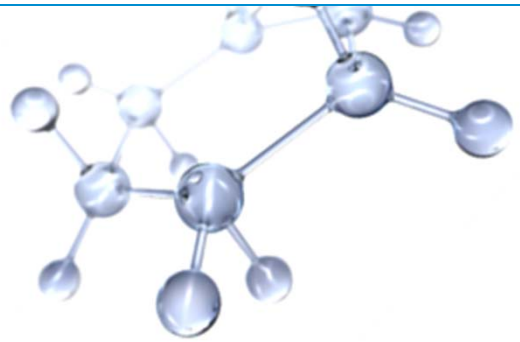
ExxonMobil

Taking on the world's toughest energy challenges.™



The Outlook for Energy

a view to 2030

November 9, 2010

Rob Gardner

Economic and Energy Evolution

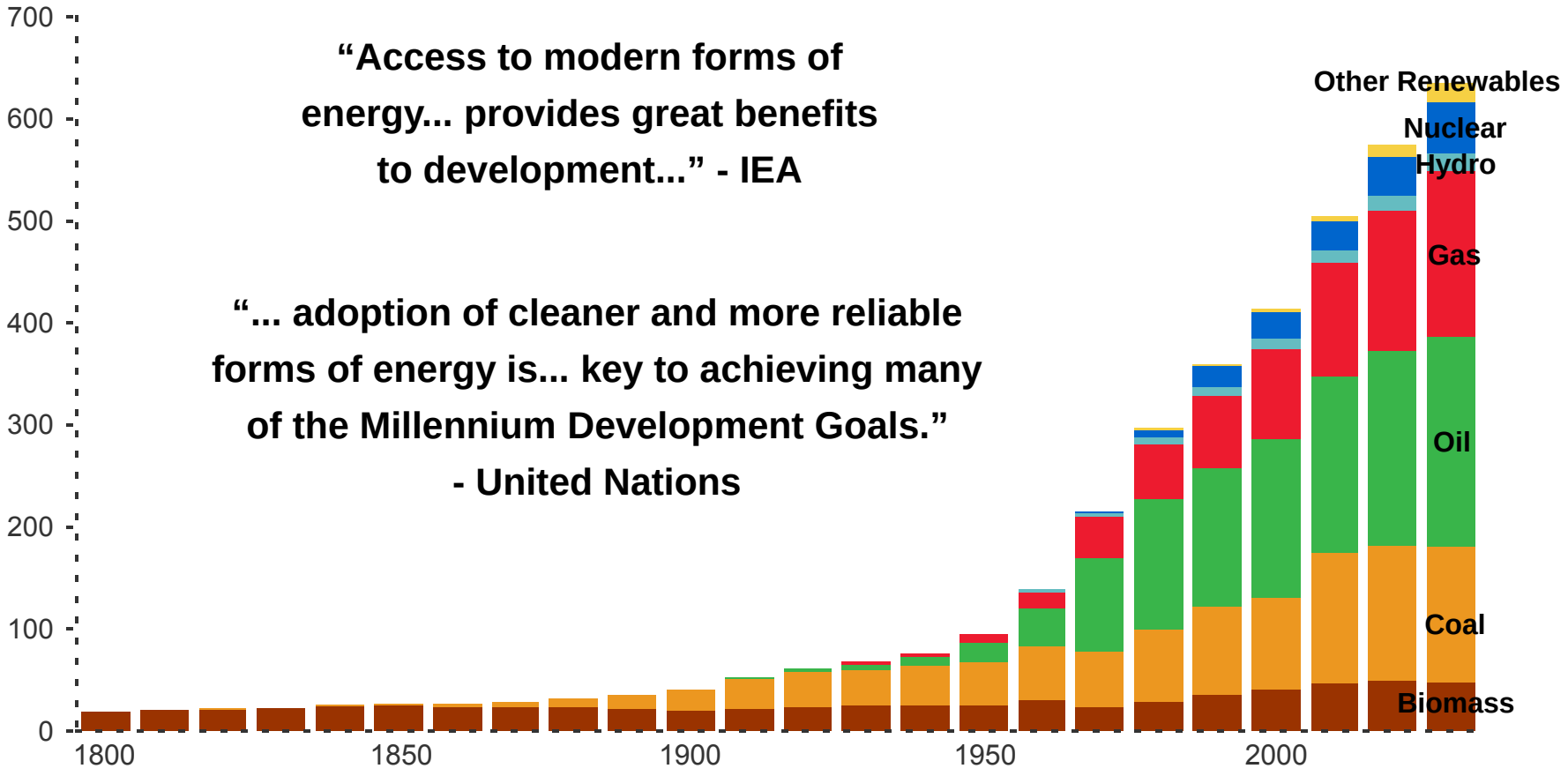
As societies and technologies develop over time…

… energy needs evolve as well

Economic and Energy Evolution

Global Demand By Fuel

Quadrillion BTUs



"Access to modern forms of energy... provides great benefits to development..." - IEA

"... adoption of cleaner and more reliable forms of energy is... key to achieving many of the Millennium Development Goals." - United Nations

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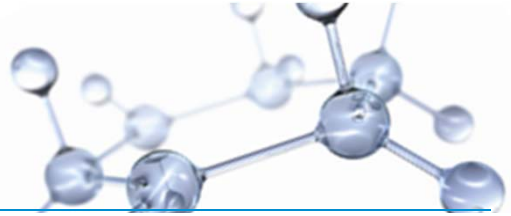
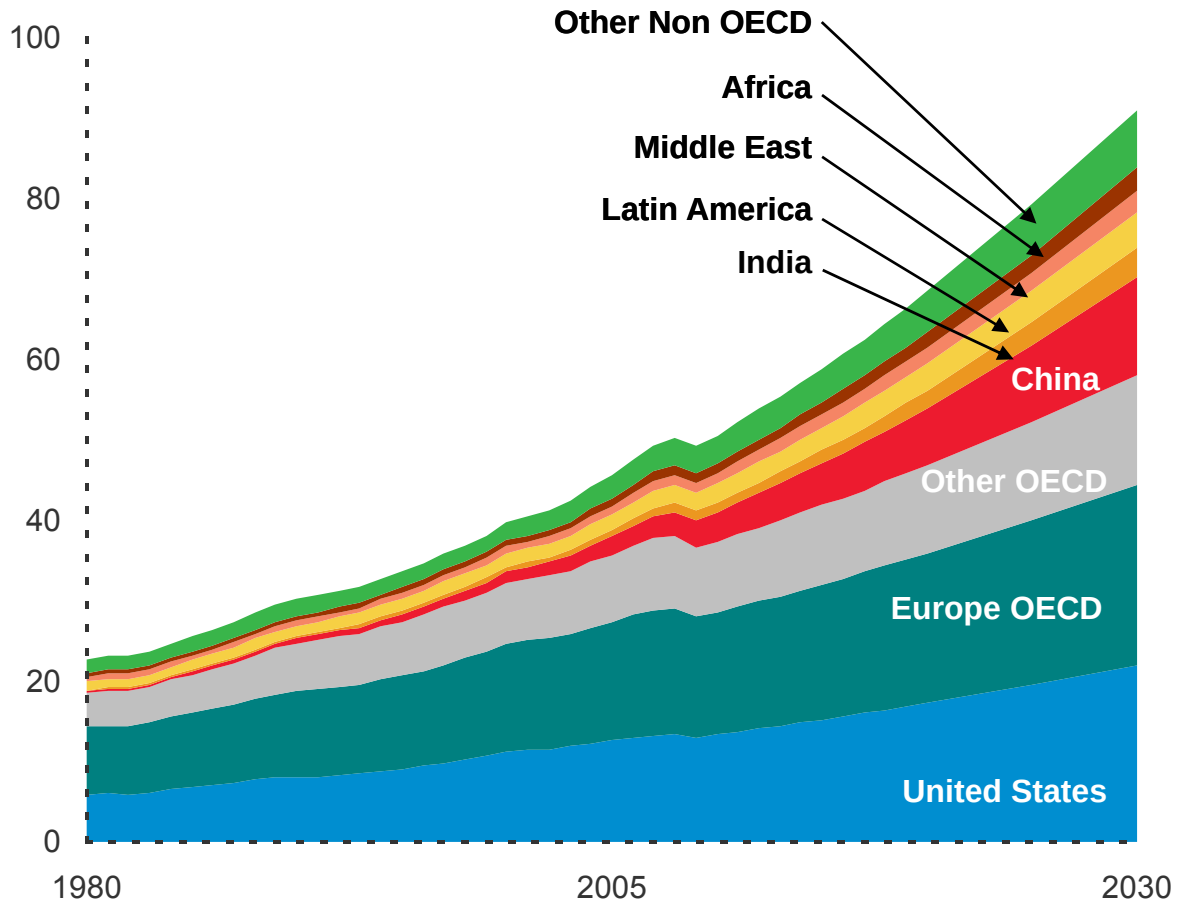
Source: Smil, *Energy Transitions;* ExxonMobil

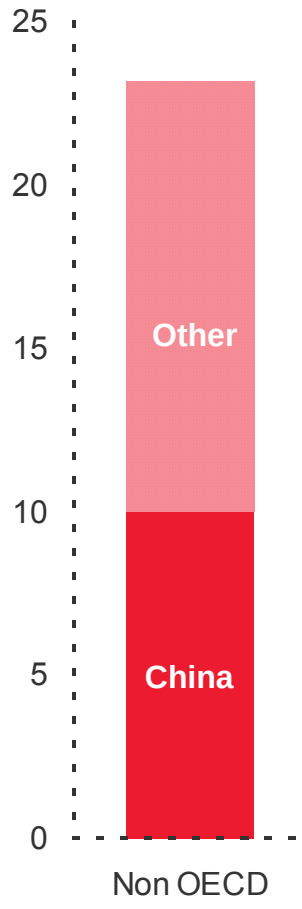
Economic Growth Continues



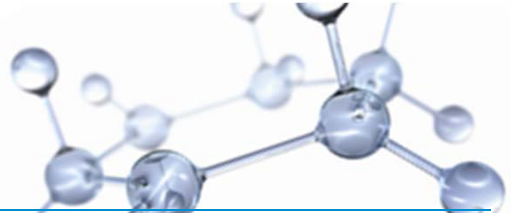
GDP
Trillion 2005$



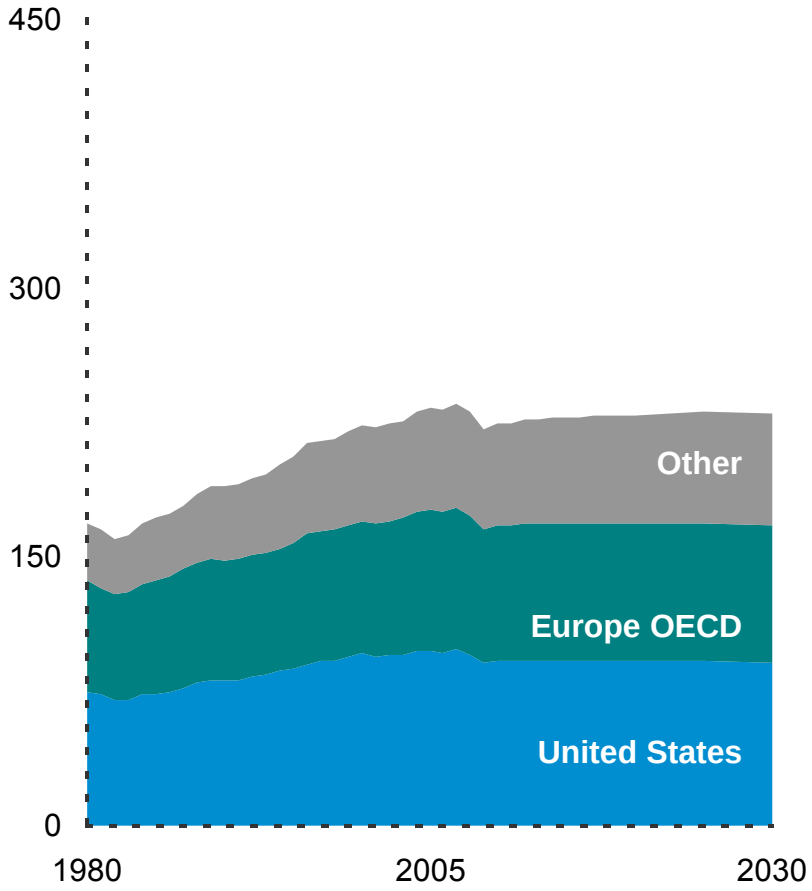
GDP Growth 2005 to 2030
Trillion 2005$



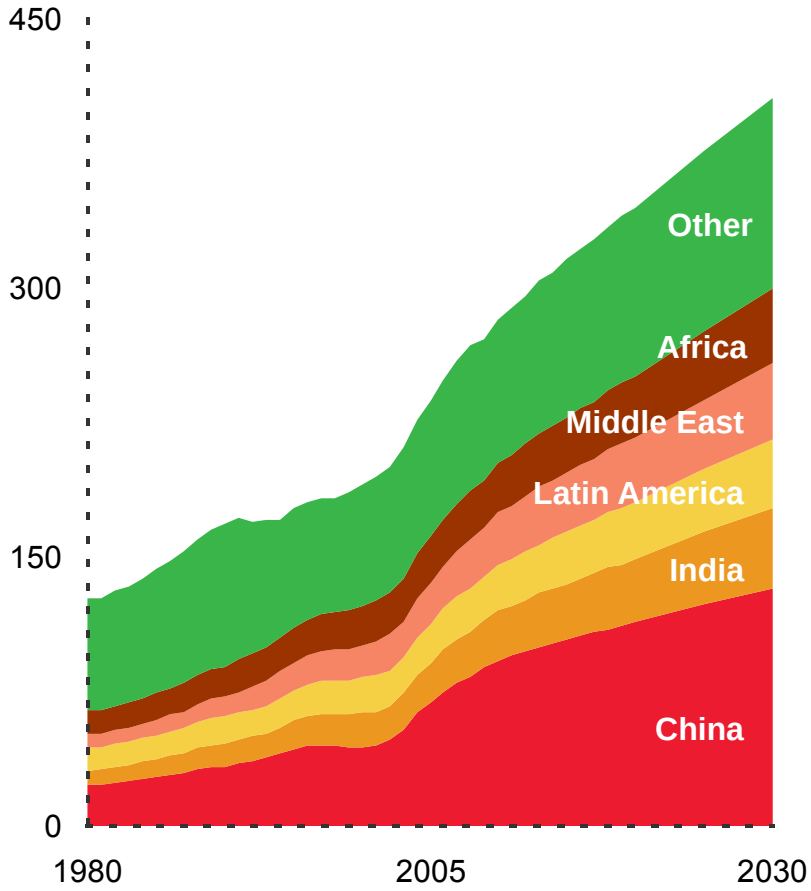
Expansion Economies Drive Demand



OECD
Quadrillion BTUs



Non OECD
Quadrillion BTUs



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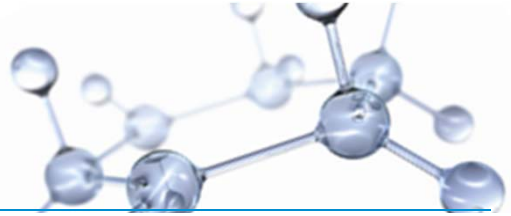
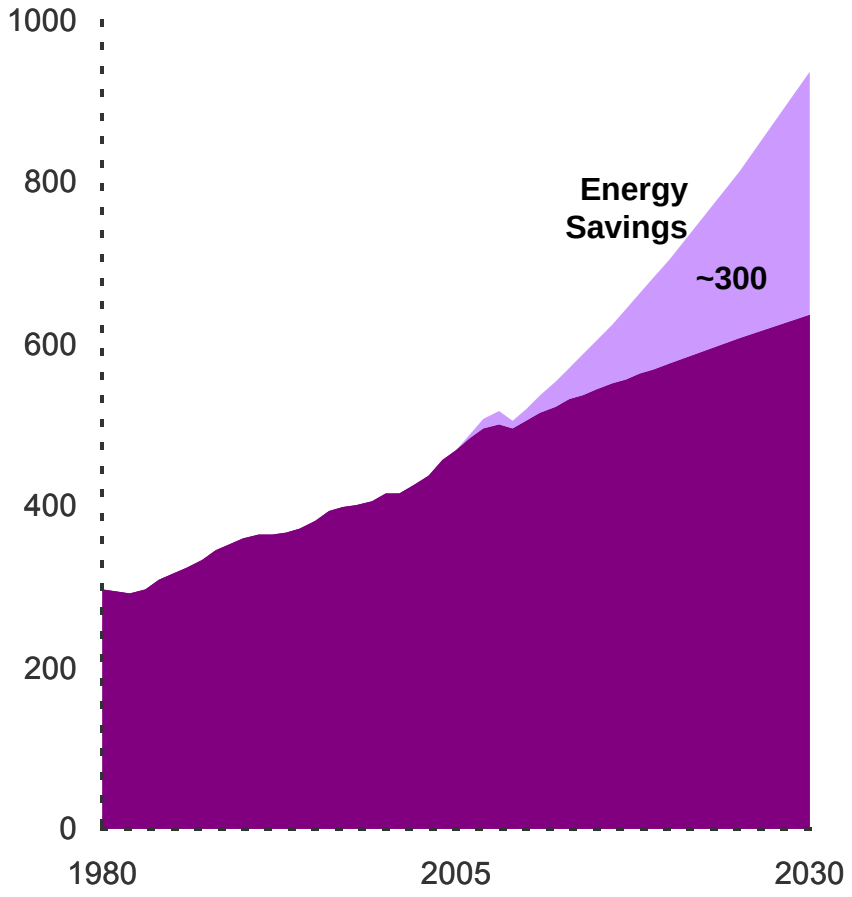
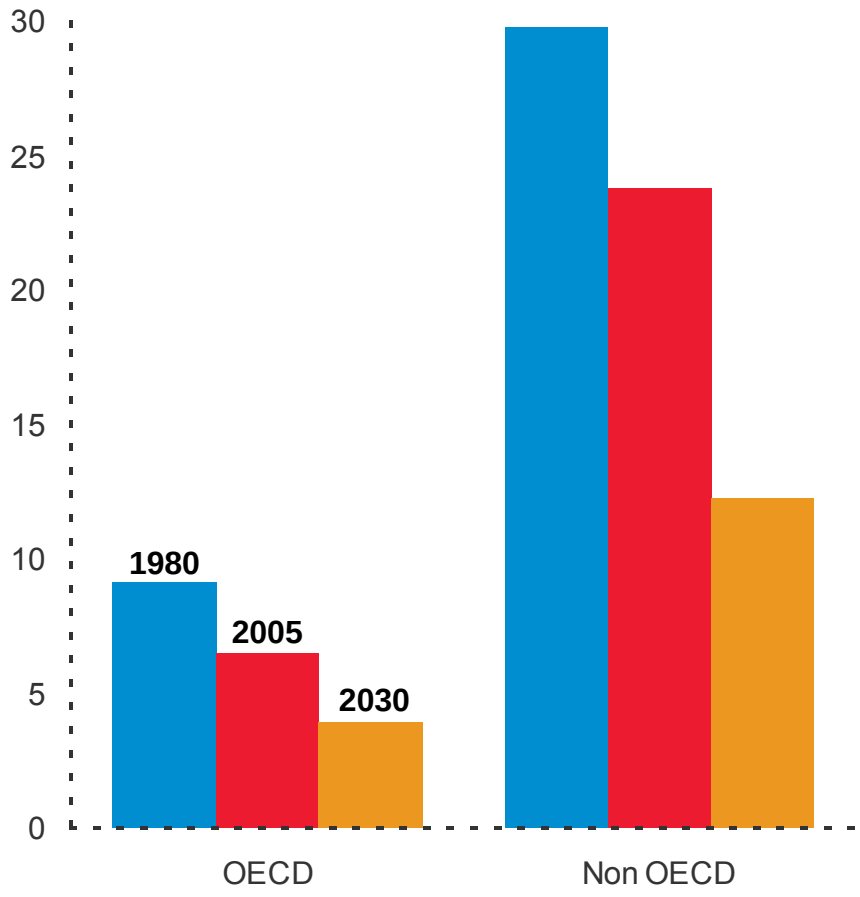
Efficiency Key to Meeting Demand



Demand
Quadrillion BTUs

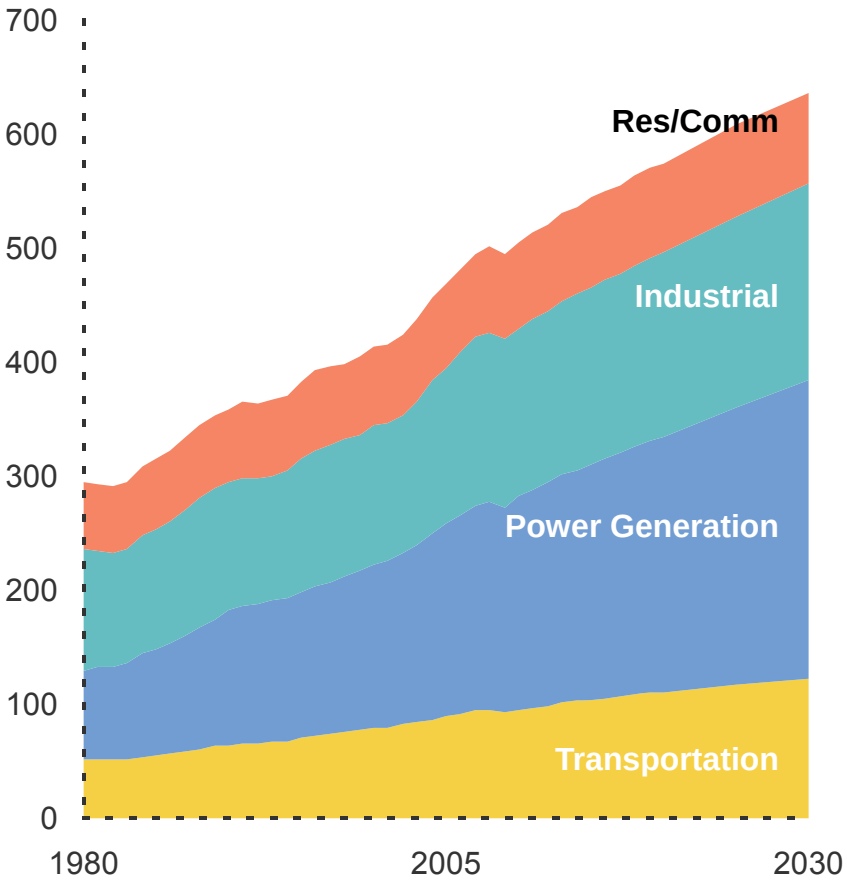


Energy Intensity
MBTU/2005$k GDP

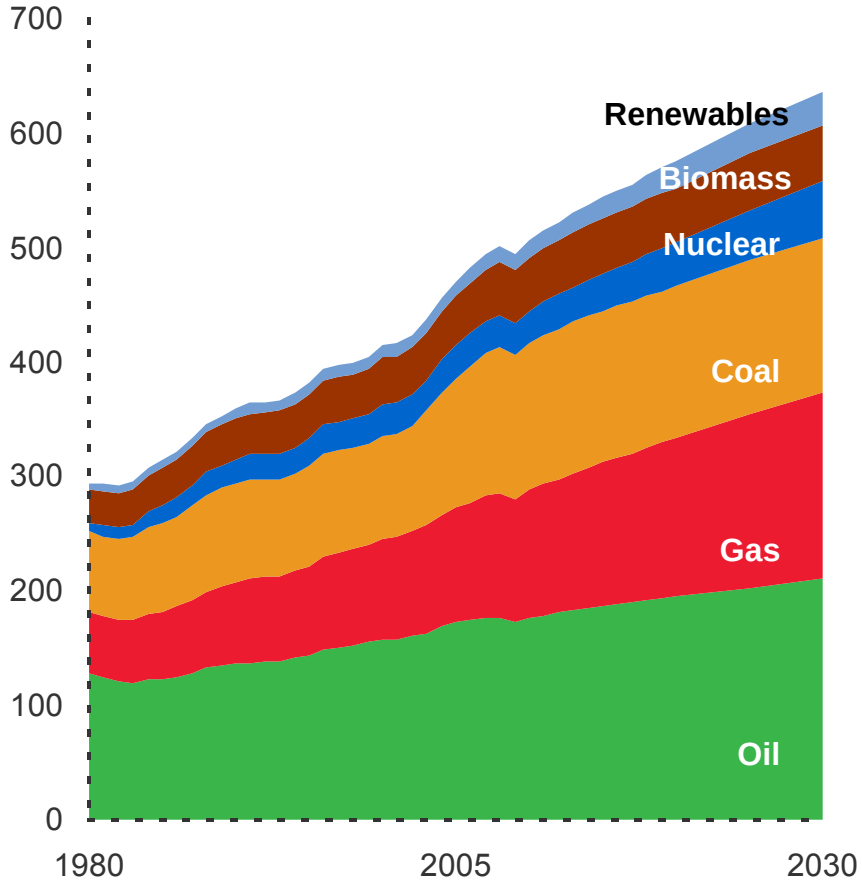


Global Demand

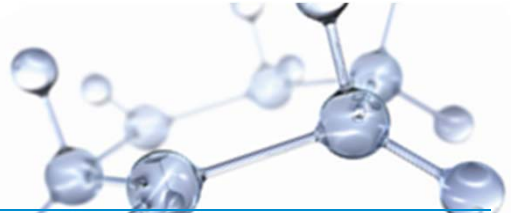
By Sector
Quadrillion BTUs

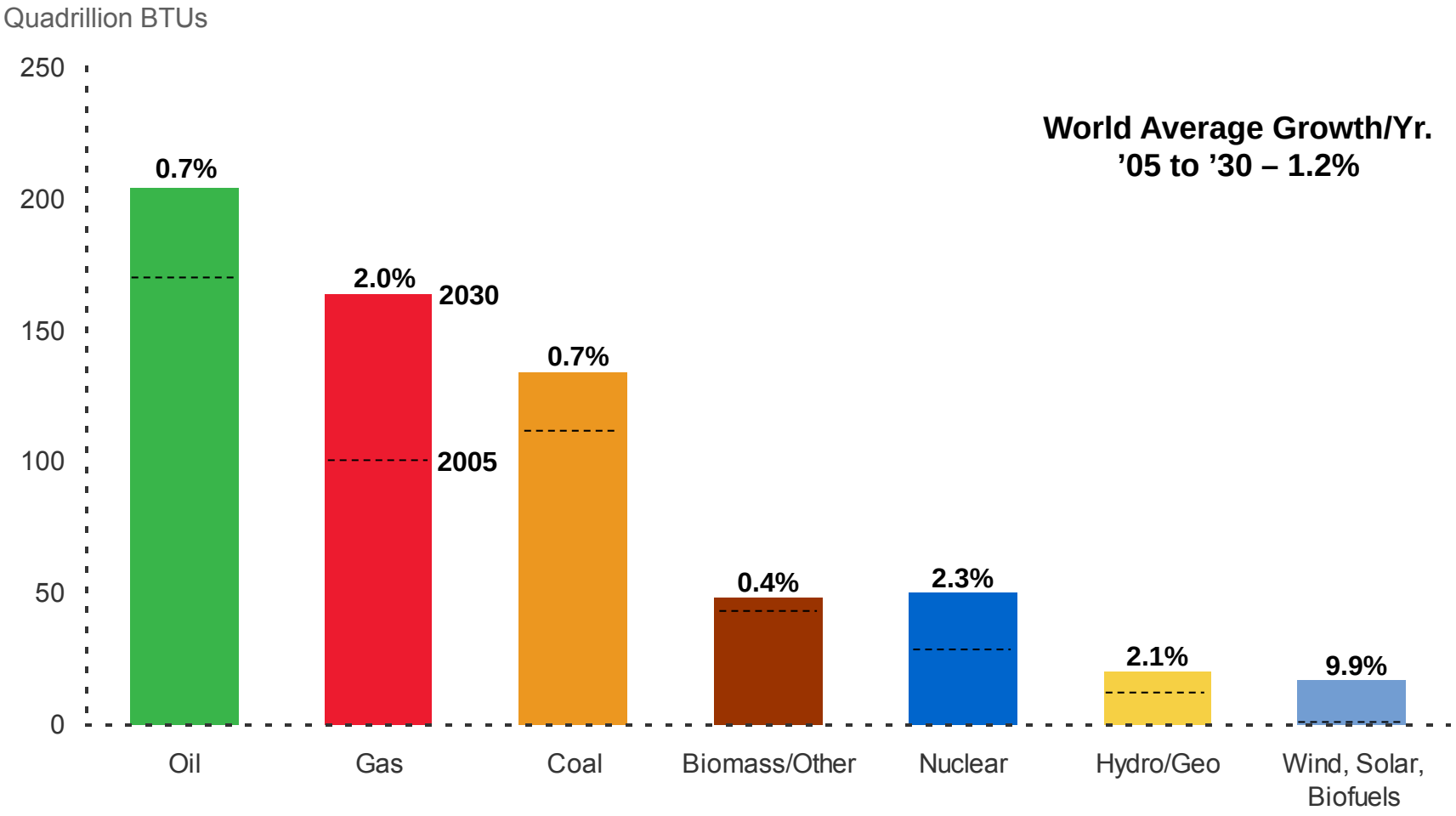


By Fuel
Quadrillion BTUs

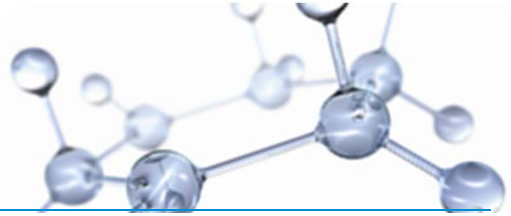


Energy Mix Continues to Evolve



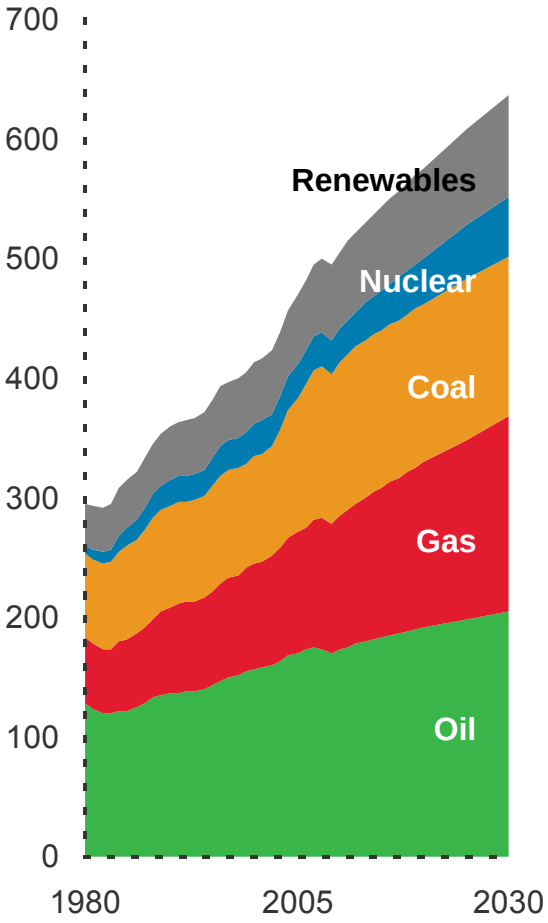


Diverse Fuel Mix Meets Demand



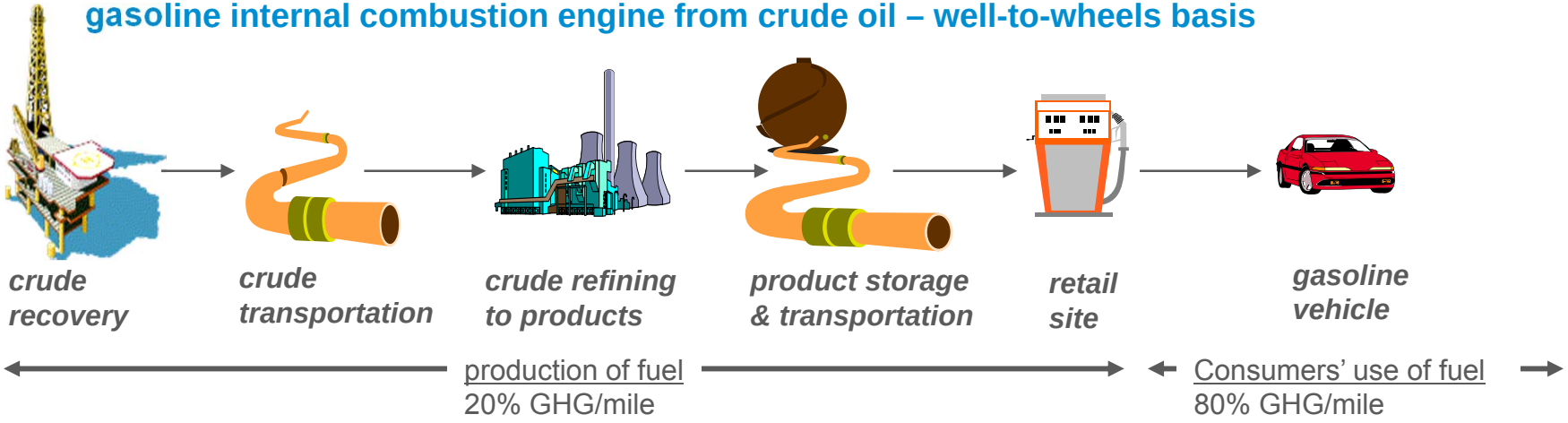
Primary Energy

Quadrillion BTUs



Technologies for GHG Reduction

gasoline internal combustion engine from crude oil – well-to-wheels basis



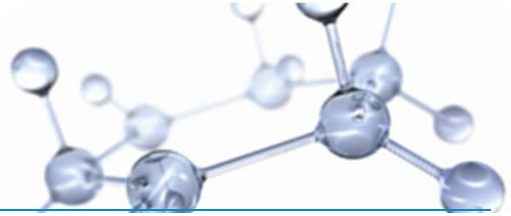
technologies for fuel production

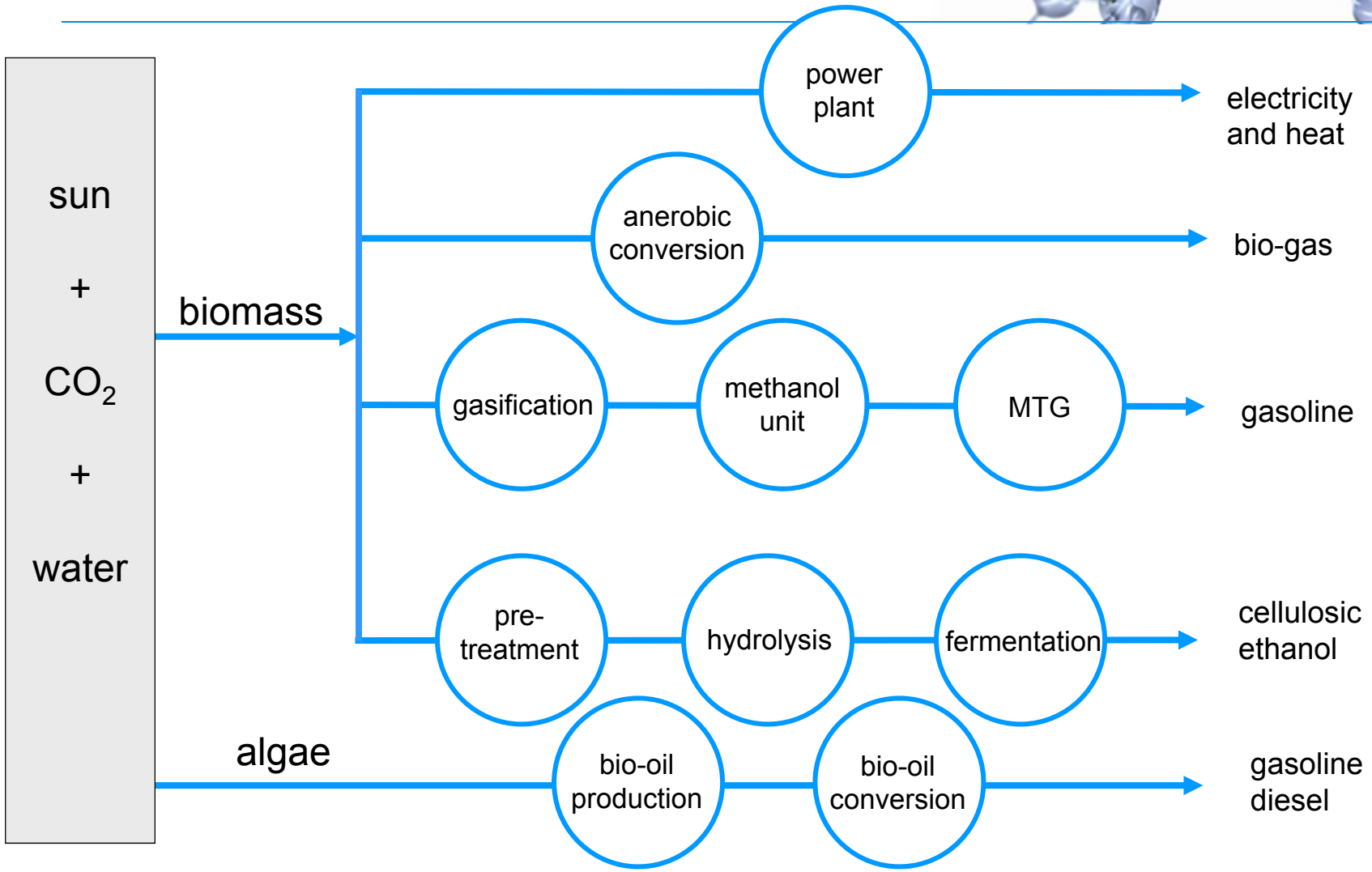
shorter-term
- energy efficiency
- flare reduction
- cogeneration

longer-term
- second generation bio-fuels
- Carbon Capture and Storage (CCS)

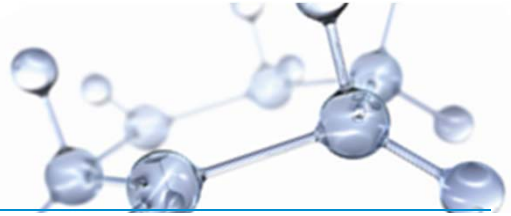
Source: U.S. Basis - WTW Study, Argonne National Lab, 2005

Many bio-energy pathways emerging





Algae-based biofuels

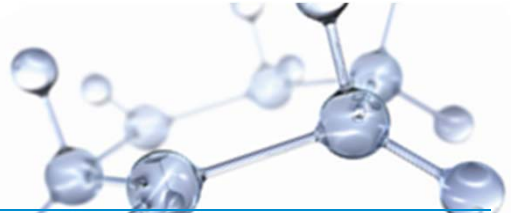


- benefits of using algae for biofuels production:
  - can be grown using land and water unsuitable for food production
  - potentially yield greater volumes of biofuels per acre than other biofuel sources
  - could be used to manufacture biofuels similar to today's transportation fuels
  - growing algae consume CO_2; algae-based biofuels could provide GHG mitigation benefits versus conventional fuels

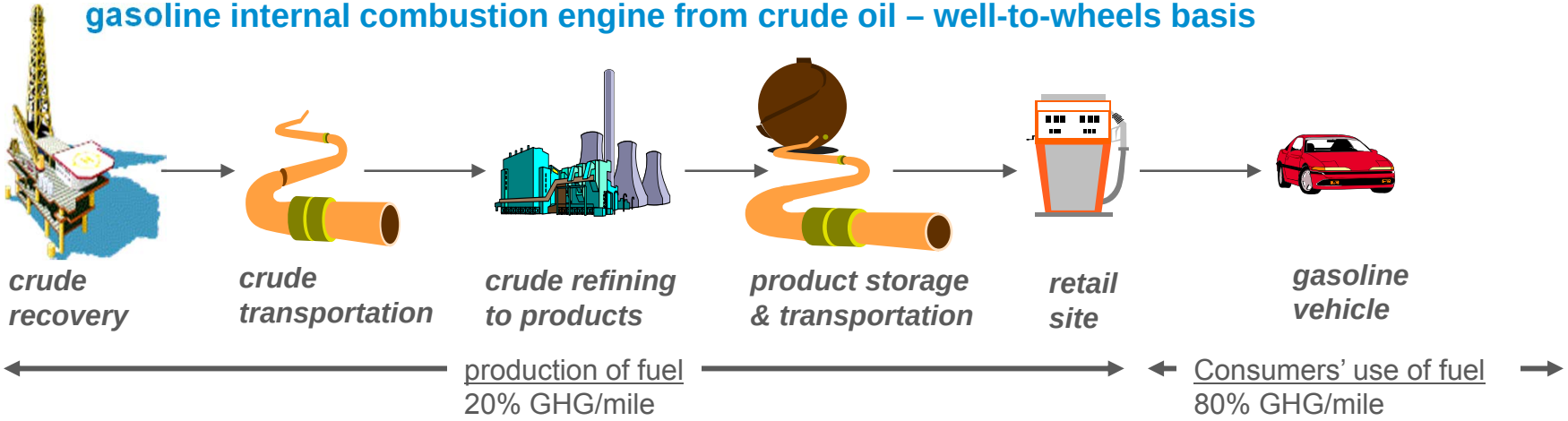
Sunlight | **Carbon Dioxide** | **Water** | **Algae** | **More Algae Containing Hydrocarbons** | **Oxygen**

- ExxonMobil alliance with Synthetic Genomics Inc
  - focus on development of advanced biofuels from photosynthetic algae
  - complements ExxonMobil's ongoing efforts to advance breakthrough technologies to meet the world's energy challenges

Technologies for GHG Reduction



gasoline internal combustion engine from crude oil – well-to-wheels basis



technologies for fuel production

shorter-term
- energy efficiency
- flare reduction
- cogeneration

longer-term
- second generation bio-fuels
- Carbon Capture and Storage (CCS)

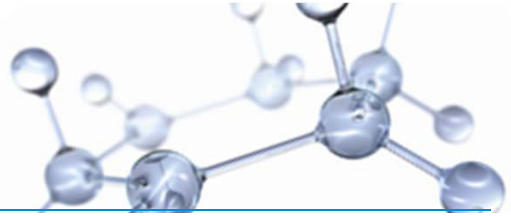
technologies for consumers' use of fuel

shorter-term
- conventional vehicle technology improvements
  - engines, transmissions, body and accessories
- advanced vehicles
  - hybrids, advanced diesel engines

longer-term
- breakthrough vehicles
  - "HCCI" or "CAI"; hydrogen fuel cells
  - plug-in hybrid, battery electric vehicles

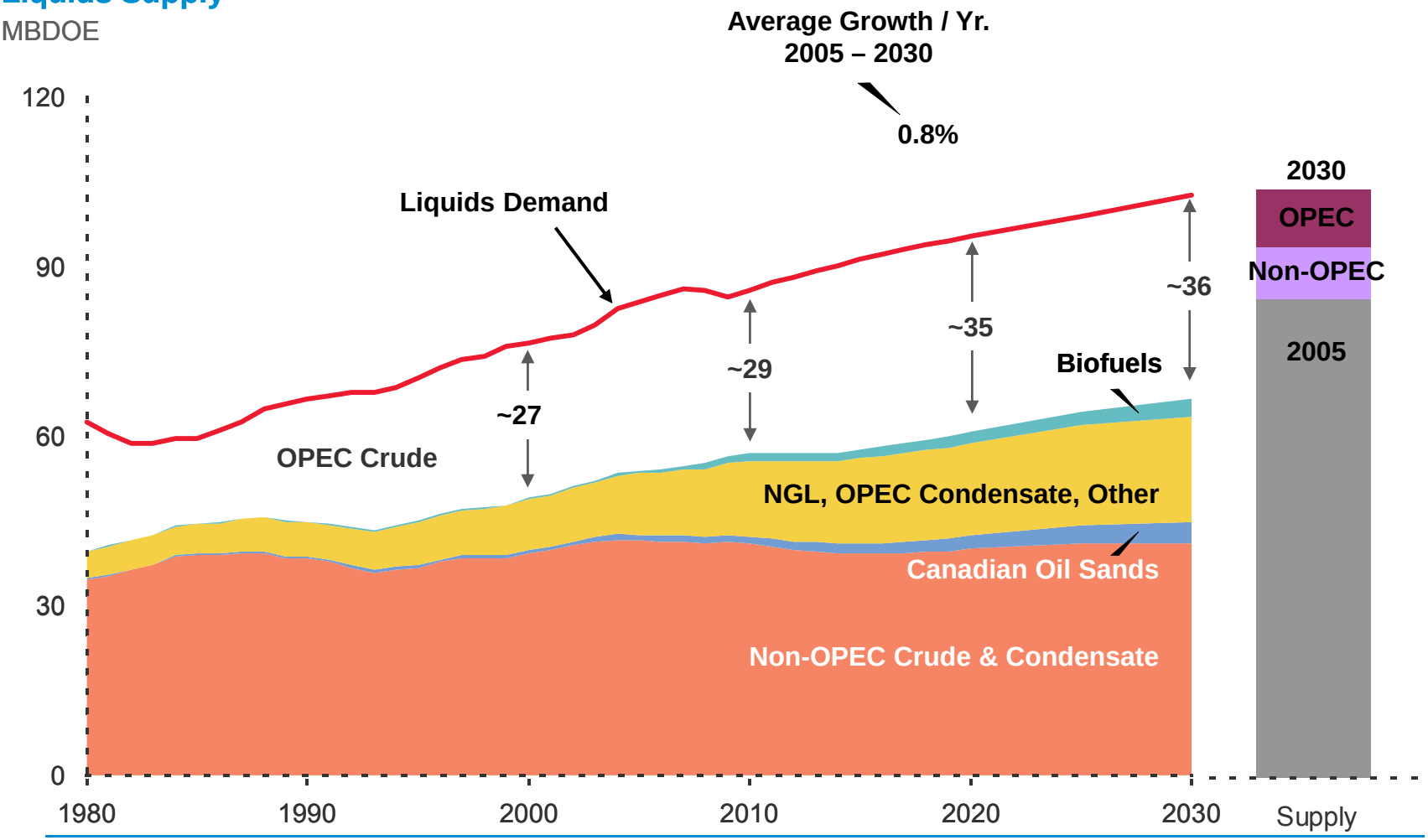
Source: U.S. Basis - WTW Study, Argonne National Lab, 2005

Liquids Support Growing Demand



Liquids Supply

MBDOE



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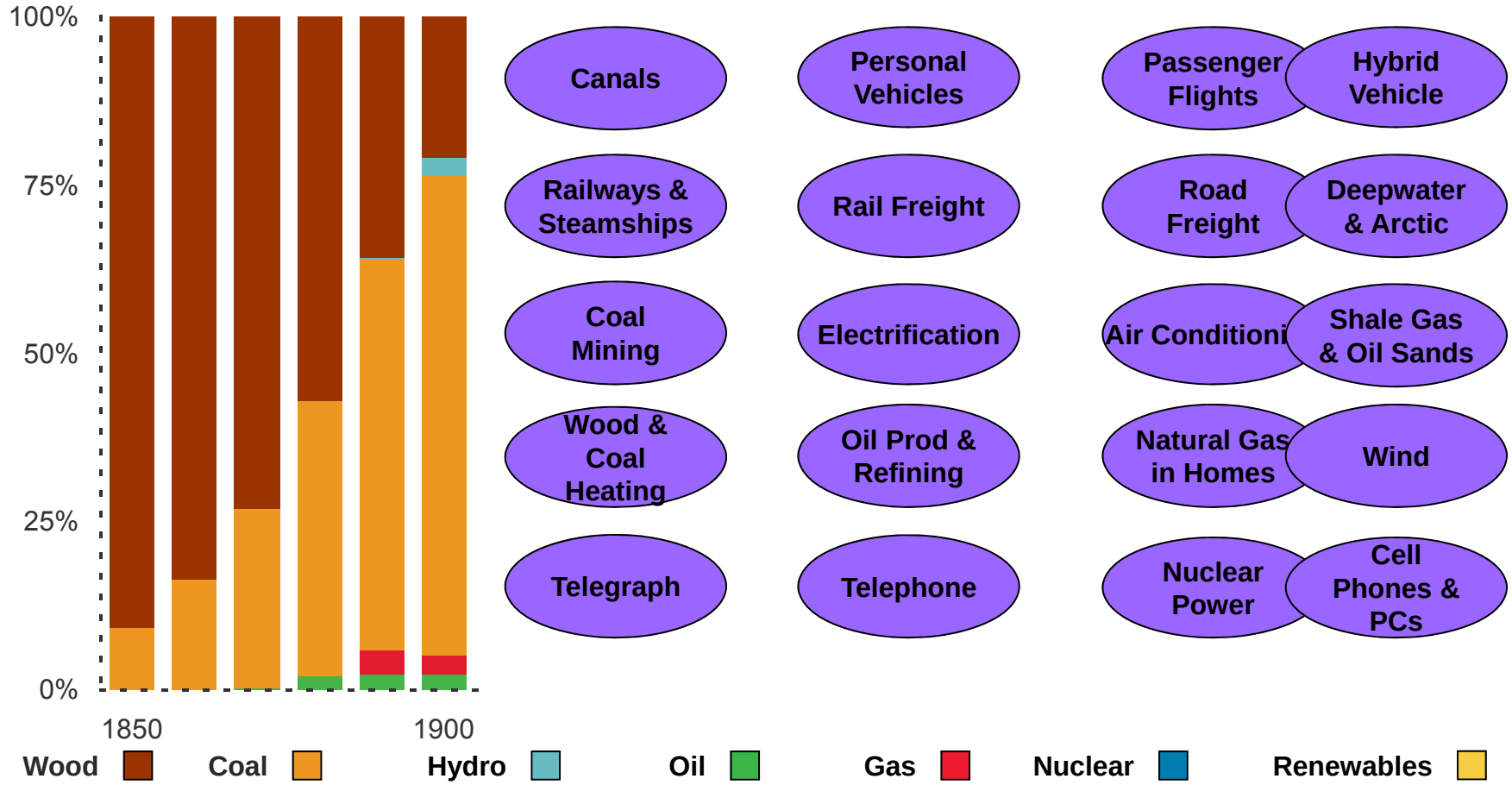
Transition to Modern Energy / Technology

US Energy Demand

Percent



ExxonMobil 2010 Energy Outlook

Energy Information Agency

ExxonMobil

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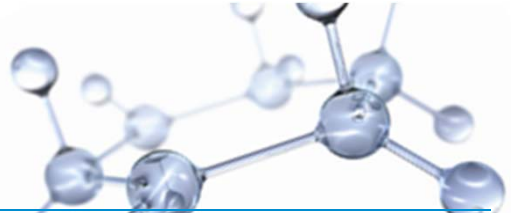
In thirty minutes today…



Residential electricity demand is equal to 1,100 Hoover Dams.

The world used enough jet fuel to make 240 transatlantic flights.

The world produced enough steel to build 10 Eiffel Towers.

1.3 million personal vehicles filled their gas tanks.

The world used enough electricity to power London for 8 days.

World gas consumption could fill 70,000 hot-air balloons.

Development Challenges and Solutions

World development continues, while lives improve and economies grow

Increase Efficiency

8 billion people
100% increase in global GDP

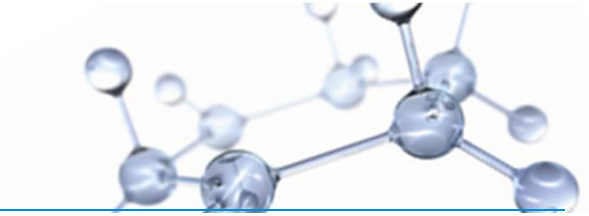
35% increase in energy demand
300 quadrillion BTUs saved via efficiency

Technology

All reliable, affordable energy supplies needed

Mitigate Emissions

Expand Supplies

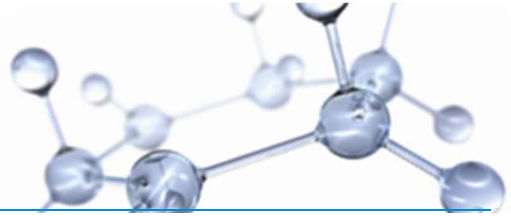


ExxonMobil™

Algae-based biofuels – key challenges

- ExxonMobil and Synthetic Genomics will develop innovative solutions to the challenges of large scale production and commercialization of algae-based biofuels
  - 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

ExxonMobil – SGI alliance



algae growth → algae harvesting → bio-oil recovery → bio-oil transport & storage → bio-oil conversion → biofuel products

- R&D program
  - targets production of bio-oils from photosynthetic algae for conversion to advanced biofuels compatible with today's vehicle and fuels infrastructure
  - if R&D milestones are successfully met, ExxonMobil expects to spend more than $600M

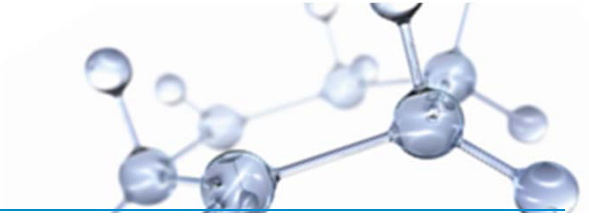
ExxonMobil

- Leadership role in engineering, process development and scale up
- Key role in upgrading bio-oil produced by photosynthetic algae into finished products, and total process integration for development and commercial applications

SYNTHETIC GENOMICS®

- Leadership role in biological research for algae strain development, growth and harvesting
- Key role in bio-oil recovery research and development

ExxonMobil: improving efficiency



- **Lithium-ion battery technology**

  Innovative film separator could help put more fuel-efficient hybrid and plug-in electric vehicles on the road

- **Advanced synthetic lubricants**

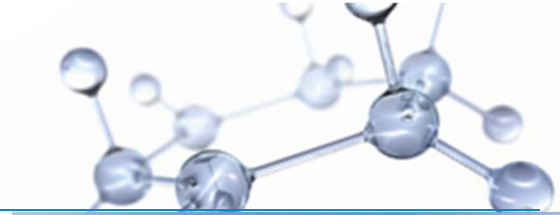
  Mobil 1 AFE can improve fuel economy by up to 2 percent[1] versus most commonly used motor oils

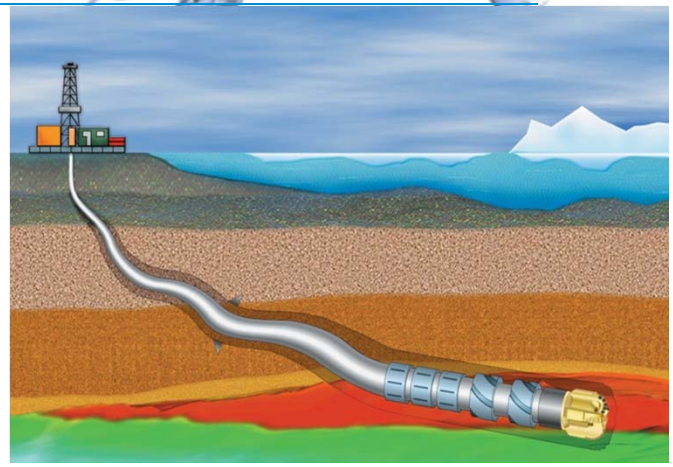
- **Cogeneration**

  Process used at about 100 plants[2] worldwide to capture and use heat generates electric power up to 50% more efficiently than local utilities

[1] Actual savings are dependent upon vehicle/engine type, outside temperature, driving conditions, and current engine oil viscosity. [2] In which ExxonMobil has interests.

ExxonMobil: expanding supplies



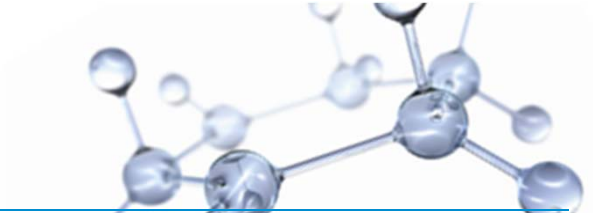


- **Directional drilling**
  Record-setting horizontal wells stretching 7+ miles enable us to produce more oil with less environmental impact

- **Unconventional and liquefied natural gas**
  Multi-Zone Stimulation Technology™, allows us to produce “tight gas”; large-scale Q-Max tankers allow us to safely and efficiently deliver natural gas to markets worldwide.

- **Algae biofuels**
  ExxonMobil is investing up to $600 million to develop oils that are compatible with existing transportation technology and infrastructure from photosynthetic, CO_2-consuming algae

ExxonMobil: reducing emissions



- **Natural gas**

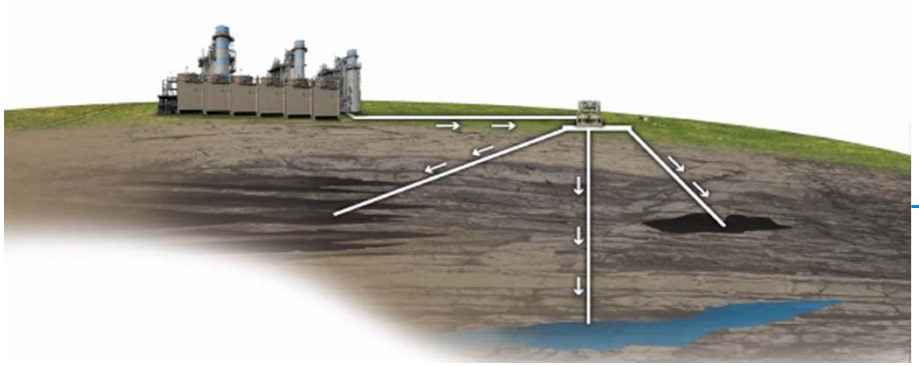
  ExxonMobil is a global leader in production of natural gas, electricity from natural gas emits up to 60 percent less CO_2 than coal

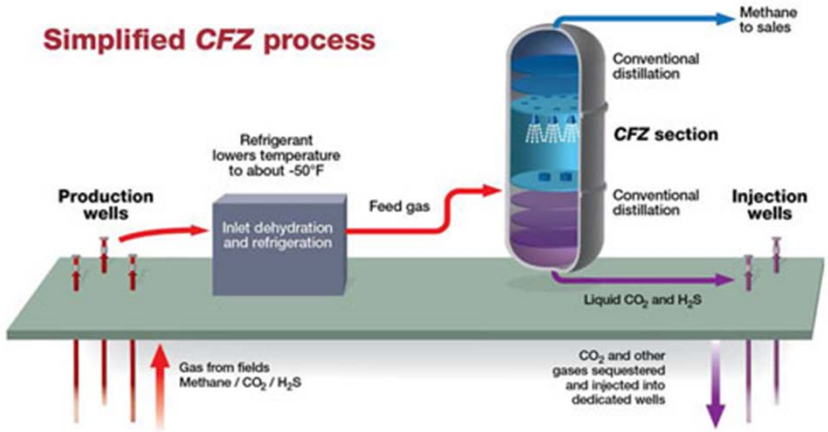
- **Controlled Freeze Zone™**

  This technology, which reduces the cost and complexity of separating CO_2 from produced natural gas, could help carbon capture and storage systems reduce GHG

- **Carbon capture and storage**

  As a leader in CCS, ExxonMobil has captured up to 4 million metric tons of CO_2 per year in Wyoming, and partnered to store 10 million metric tons in the North Sea.





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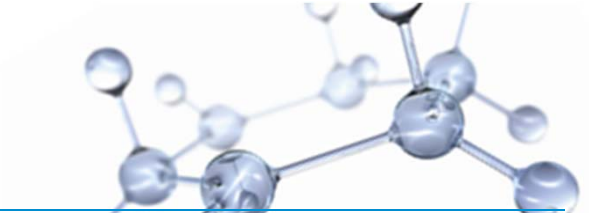

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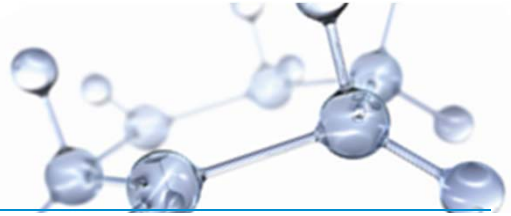
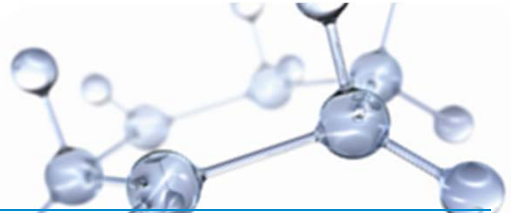
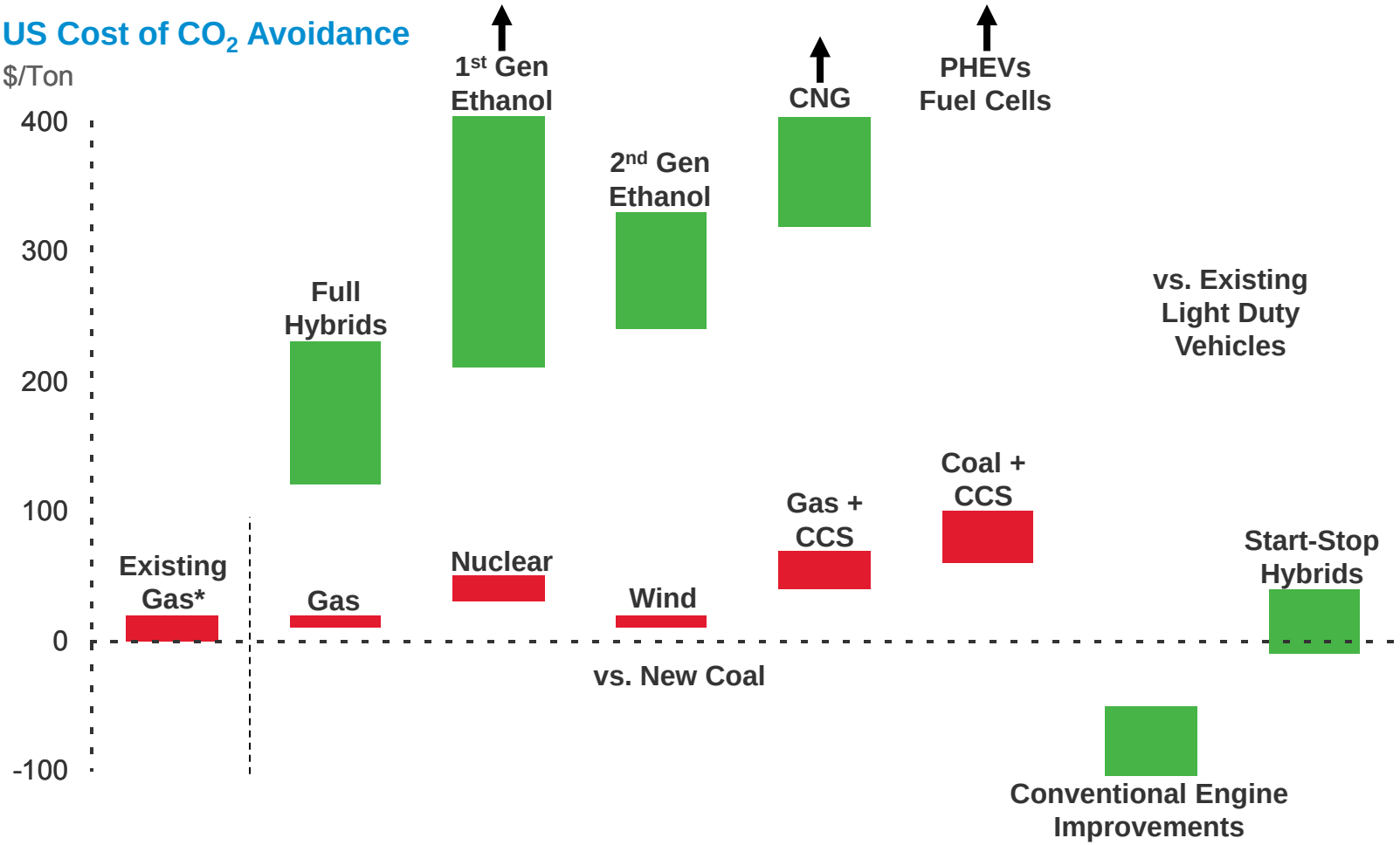


BACKUP SLIDES

CO_2 Abatement Economic in Power





*Higher utilization of existing gas vs. existing coal

Source: JEC (2007), CARB (March 2009), EIA AEO