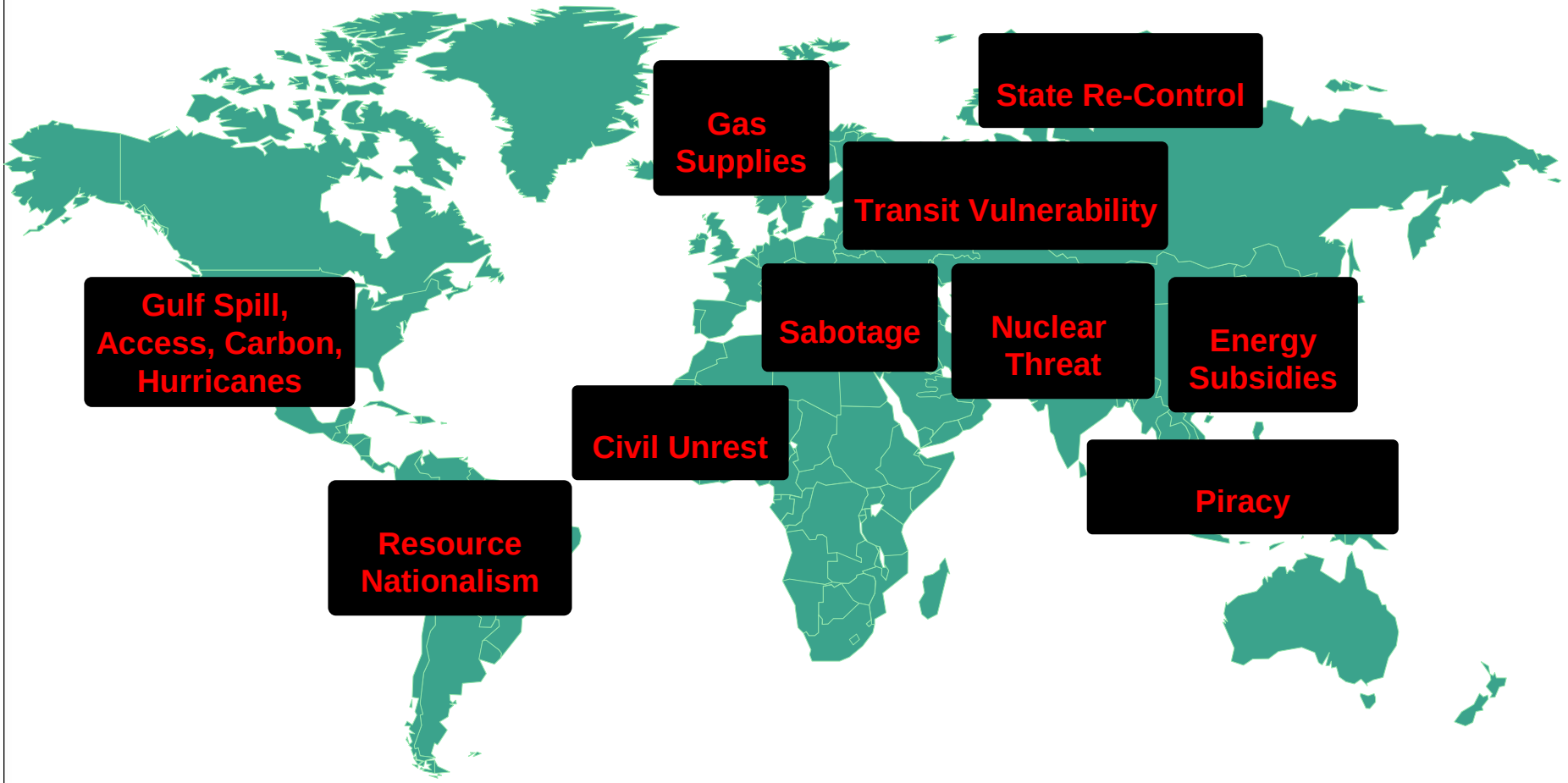
Developing Country Demand

- Energy is vital to society
- Long term economic growth in developing countries will drive fuel demand
- Direct relationship between economic growth and energy demand
  - Example: China's vehicle fleet will be nearly 10 times larger in 2030 than today

Events and Trends

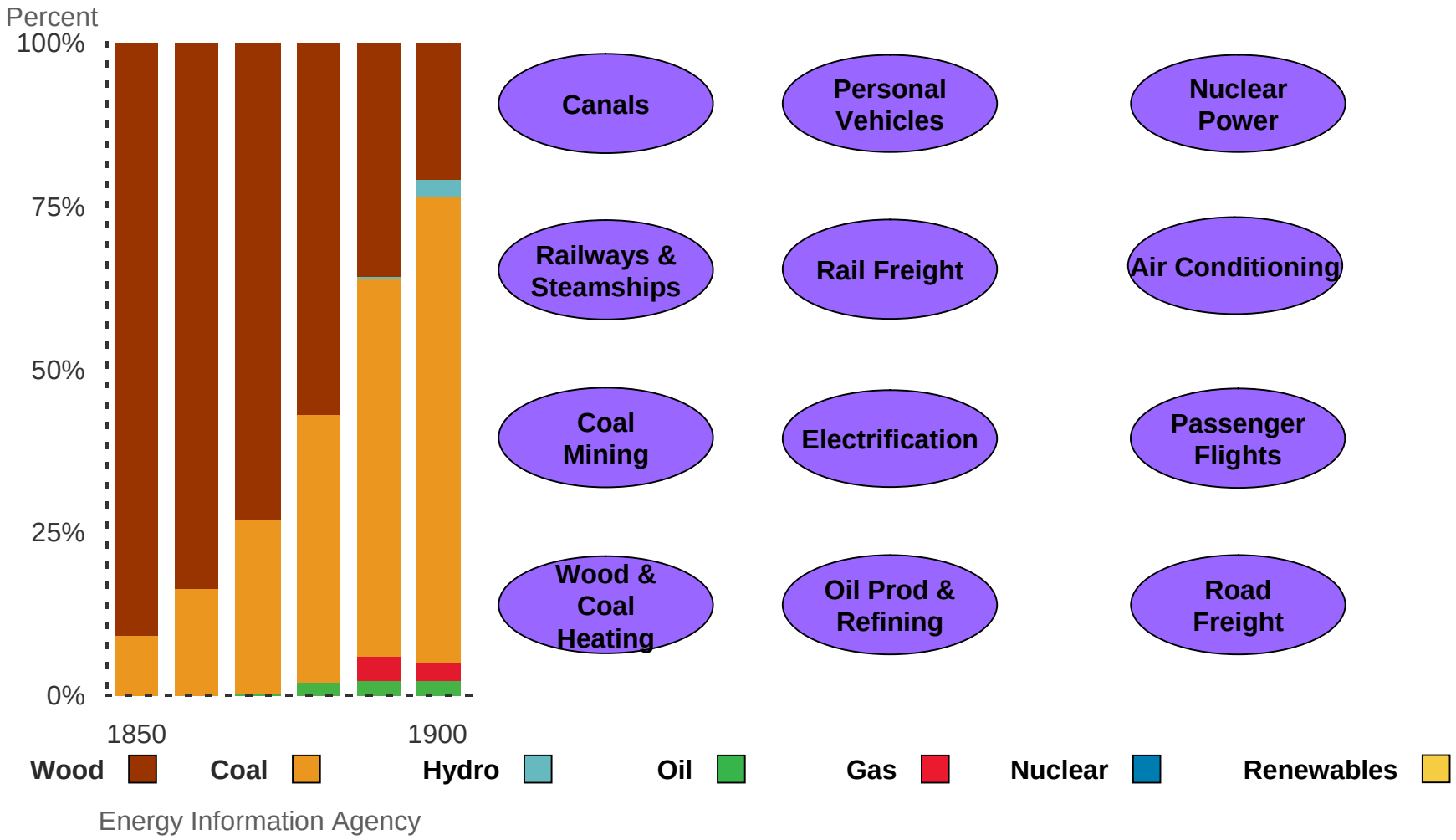
- Energy, access, and climate will continue to be high-profile topics in environmental, economic, energy security and political debate...
  - Focus on Carbon Management – U. S. and Globally
    - U.S. EISA– 2007; EU Renewable Fuels Directive; Japan Biofuels
    - Climate Change Proposals
    - LCFS – U.S. - CA/West; Midwest, Northeast; EU; Canada
    - Regulations
  - Geo / Petro-political issues...
  - Impact of Gulf disaster....access issues and energy security

Heightened and Accumulating Risks



Transition to Modern Energy / Technology

US Energy Demand

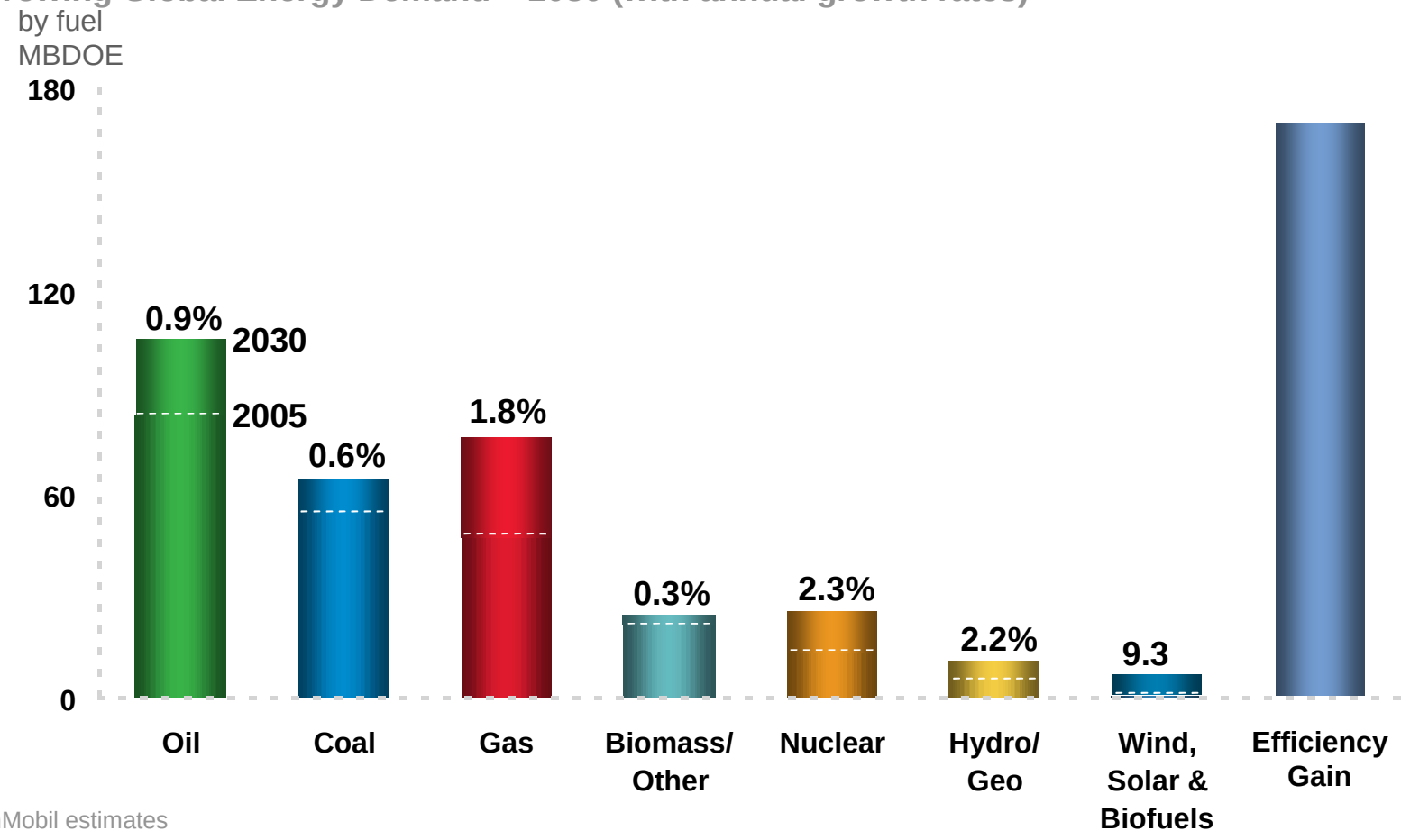


Energy Information Agency

Growing Global Energy Demand by Fuel

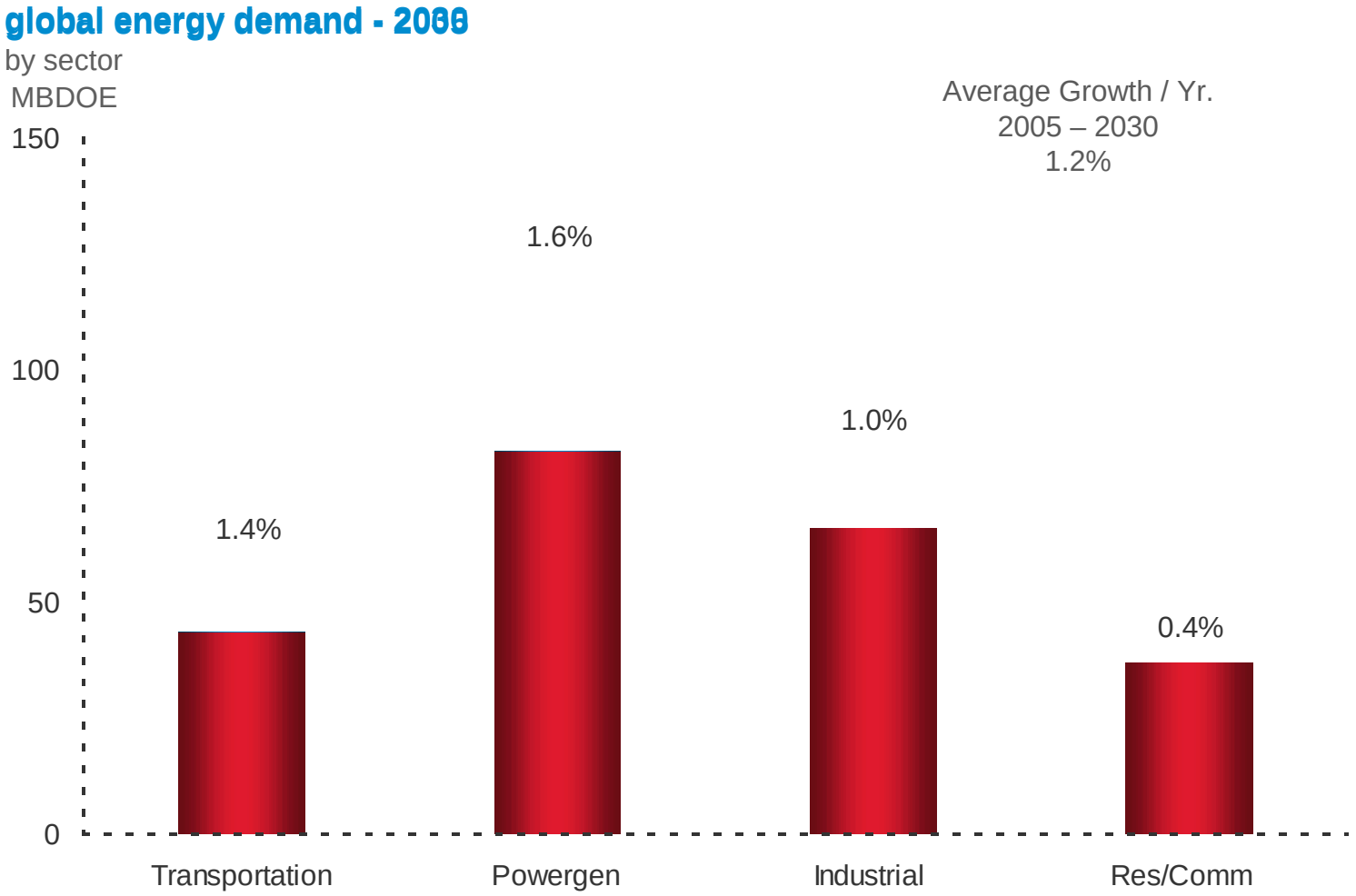
Global Energy Demand - 2005

Growing Global Energy Demand – 2030 (with annual growth rates)



* ExxonMobil estimates

Growing Global Energy Demand by Sector



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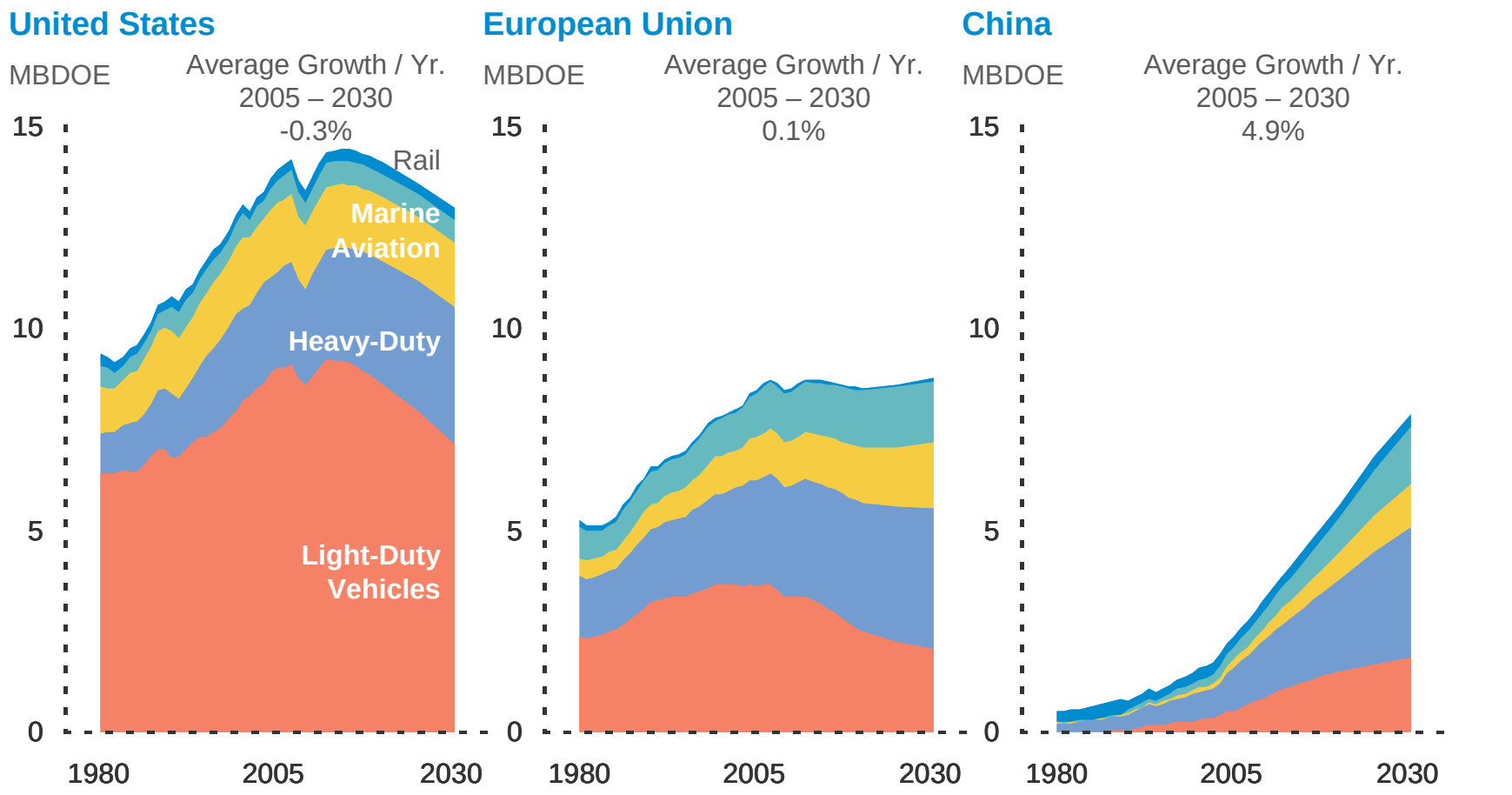
Transportation by Sector



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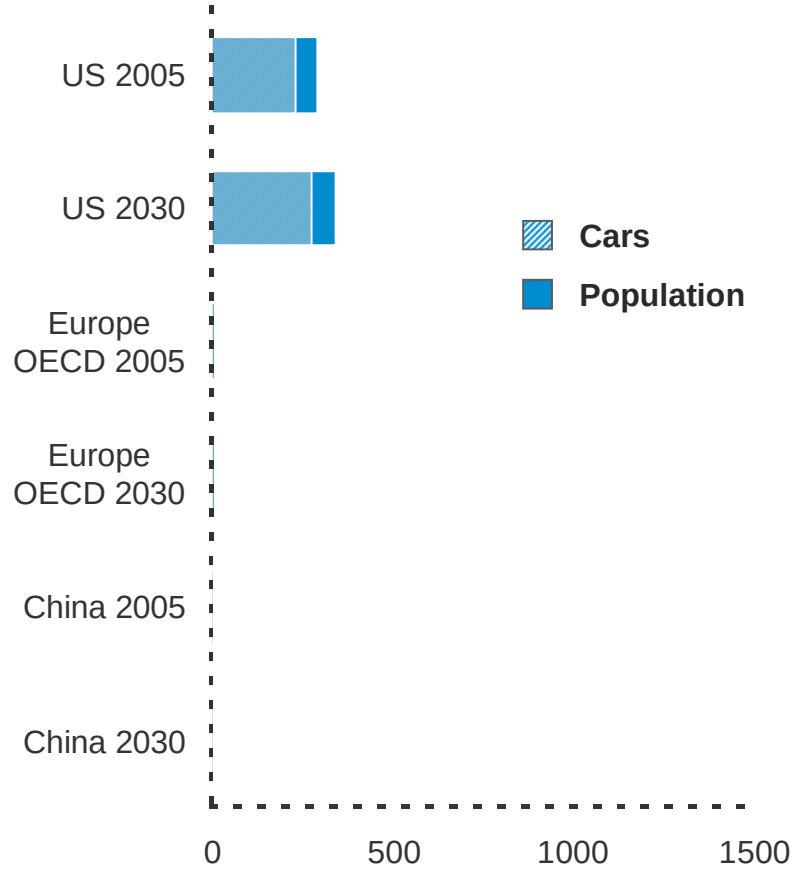
Personal Vehicle Fleet is Growing

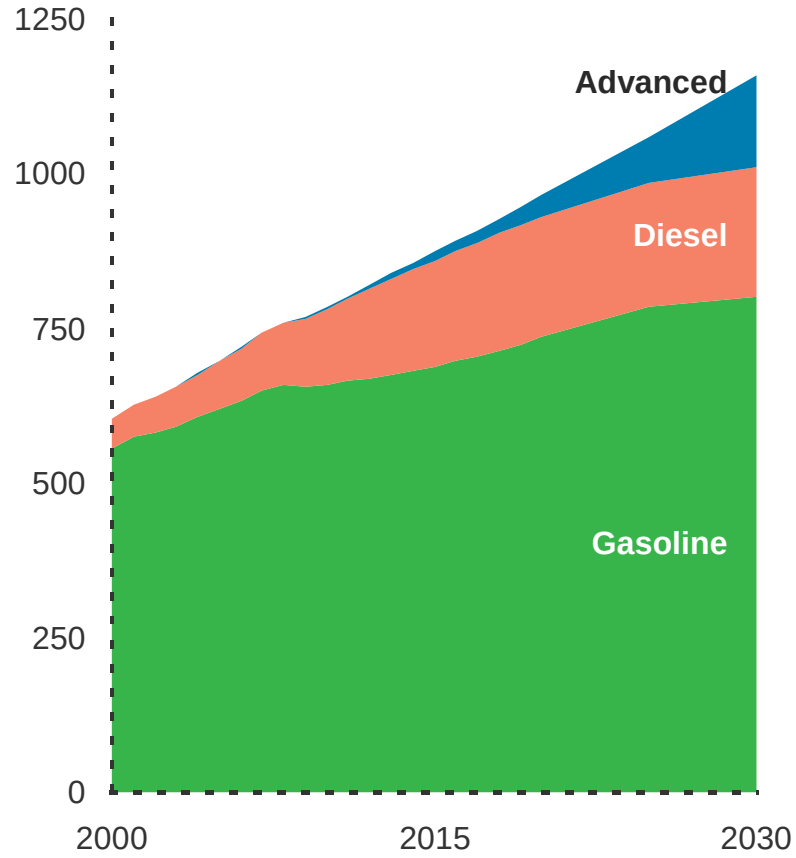
Vehicle Penetration

Cars and Population (millions)

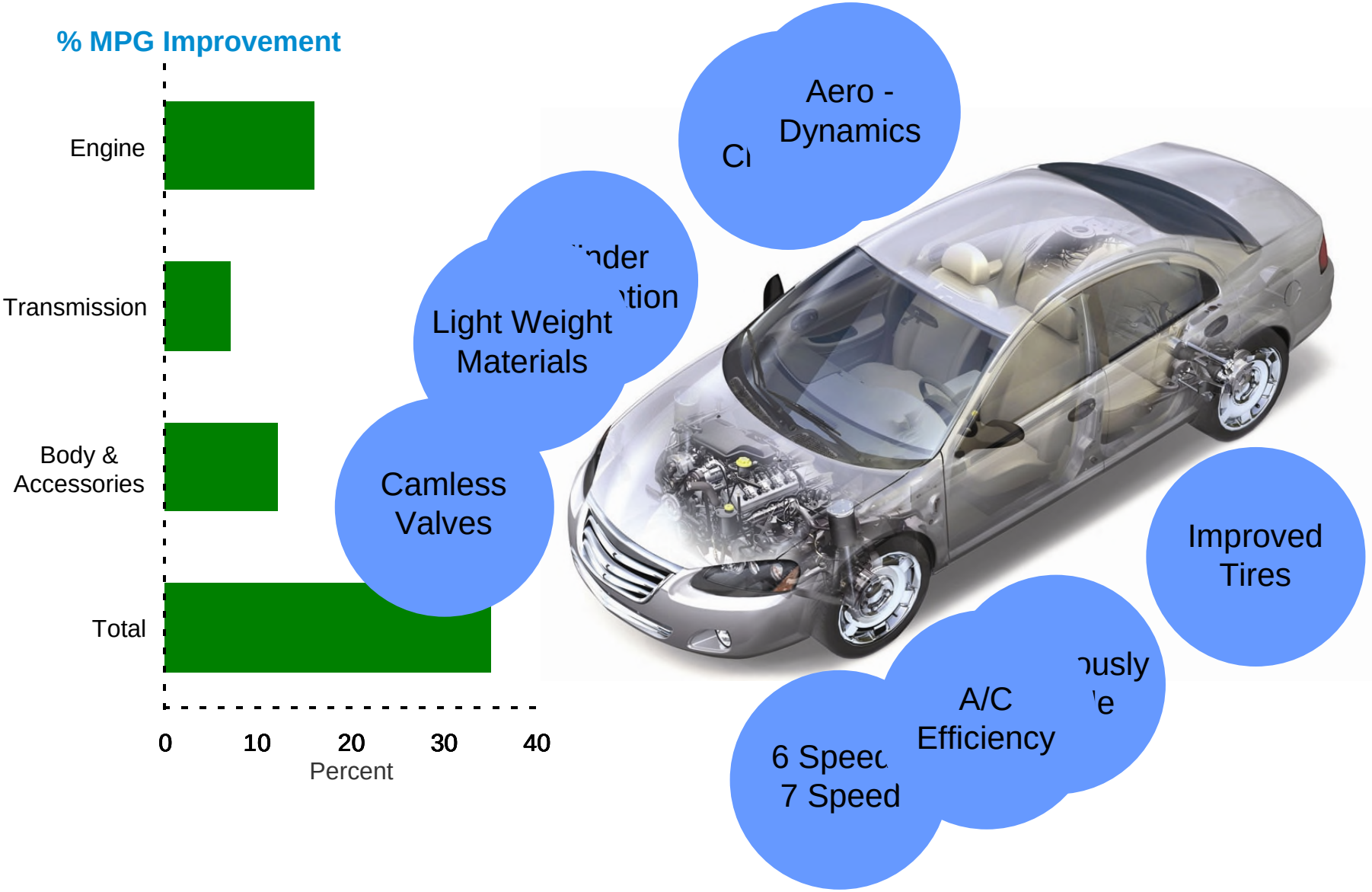


Fleet by Car Type

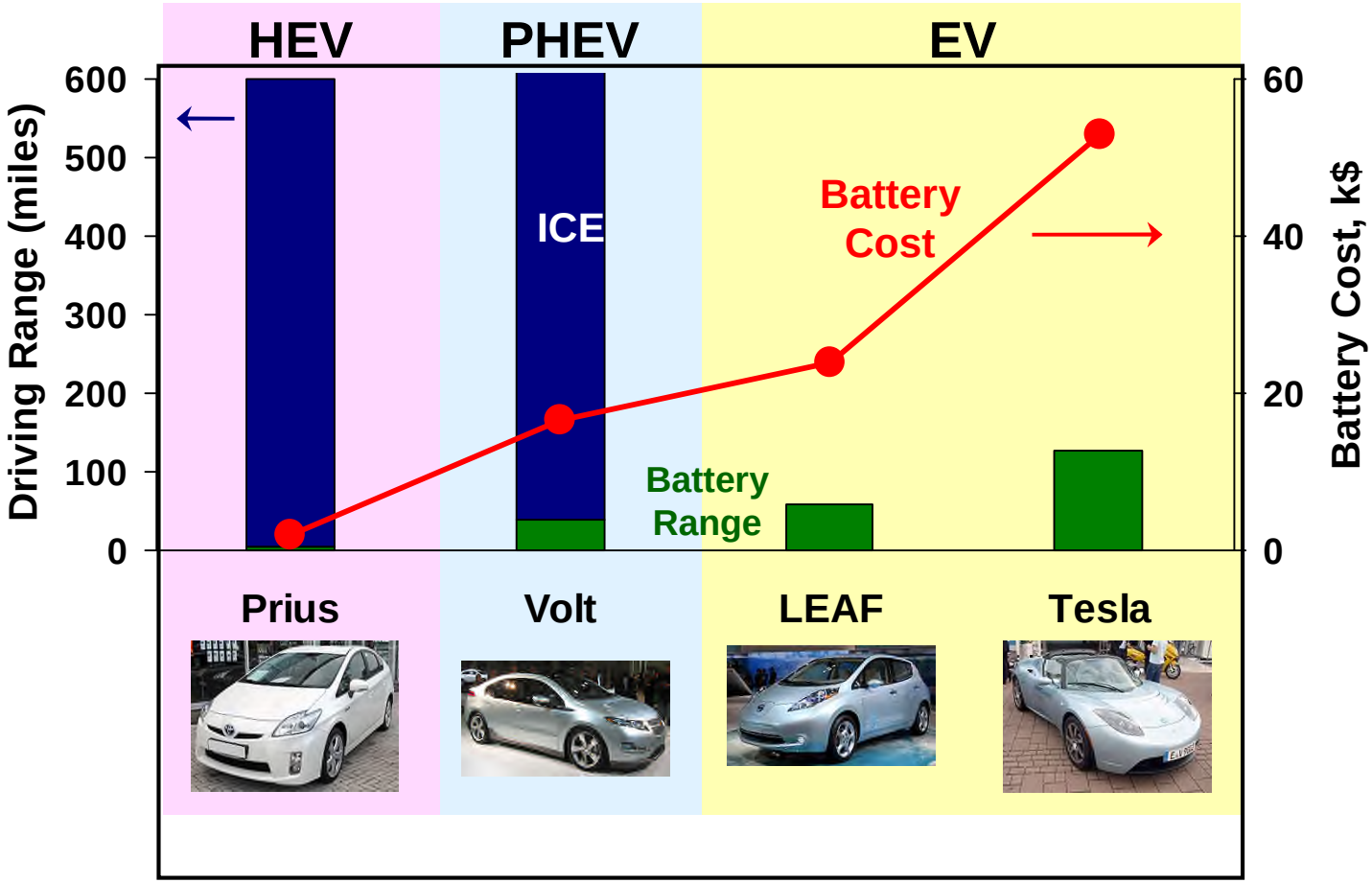
Million Cars



Improving Today's Vehicle



Battery Cost and Driving Range for HEV / PHEV / EV



- PHEV/EV battery costs significant, even with optimistic improvements (e.g., 50% lower cost in 2030): long payback periods for PHEV/EV versus HEV and ICE

ICE = Internal Combustion Engine
Assumptions: 2.4 miles driving range / kWh; $1,000 / kWh battery cost Costs and cost reduction potential from NAS PHEV study (2009, in review)

Algae-based biofuels

- ExxonMobil and Synthetic Genomics will develop innovative solutions to the challenges of large scale production and commercialization of algae-based biofuels by identifying and developing algal strains that achieve high bio-oil yields at lower cost
  - determining the best production systems for growing algal strains
  - developing integrated systems required for full scale, economic production of biofuels
- if successful, algae-based biofuels could help augment the world's transportation fuel supply and assist in reducing greenhouse gas emissions

Retail Ops Issues

How do you plan your investments and configurations for fuels of the future?

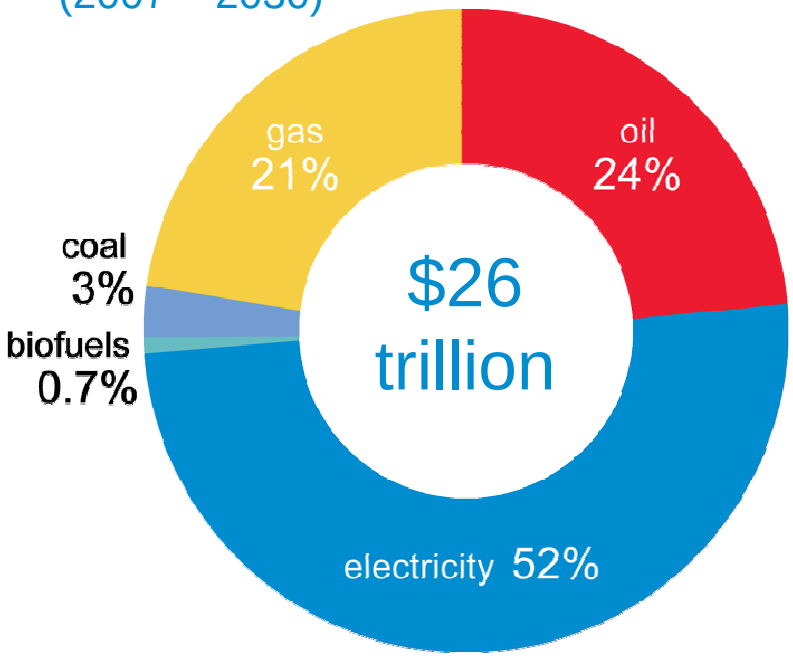
- **Retail Facilities**
  - Infrastructure – hydrocarbon based / gasoline / diesel / ethanol E10 / E85
  - Expansion of ethanol requirements drives infrastructure investments – tanks, lines, dispensers – very expensive for retailers; more flex-fuel vehicles required
- **CNG** – would require both infrastructure and vehicle changes
  - Example: one plan would reduce U. S. oil imports by one-third by using CNG as a transportation fuel
  - Would require $1 trillion in vehicle and site investments (assuming 125 million vehicles and 75,000 fueling sites – reconfigured for NG compression and delivery)
- **Hydrogen**
  - Requires safe handling technology and high production and distribution costs including infrastructure – if overcome could play a growing role in the transportation fuel mix (on-board H2 reformer as the enabler??)
- **Electric vehicles** (EV's) and Plug-in Hybrid Electric Vehicles (PHEV's)
  - Hybrids are very feasible; EV's and PHEV's require step changes in battery technology to support economics and reduce "range anxiety" issues

Some Issues to Consider

- Global demand for fuel and power to grow significantly, requiring increases in efficiency, and expansion of all economic energy sources – energy security
- Increasing risks to the expansion of conventional liquids supplies
- Significant additions of unconventional liquids supply are projected
- Growing pressure on cost and availability of project resources is hindering the ability to expand energy production capability
- Carbon emissions will continue to be addressed – legislation/regulation
- Considerable and sustained investments are required to meet the world's energy needs....

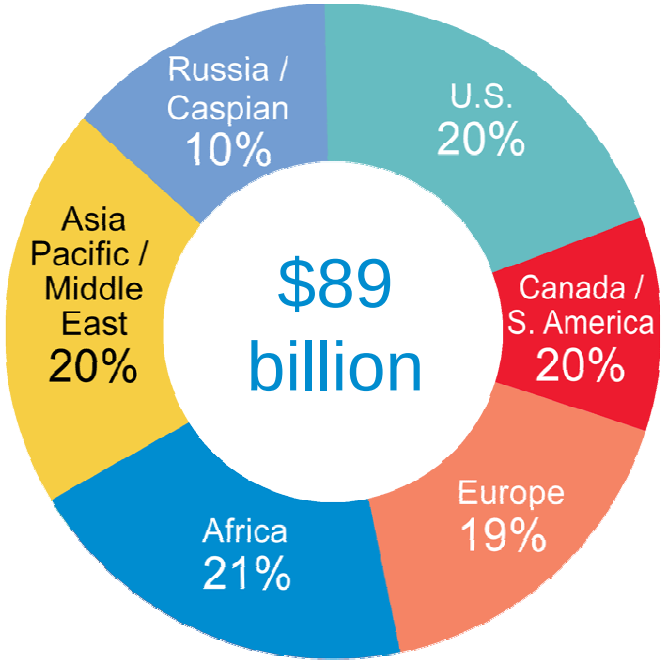
Global Energy Investment Challenge

International Energy Agency: total energy investment required (2007 – 2030)



over $500 billion annually from oil & gas industry

ExxonMobil investments (2005 – 2009)



from 2008 – 2012, we expect to spend over $125 billion

Discussion...
Other issues to Consider...

Questions?

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Thank you!