



# BP Energy Outlook 2030

New York, January 2012



# BP Energy Outlook 2030

Christof Ruehl, Group Chief Economist



# Outline

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## Global energy trends

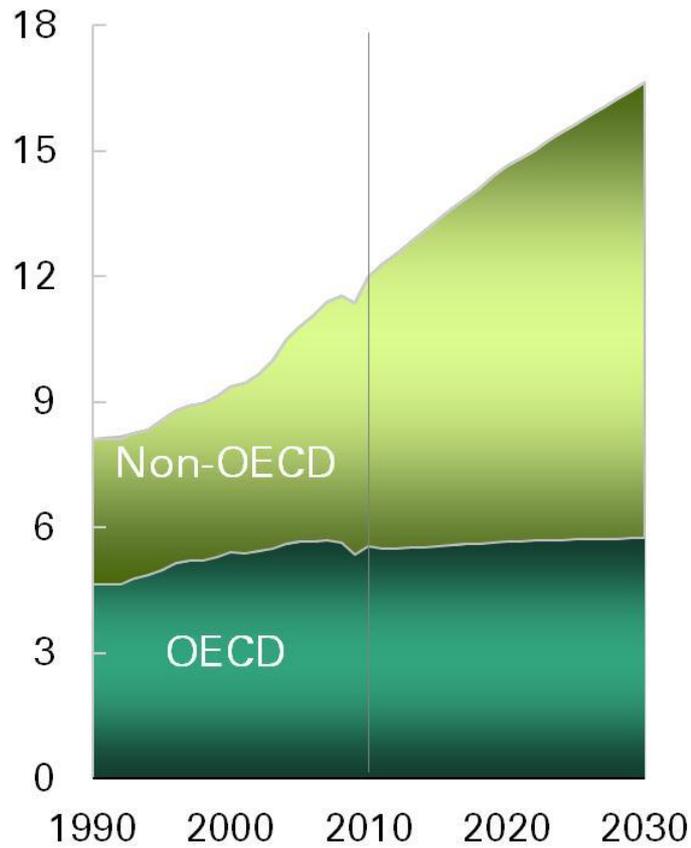
Outlook 2030: Fuel by fuel

Key determinants

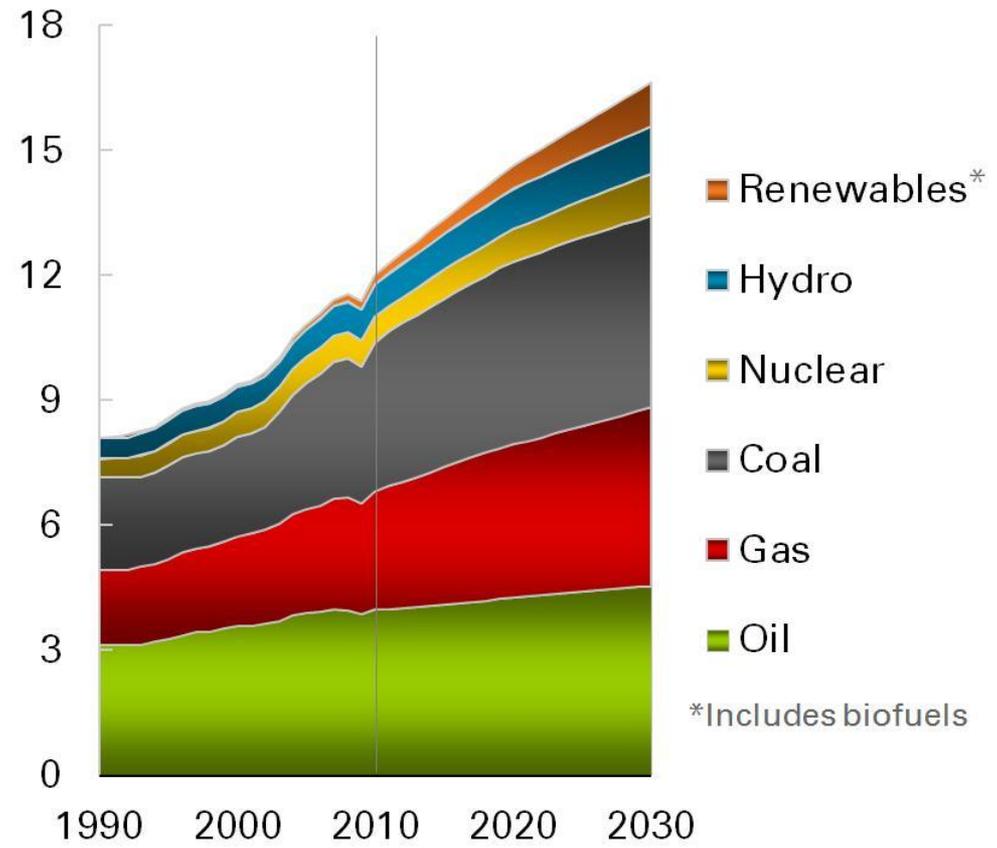
Risks and unknowns

# Non-OECD economies continue to drive consumption growth

Billion toe



Billion toe

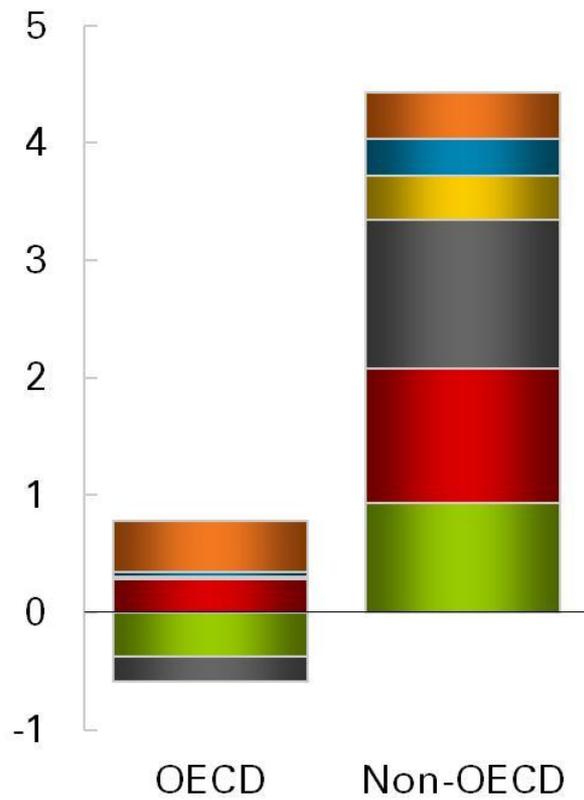


\*Includes biofuels

# Fuel substitution is the main story in the OECD

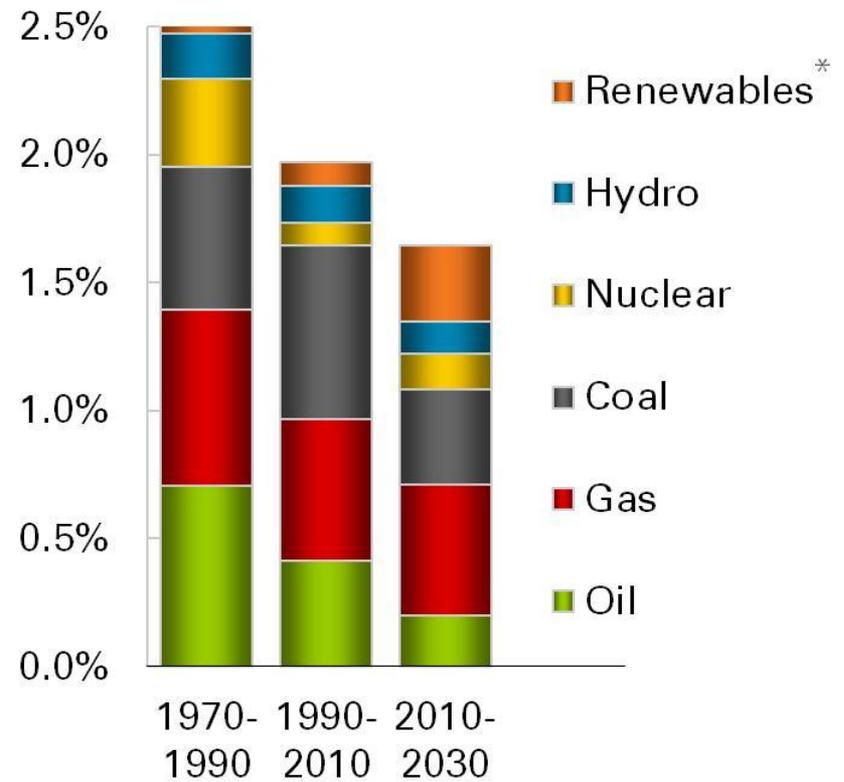
## By fuel and country grouping

Change 2010 to 2030, Billion toe



## Contributions to global growth

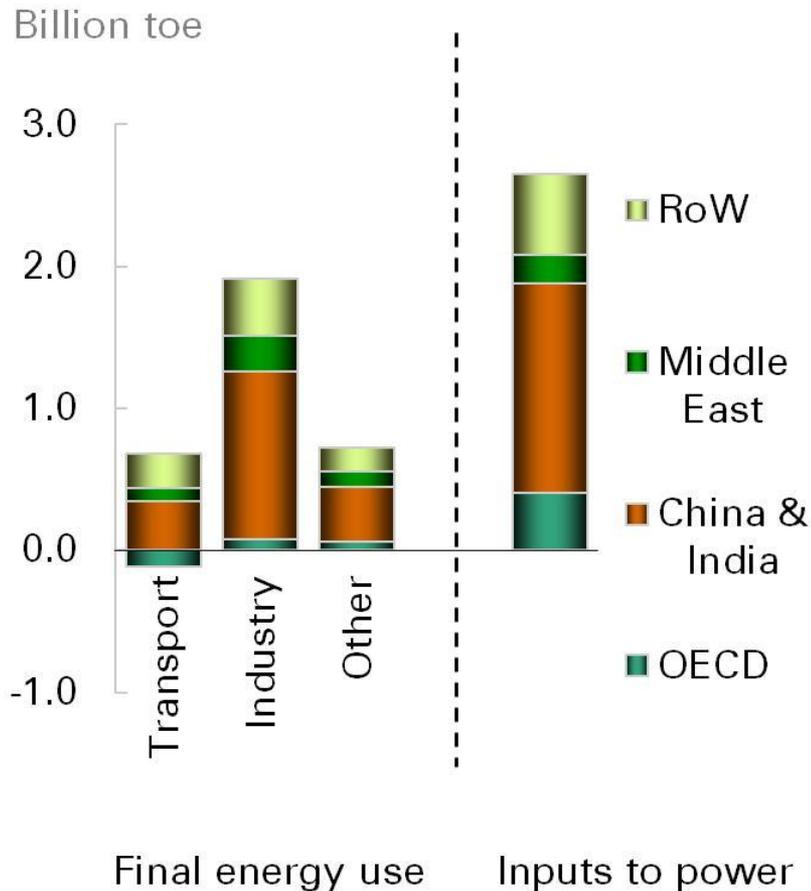
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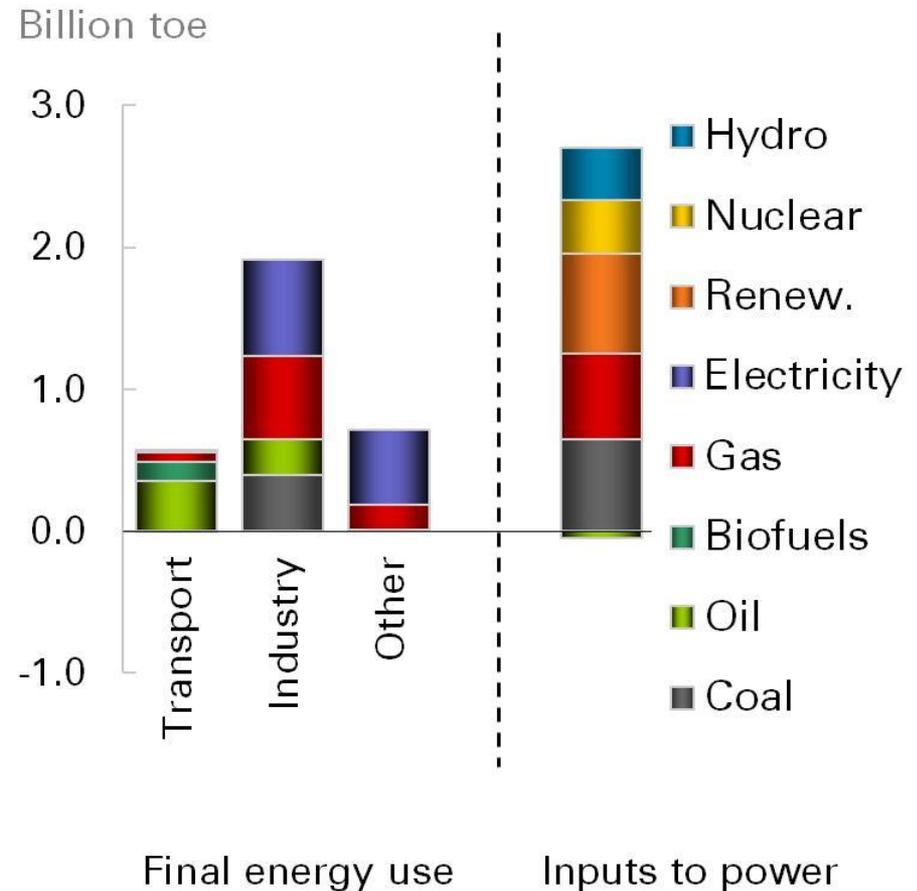
\*Includes biofuels

# Energy consumption growth by sector

## By sector and region to 2030



## By sector and fuel to 2030

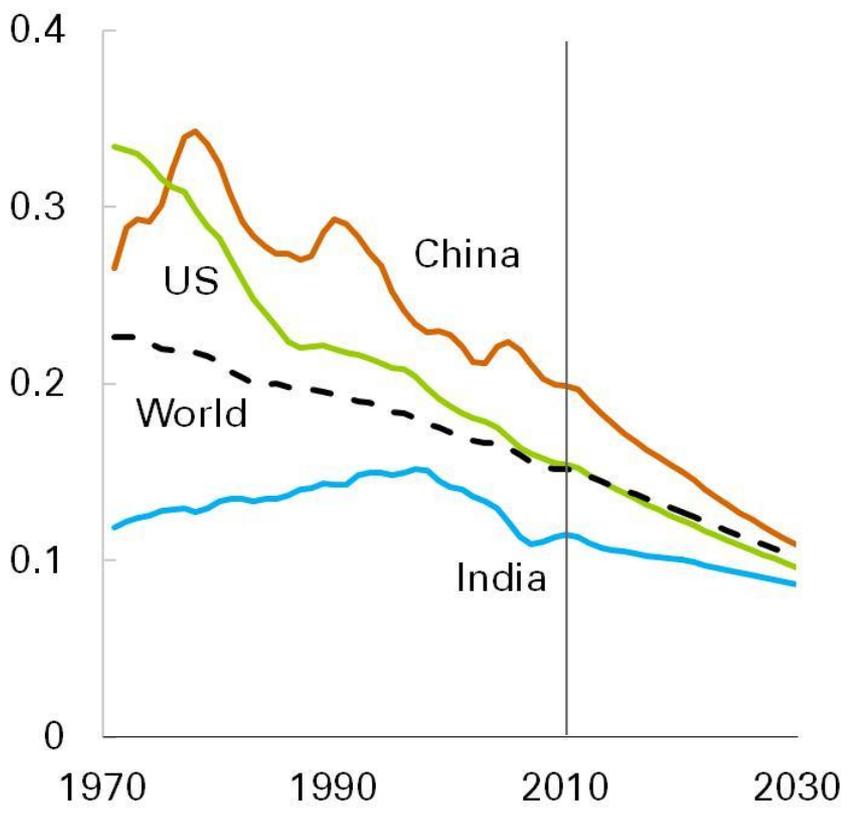




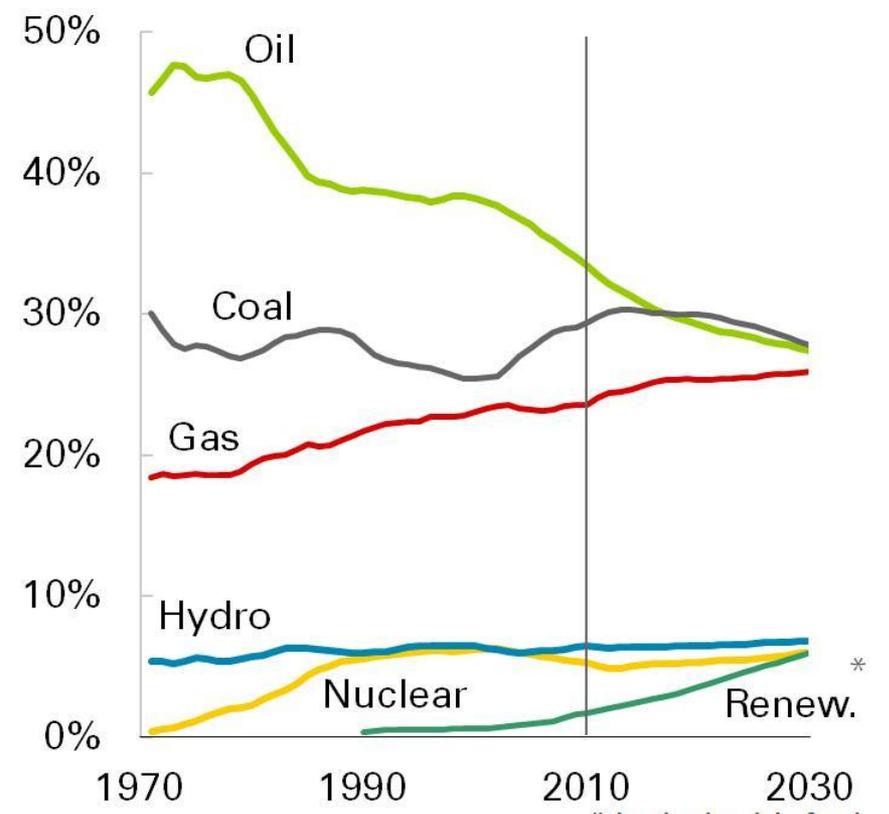
# Convergence of energy intensity and fuel shares

### Energy intensity

Toe per thousand \$2010 GDP



### Shares of world primary energy



\* Includes biofuels

# Outline

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Global energy trends

Outlook 2030: Fuel by fuel

- Liquid fuels

- Natural gas

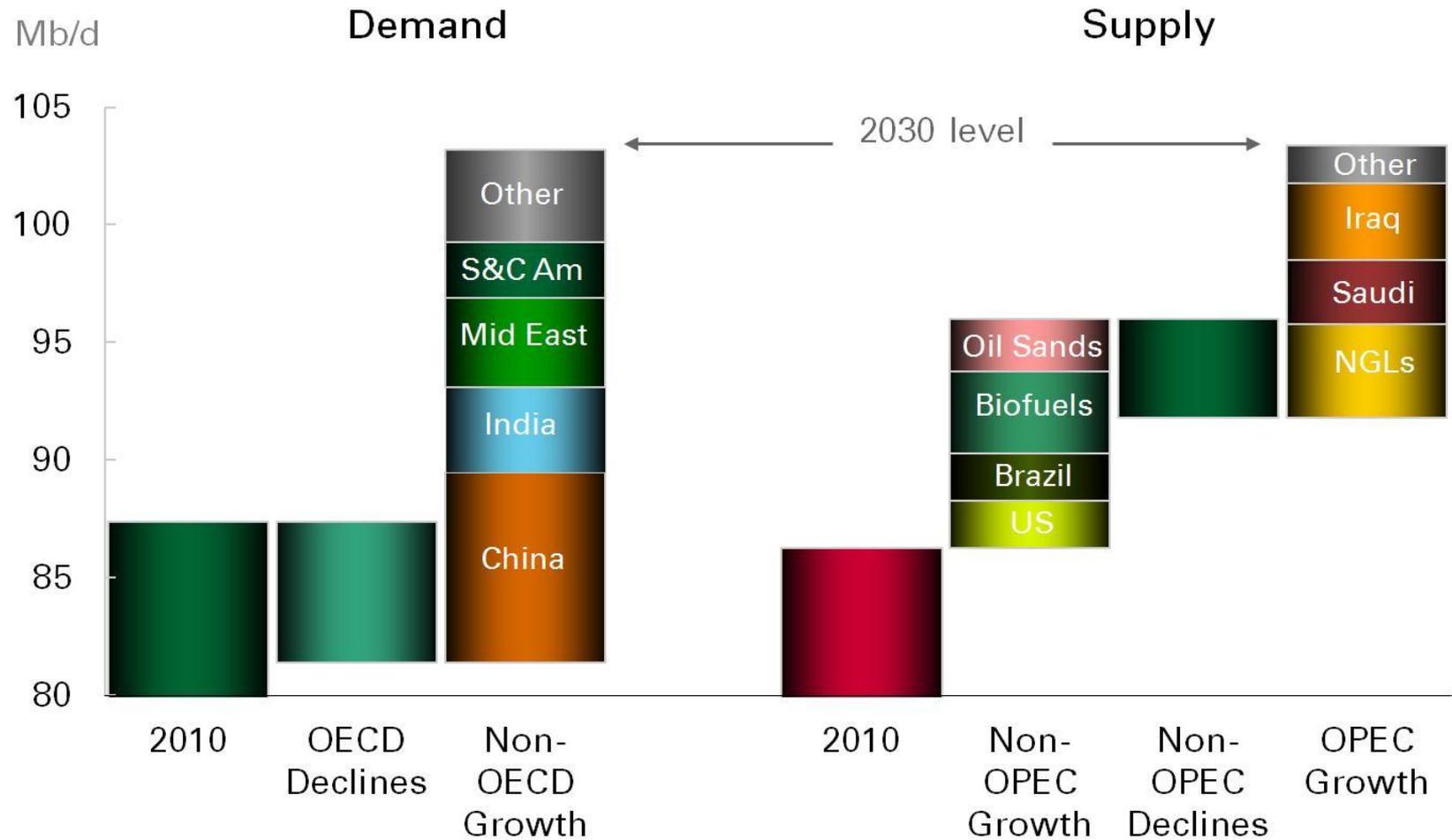
- Coal

- Non-fossil fuels

Key determinants

Risks and unknowns

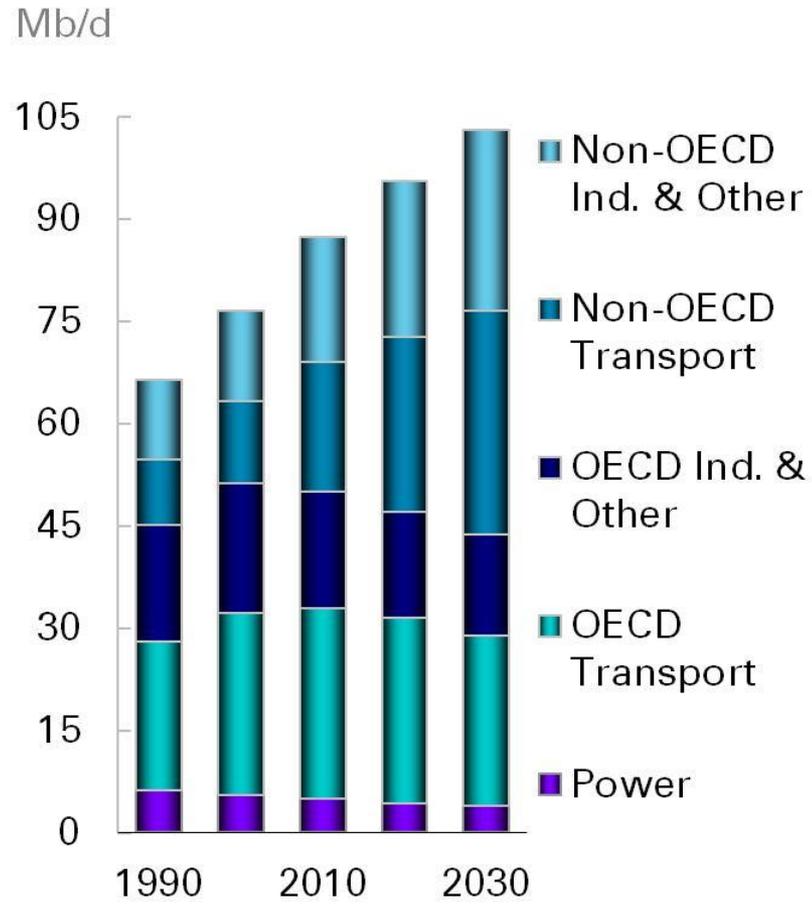
# Global liquids – demand and supply



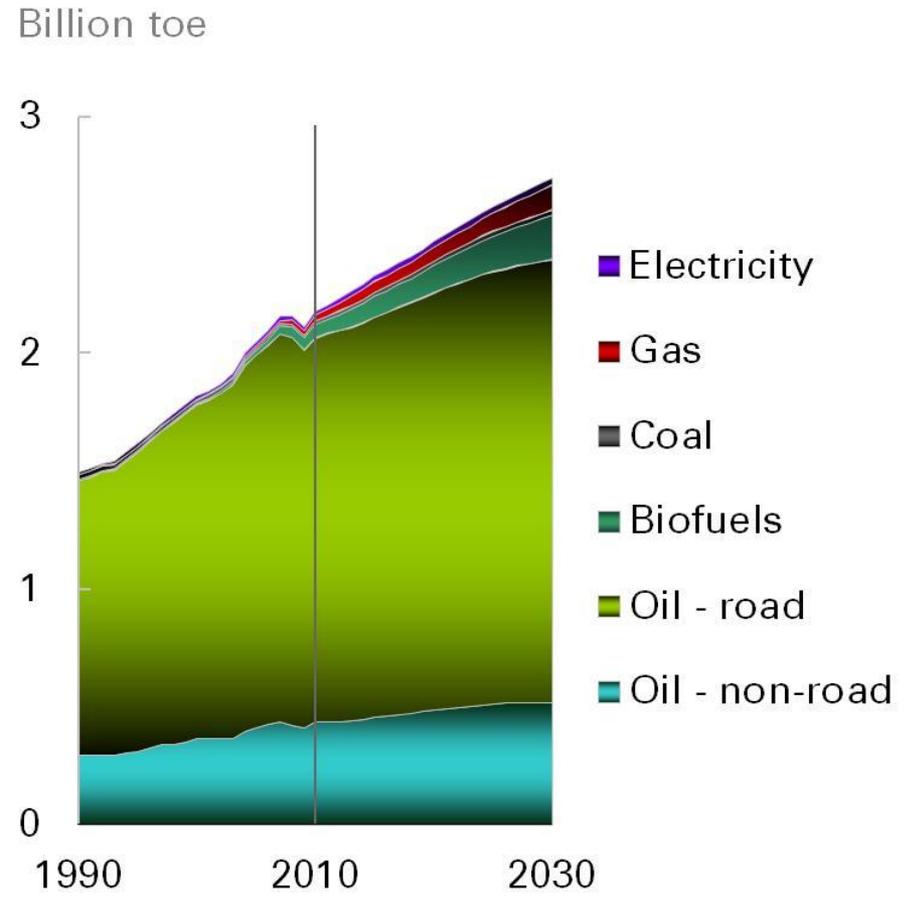


# Liquids demand growth is driven by non-OECD transport

### Liquids demand by sector



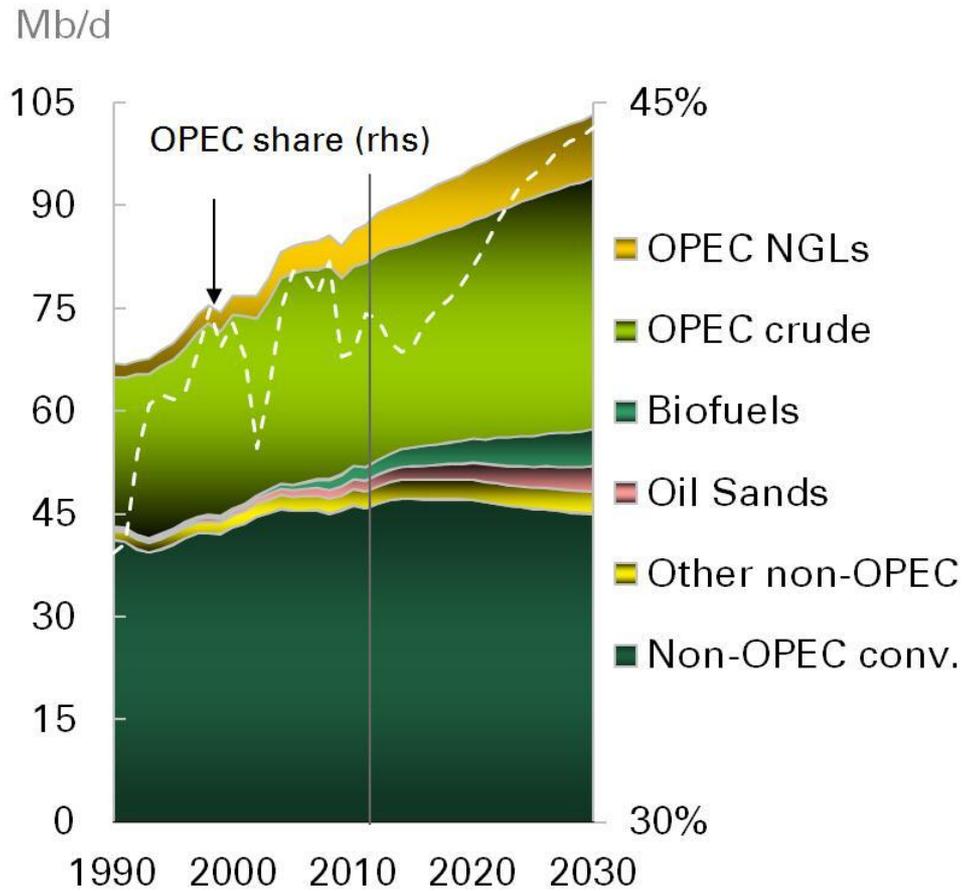
### Transport demand



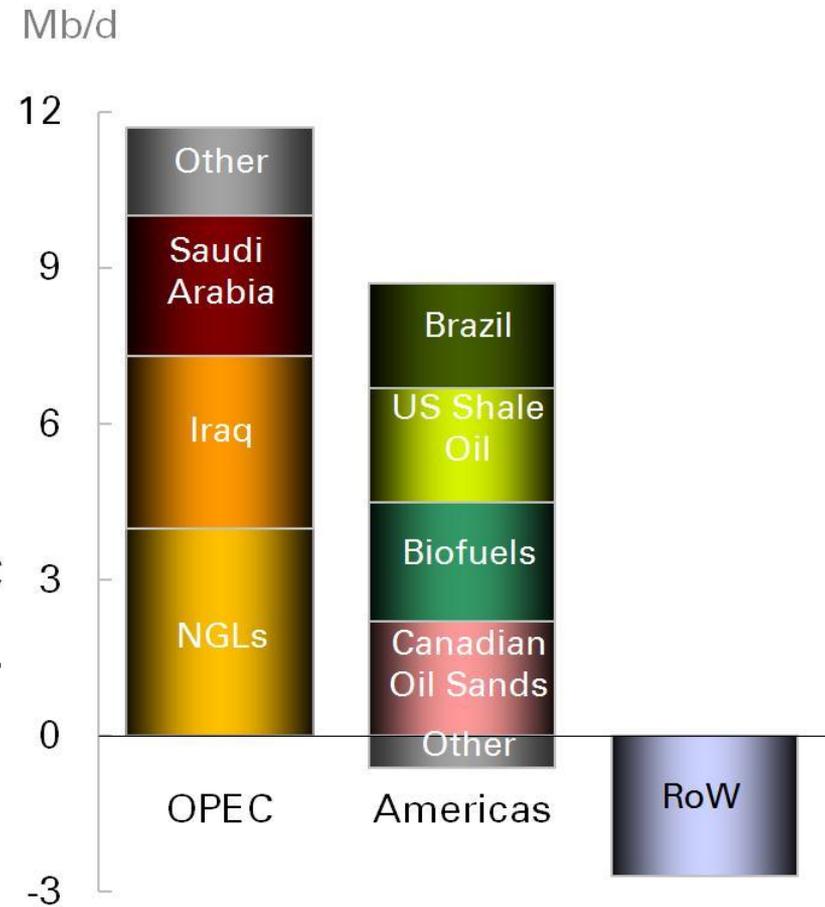


# Liquids supply growth - OPEC and North America

## Liquids supply by type

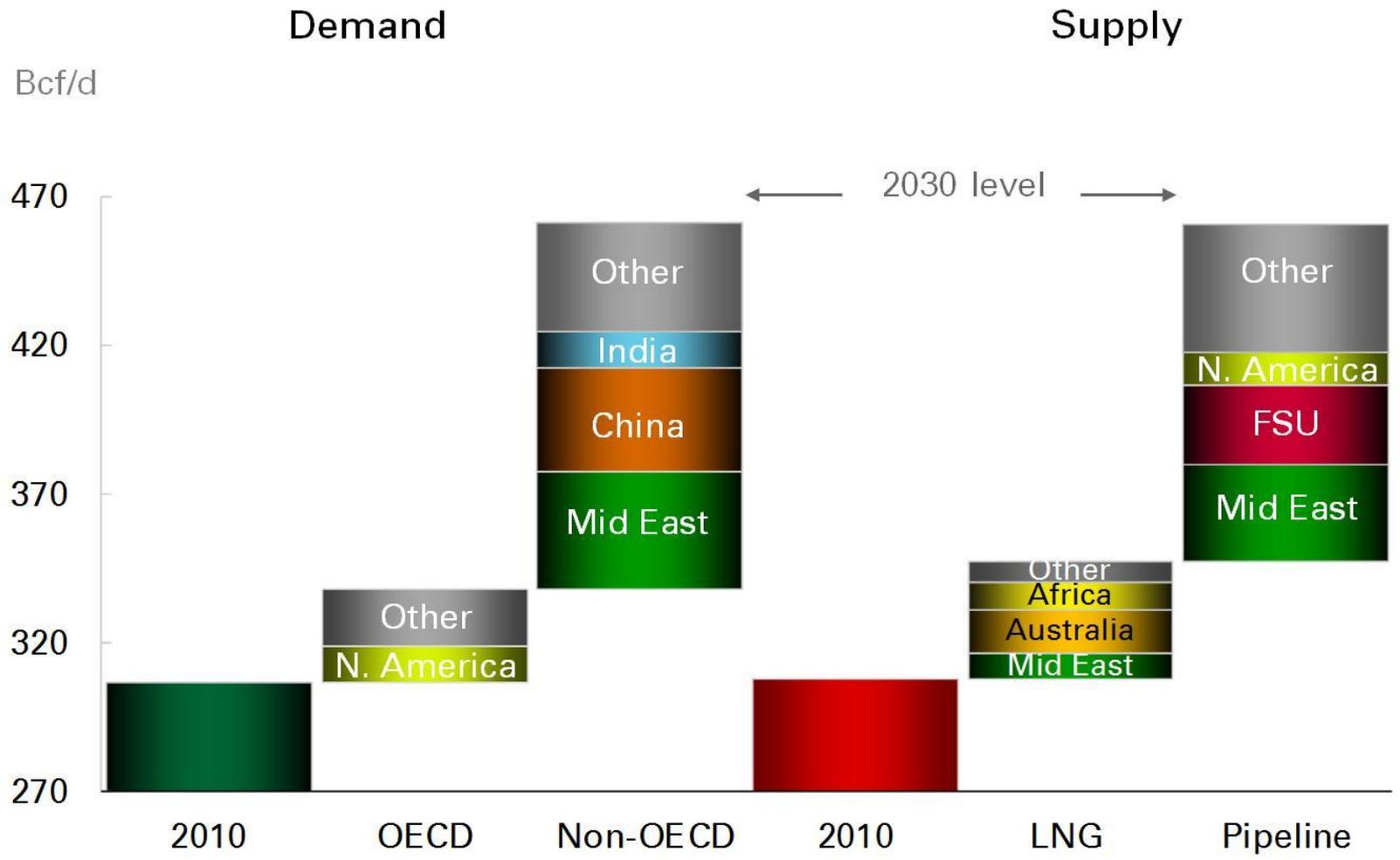


## Growth from 2010 to 2030



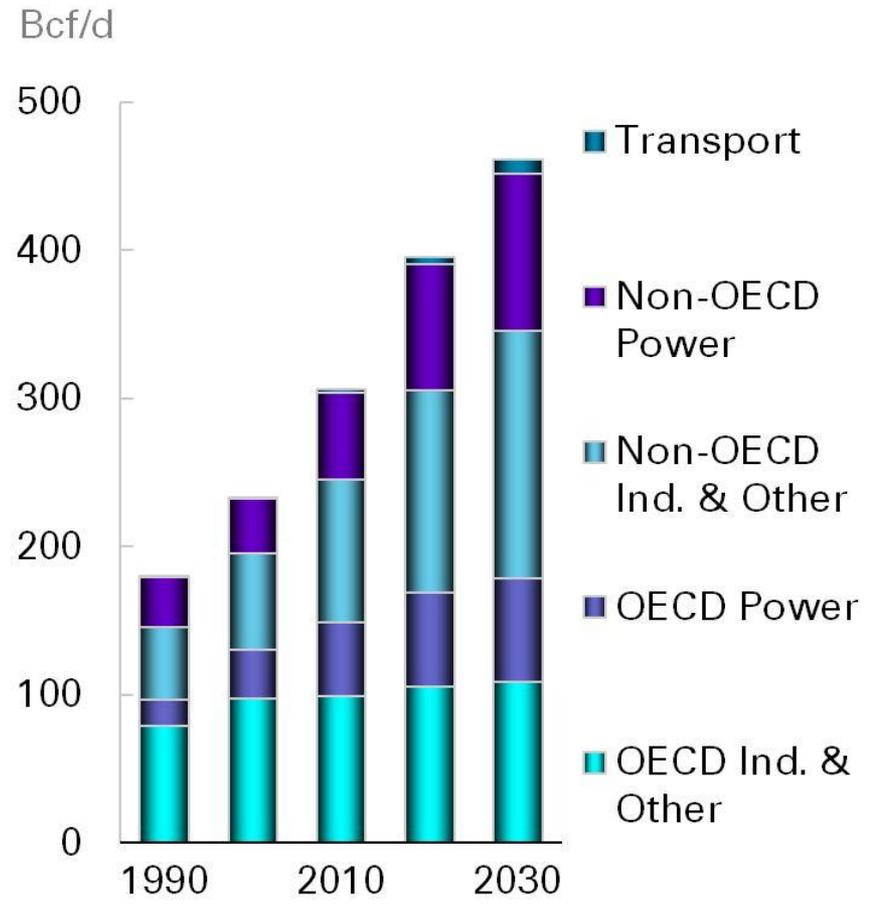


# Natural gas demand growth is concentrated in the non-OECD

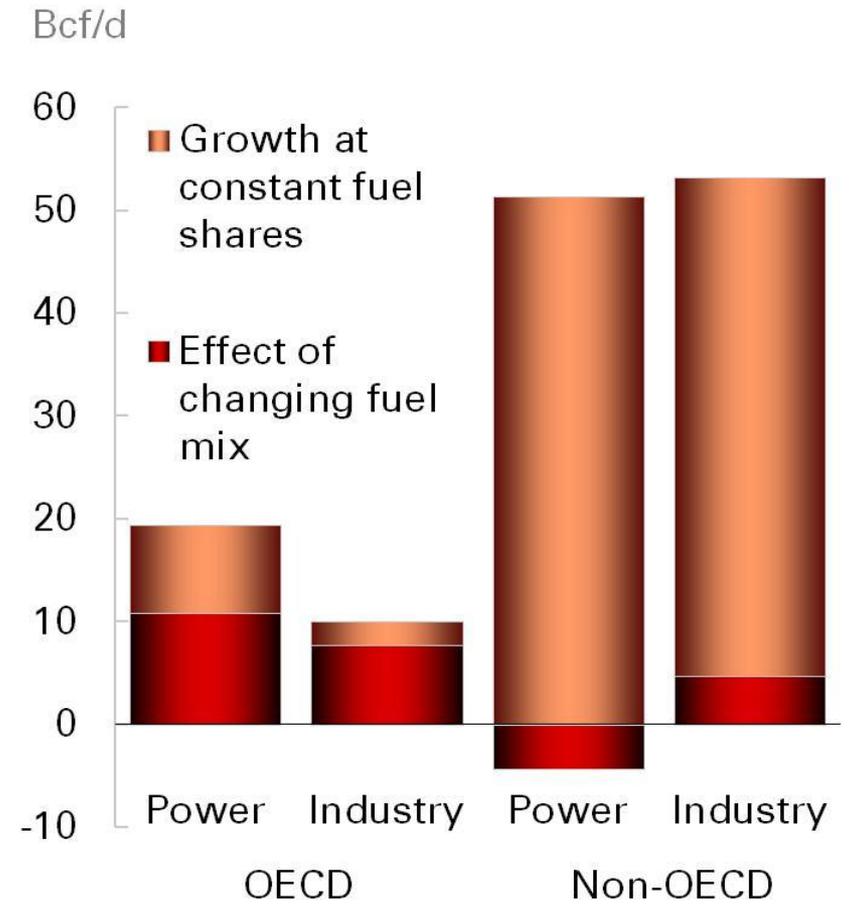


# Fuel substitution in power and industry

## Demand by sector

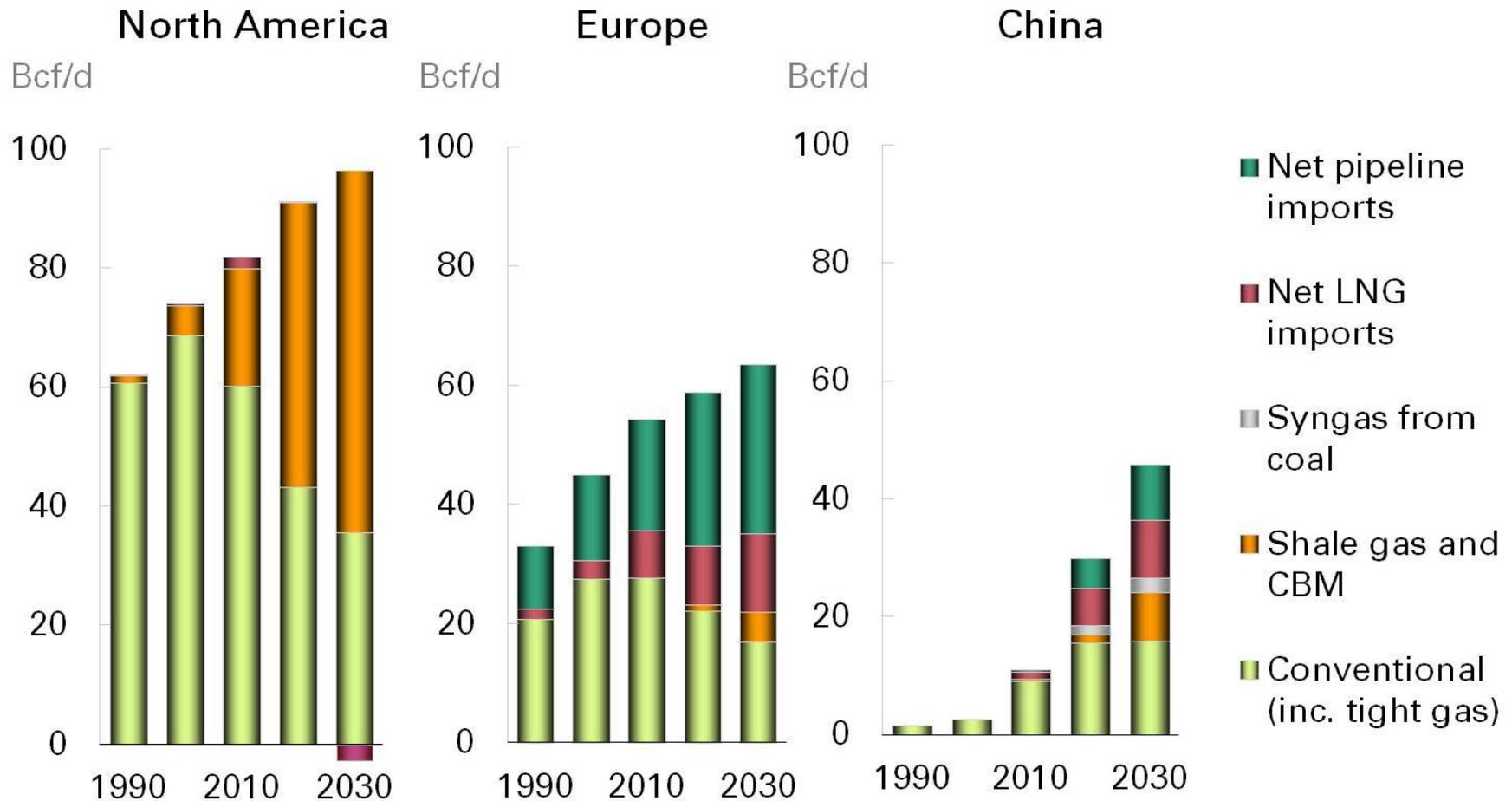


## Gas demand growth 2010-30



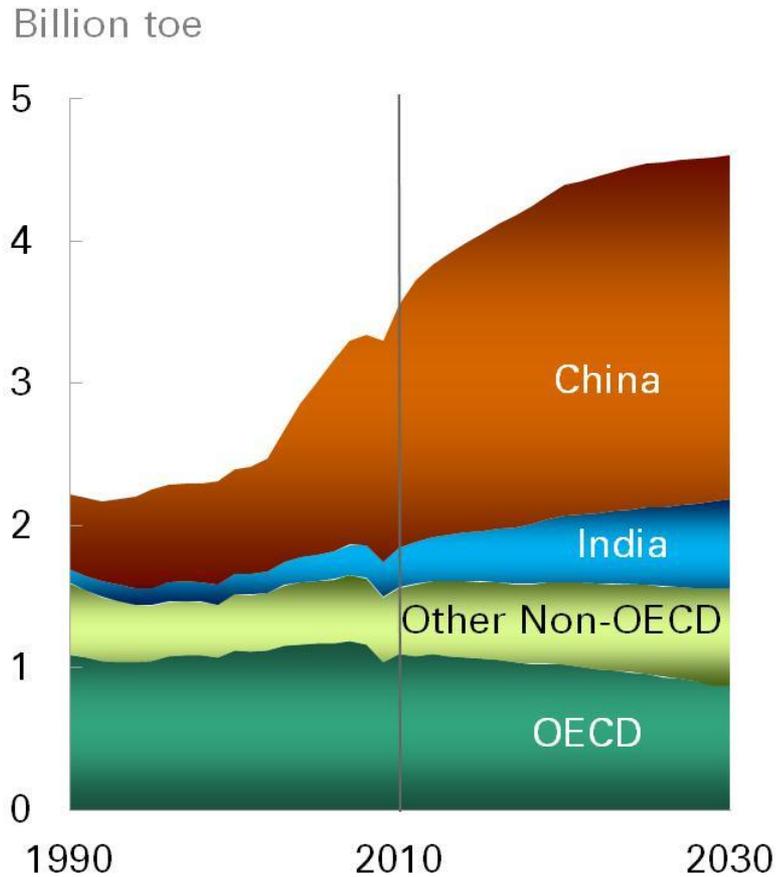
# Unconventional gas will play a growing role

## Gas supply by region

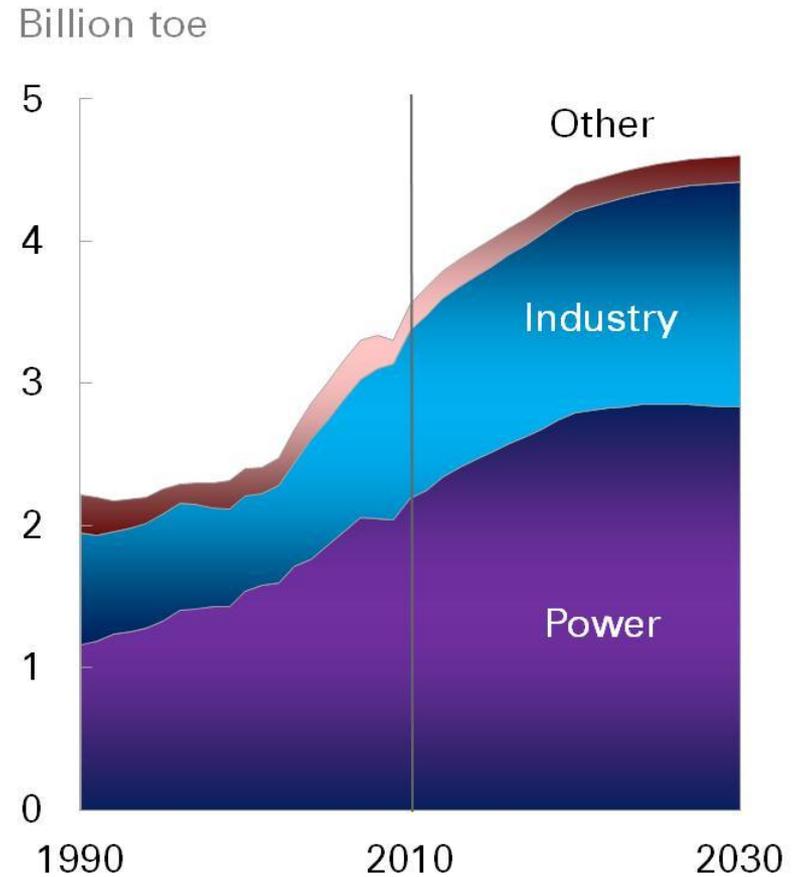


# Coal consumption levels off after 2020

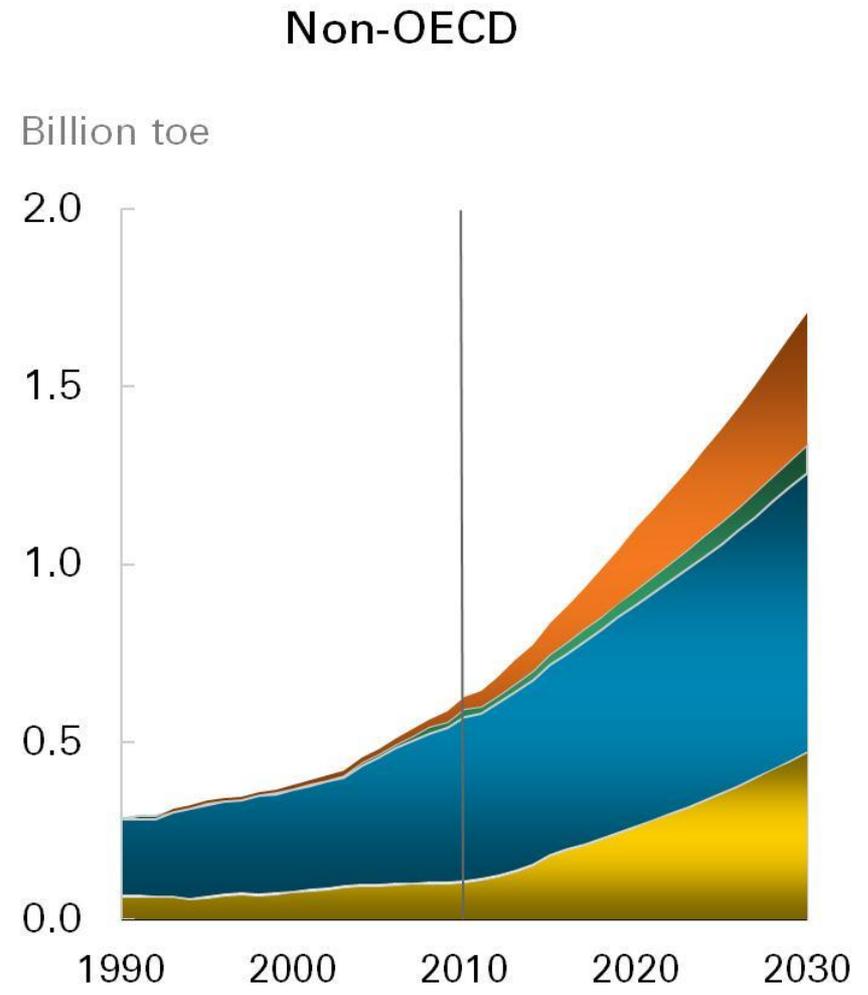
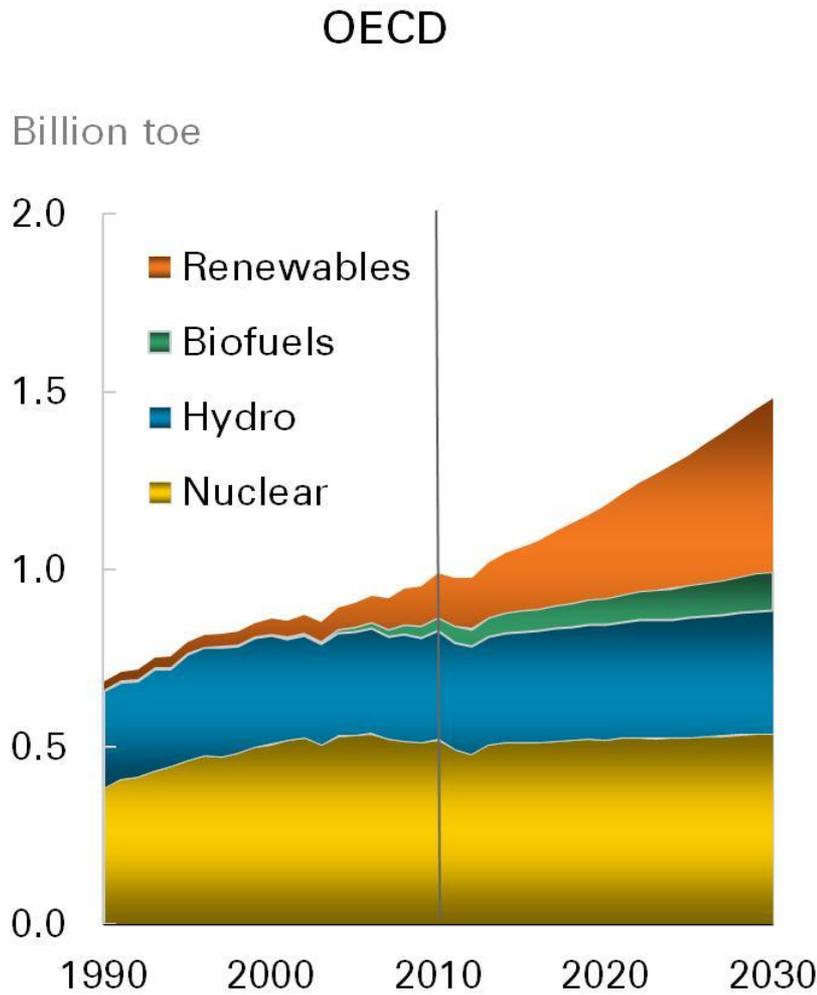
## Coal demand by region



## Coal demand by sector



# Non-fossil fuels growth is led by renewables in the OECD



# Outline

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Global energy trends

Outlook 2030: Fuel by fuel

**Key determinants**

**China and India**

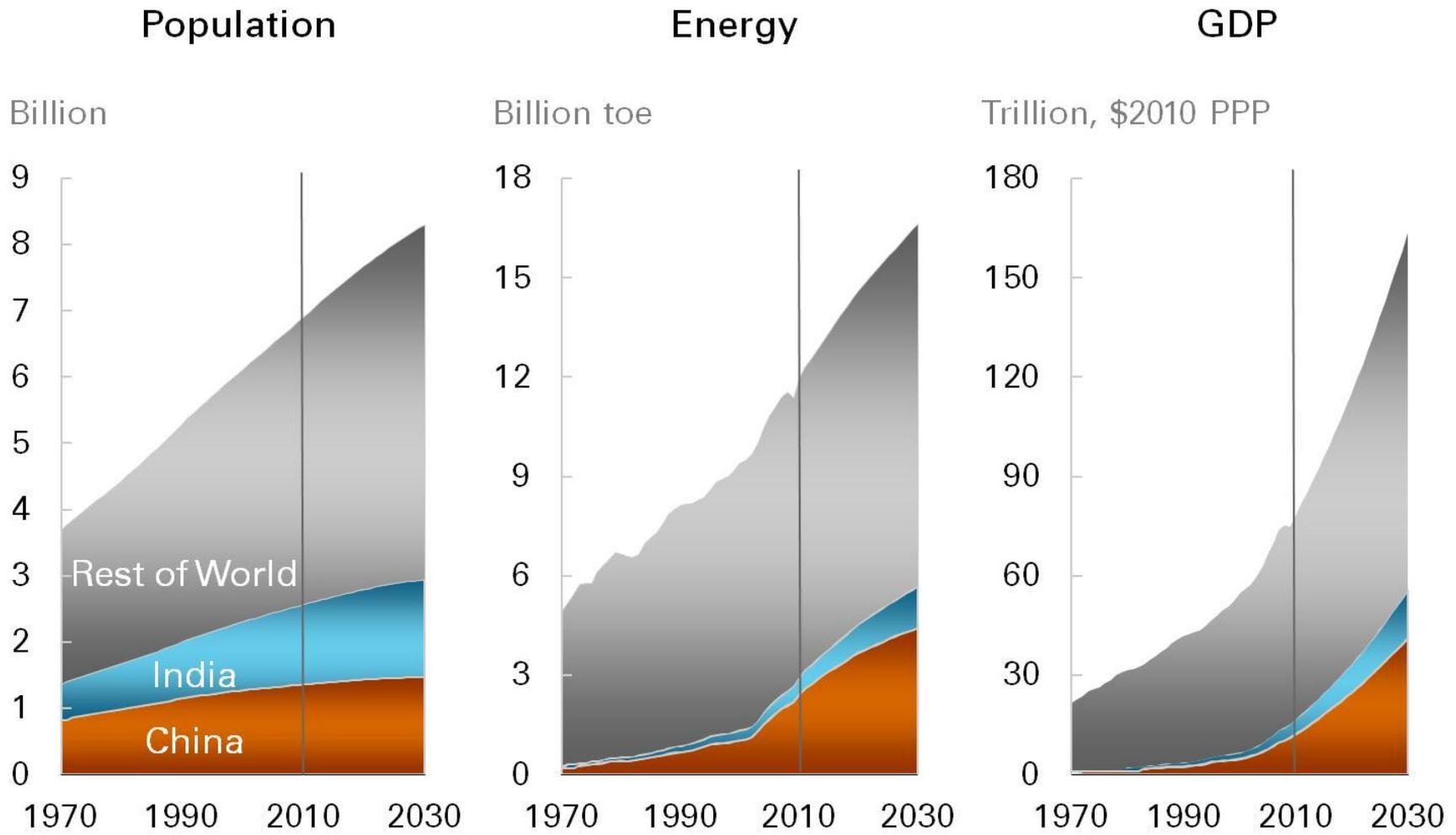
Middle East

Transport

Risks and unknowns



# Pace and scale of development in India and China

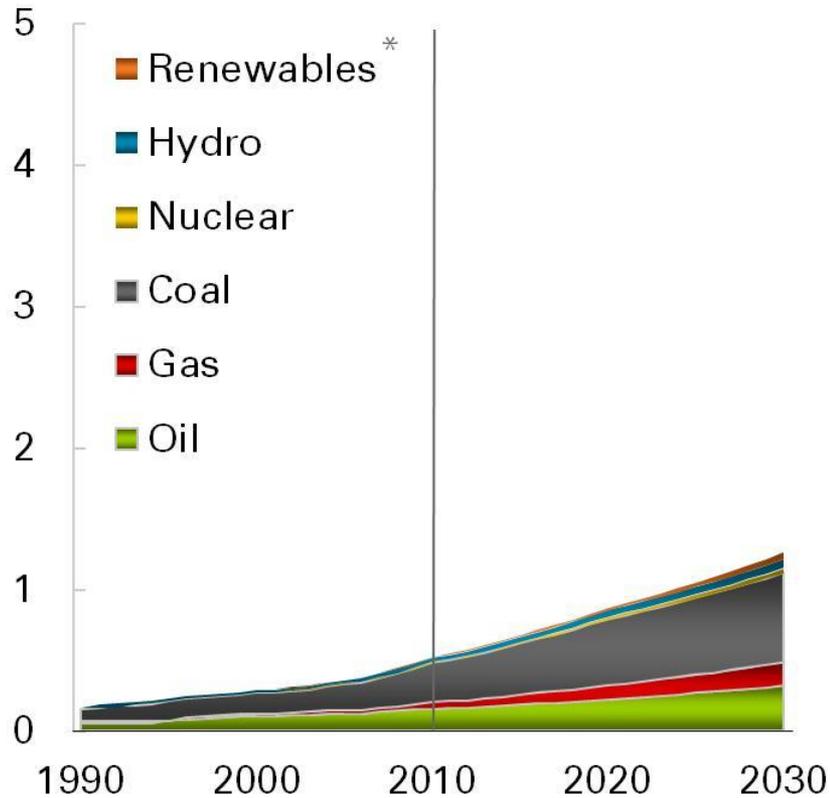




# Energy consumption growth in India and China

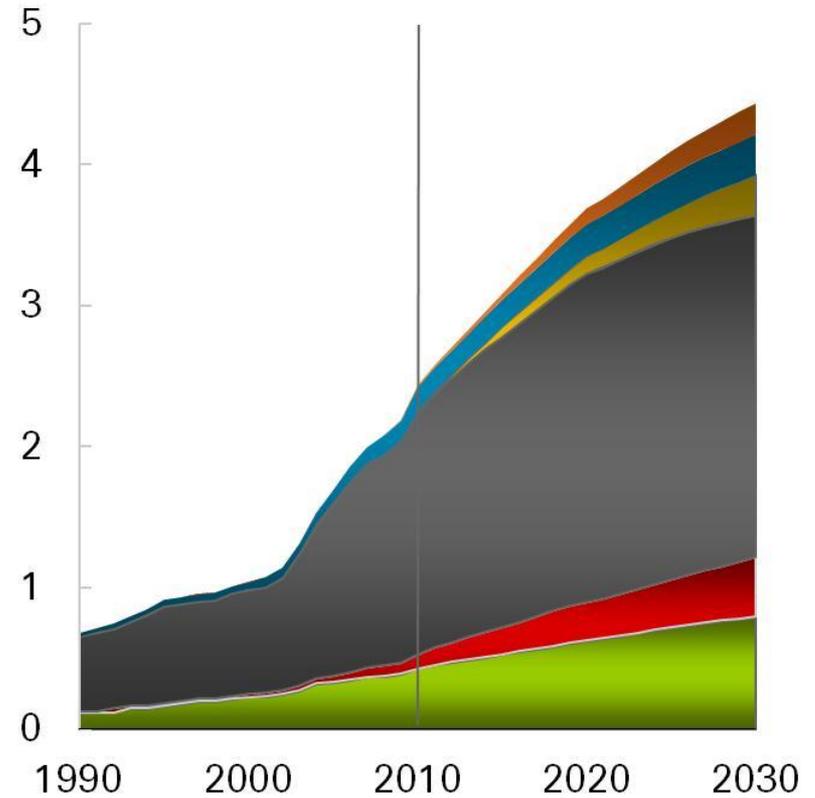
## India

Billion toe



## China

Billion toe

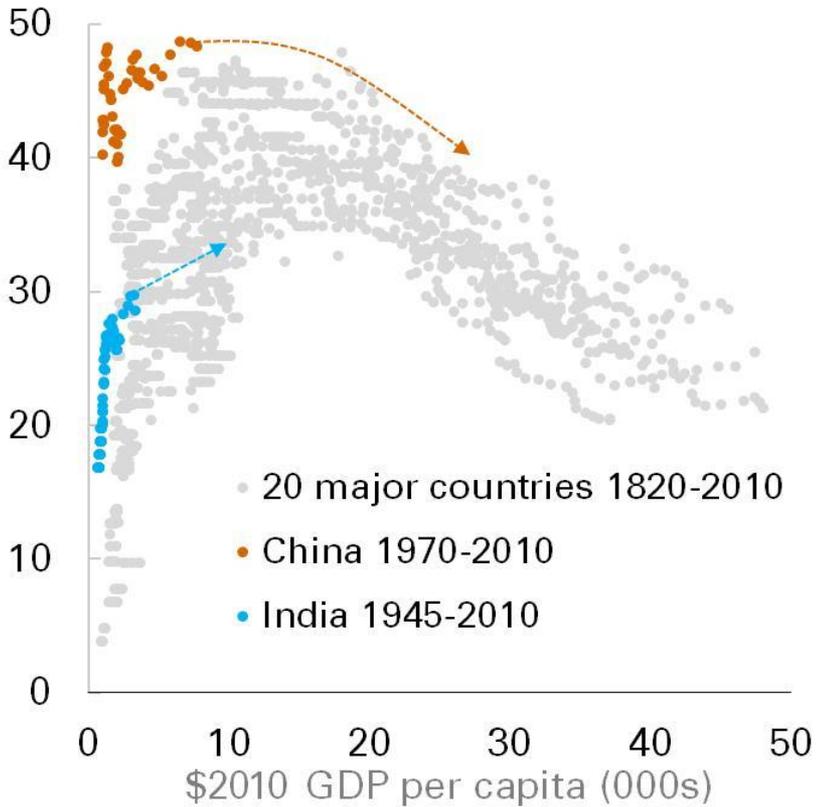


\*Includes biofuels

# Patterns of development

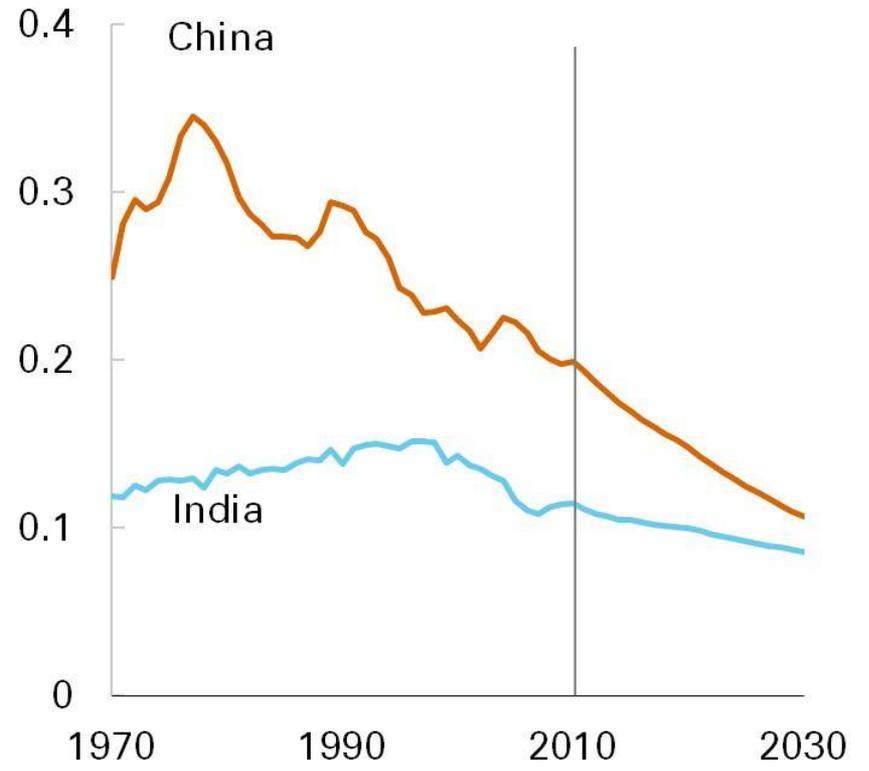
## Industrialisation

Industry as %GDP



## Energy intensity

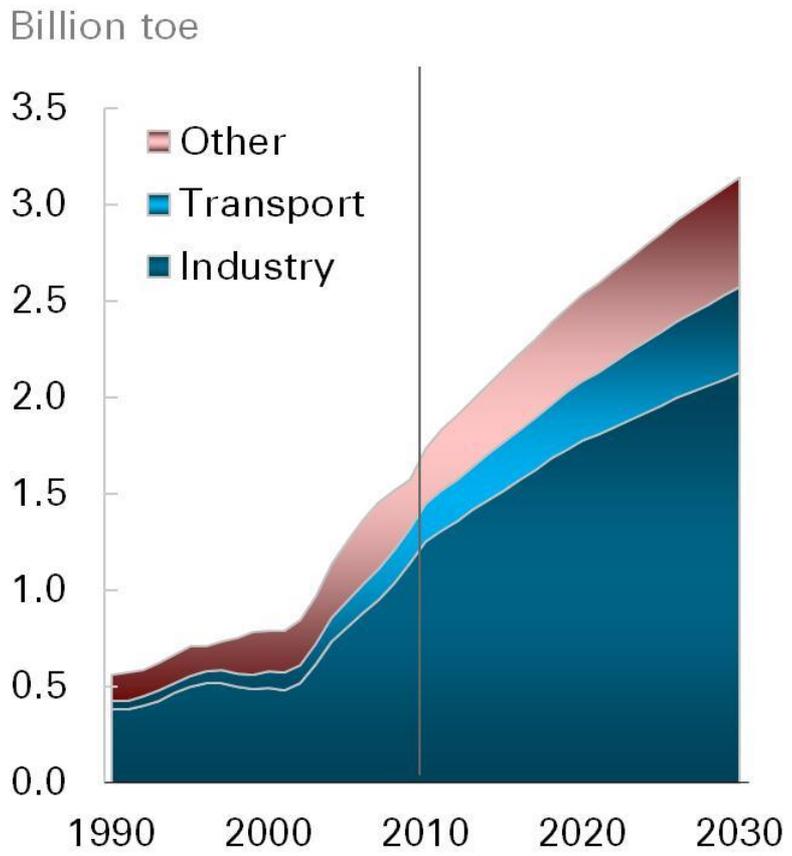
Toe per thousand \$2010 GDP



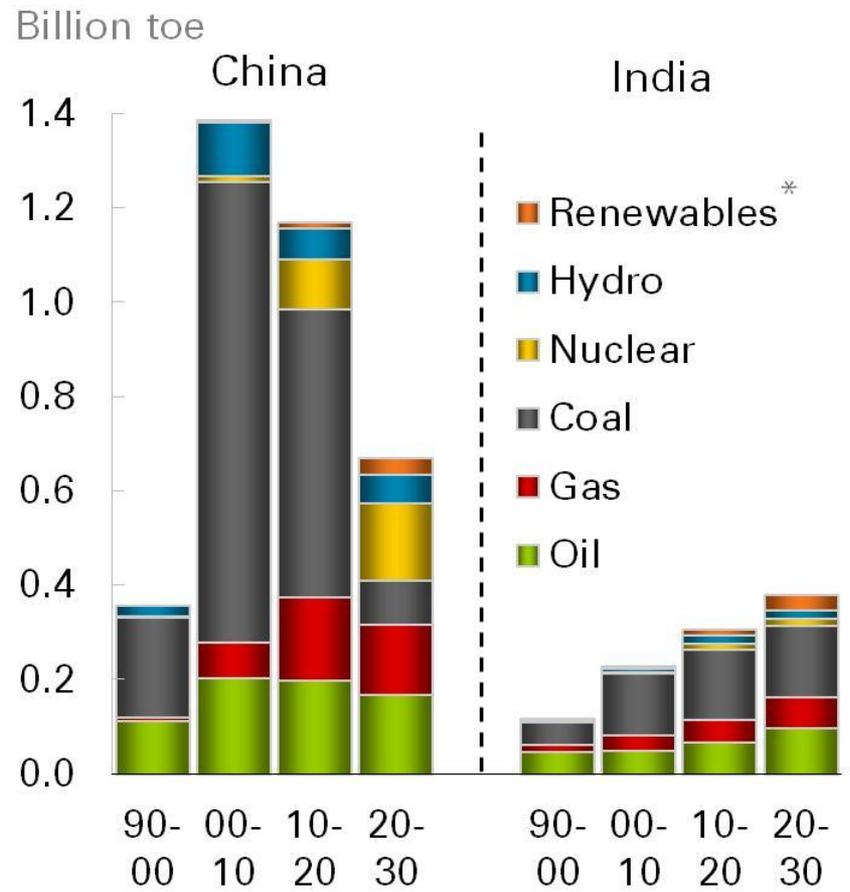


# Industry causes energy demand to decelerate

## China: final energy demand by sector



## Primary energy growth by fuel



\*Includes biofuels



# Outline

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Key determinants

China and India

**Middle East**

Transport

Risks and unknowns



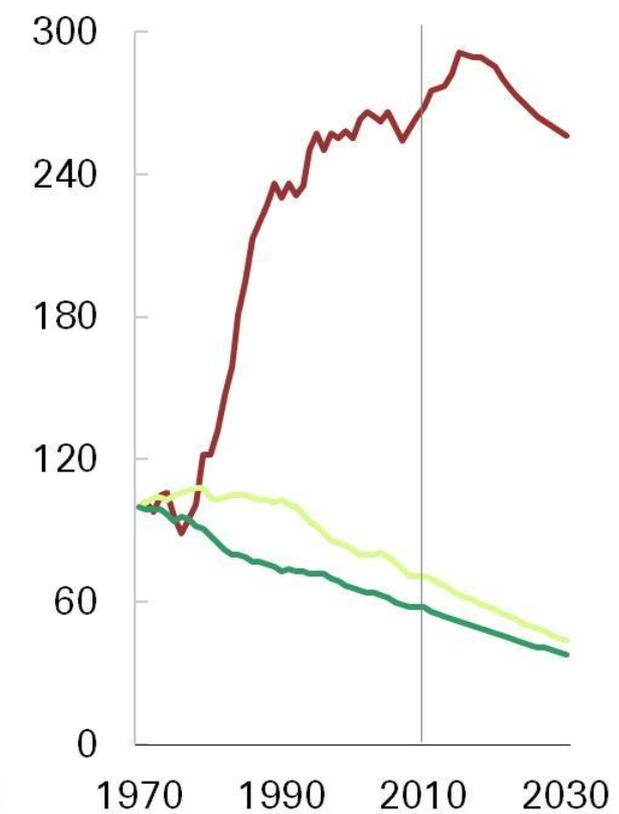
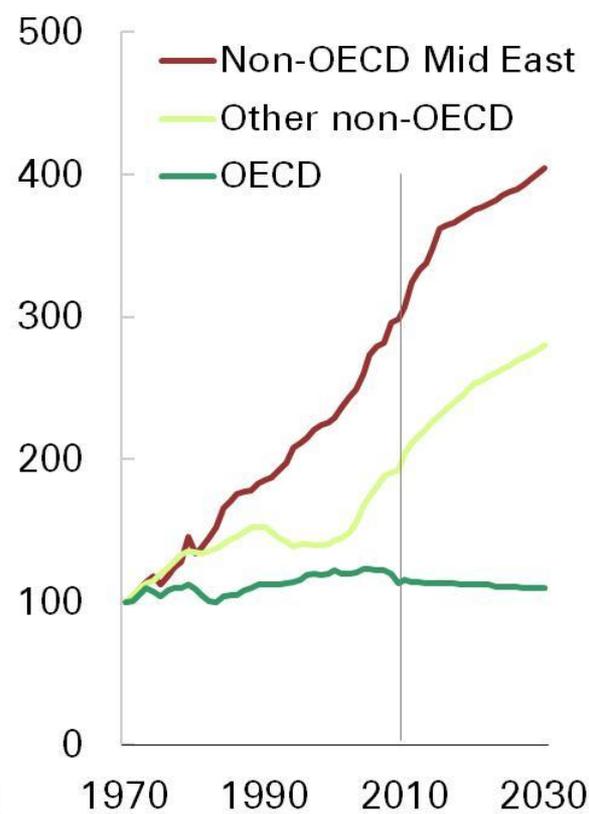
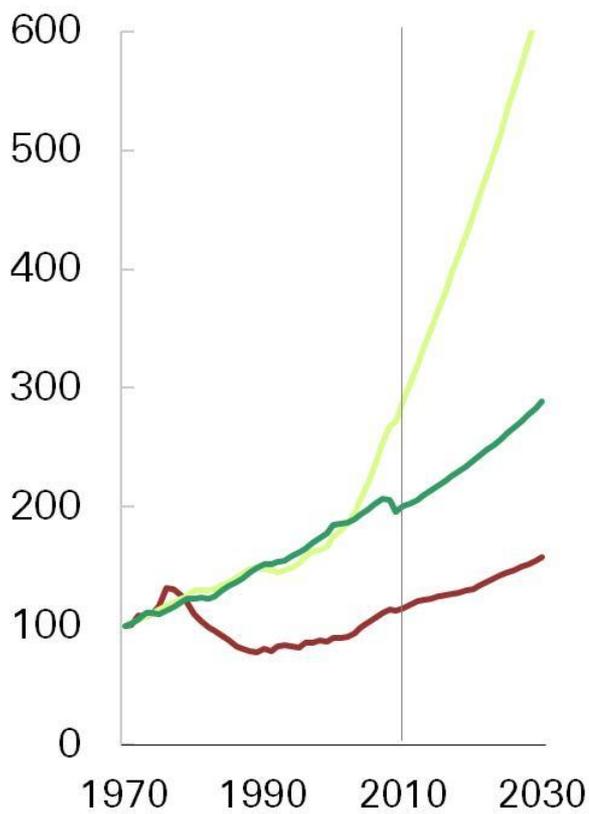
# Resource availability defines the Middle East

### GDP per capita

### Energy per capita

### Energy intensity

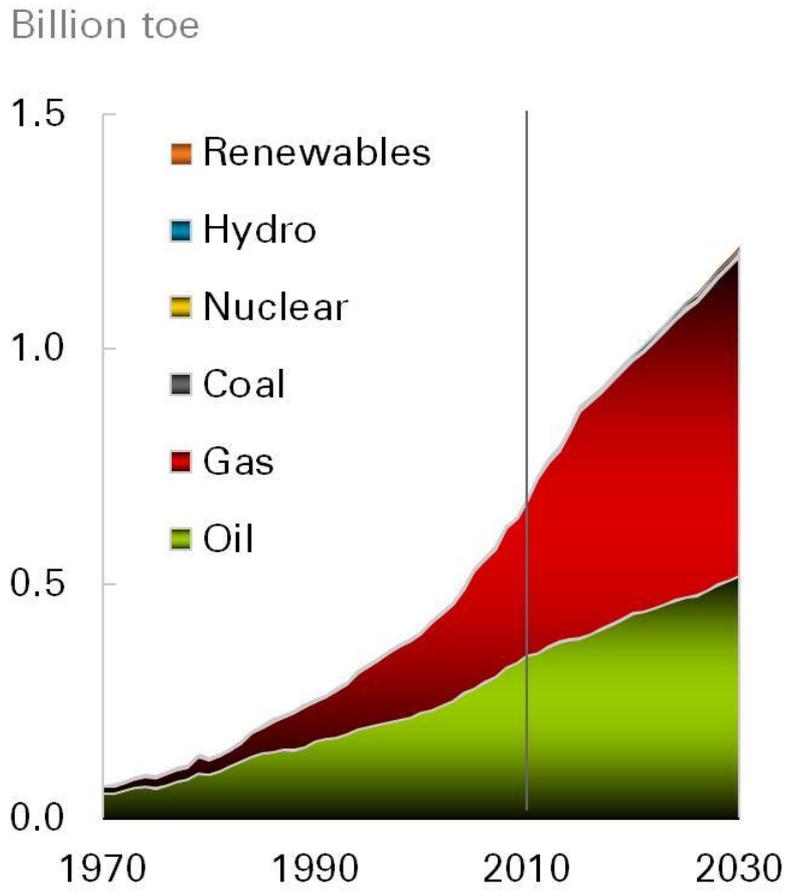
Index (1970=100)



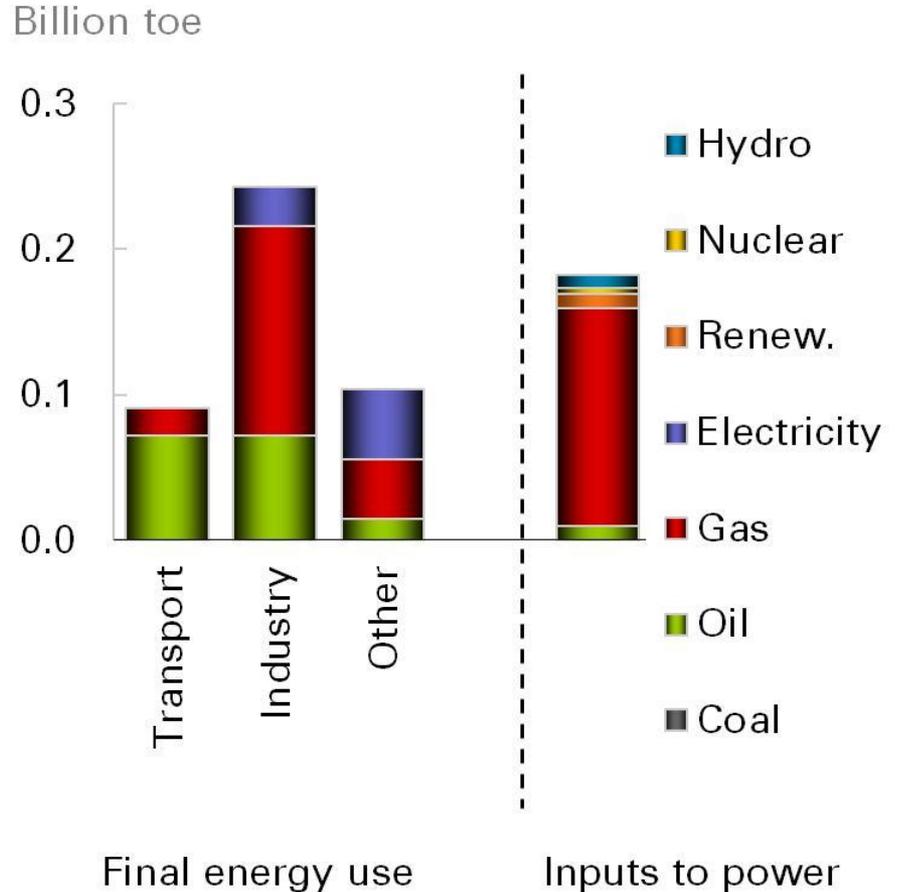


# Gas will play a key role in domestic demand

## Regional demand by fuel



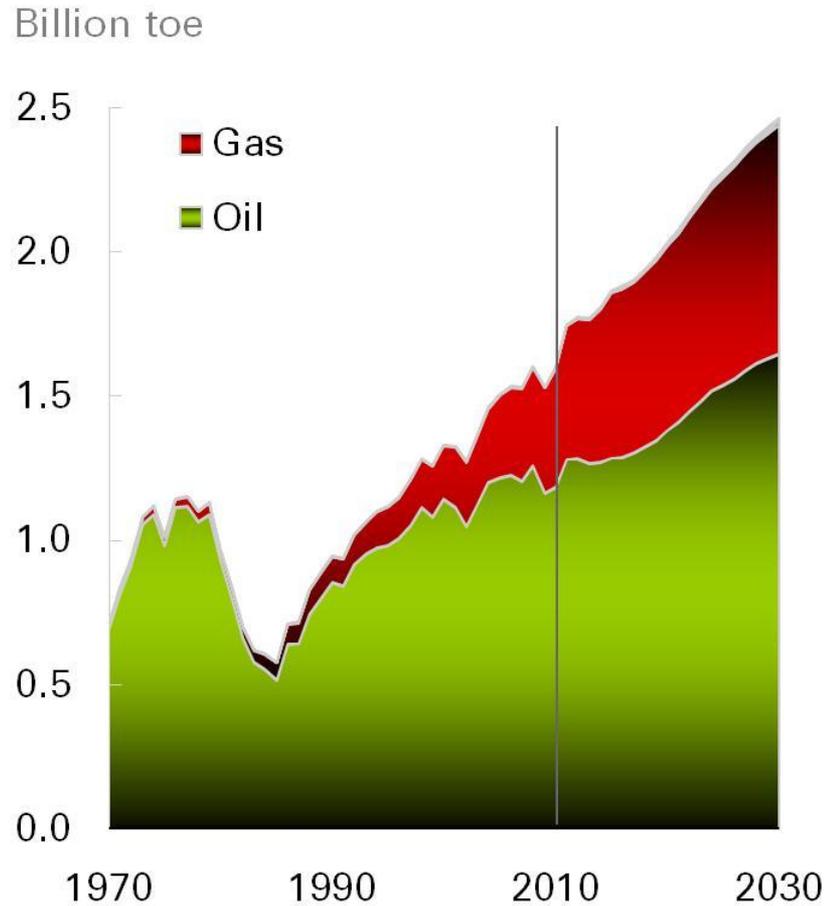
## 2010-30 growth by sector and fuel



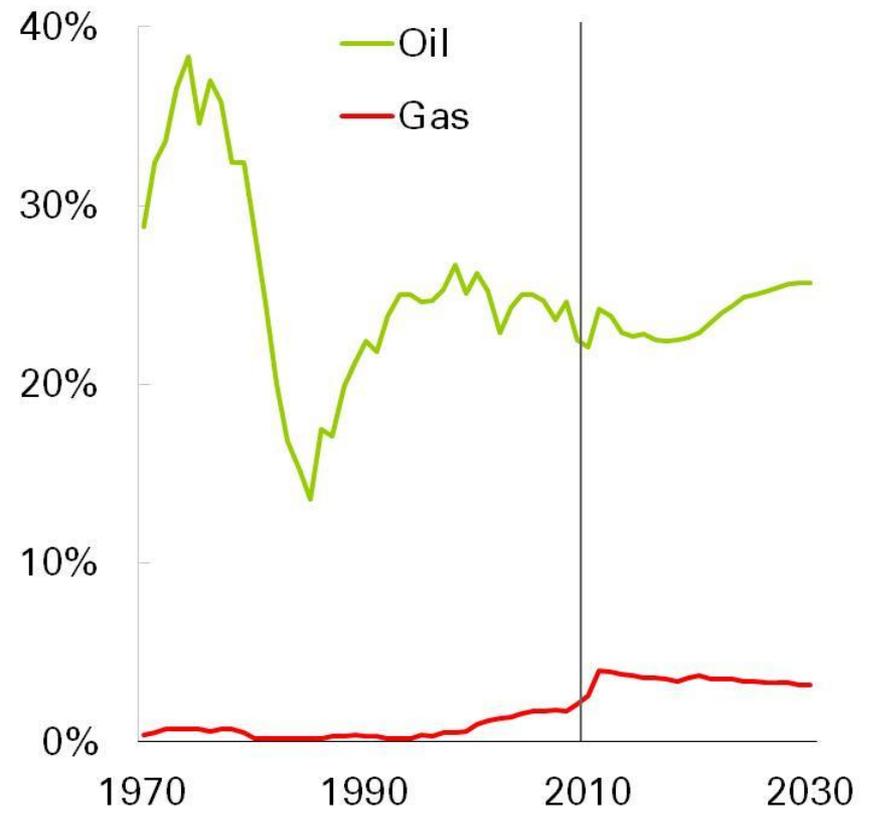


# The region's role in global oil markets will continue

### Supply by fuel



### Exports as share of global demand (excl. Mid East)



# Outline

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Global energy trends

Outlook 2030: Fuel by fuel

Key determinants

- China and India

- Middle East

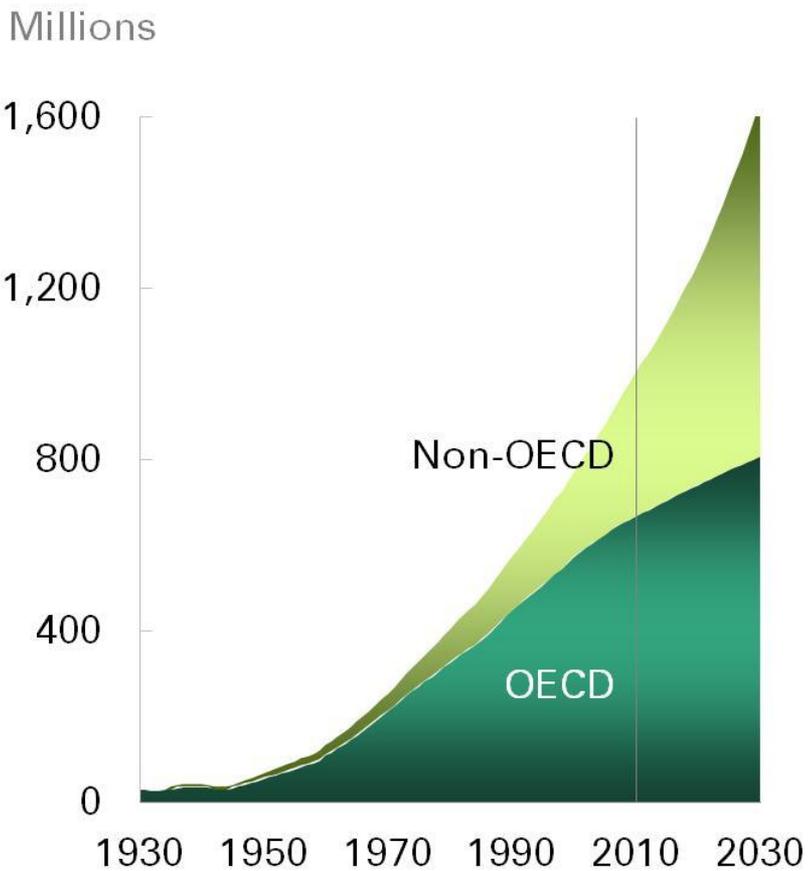
- Transport**

Risks and unknowns

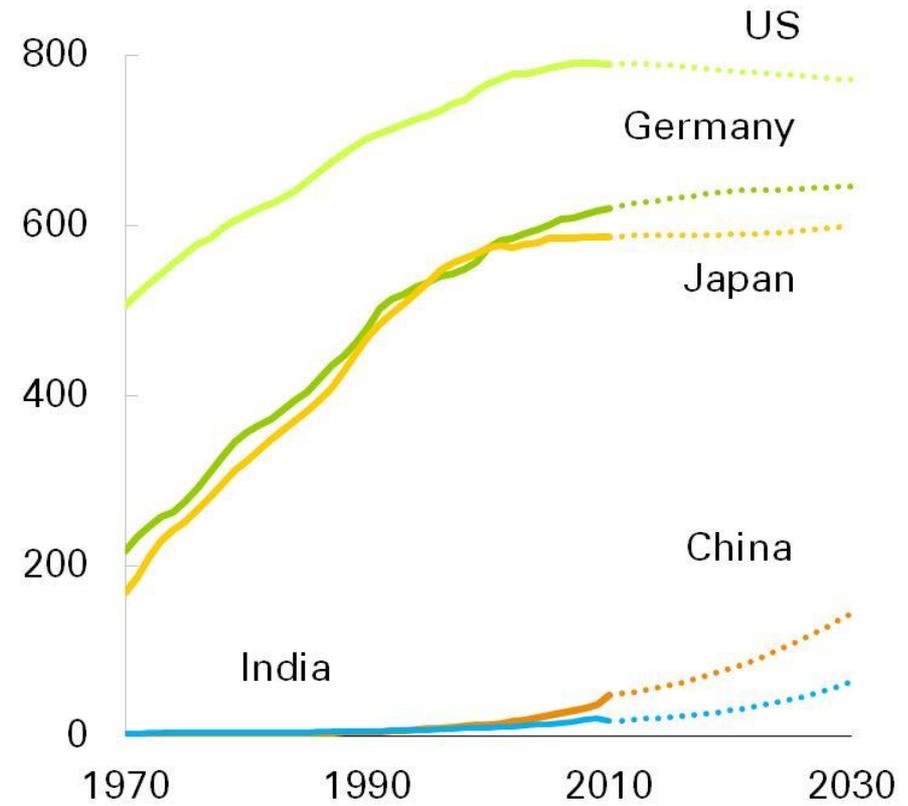


# Vehicle numbers are set to grow rapidly in the Non-OECD

### Total number of vehicles

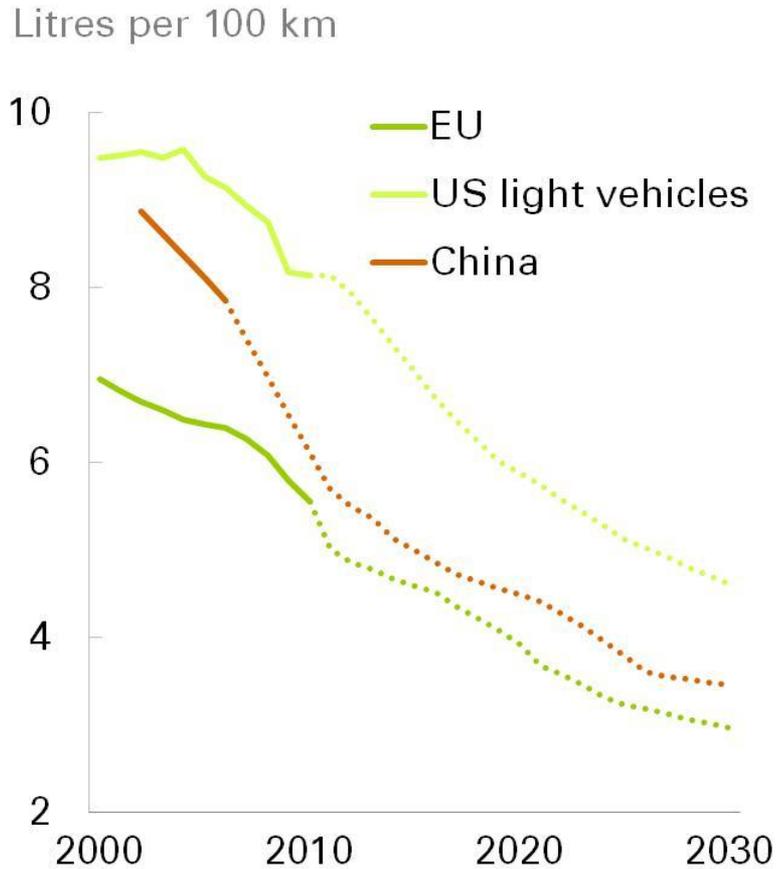


### Vehicles per thousand people

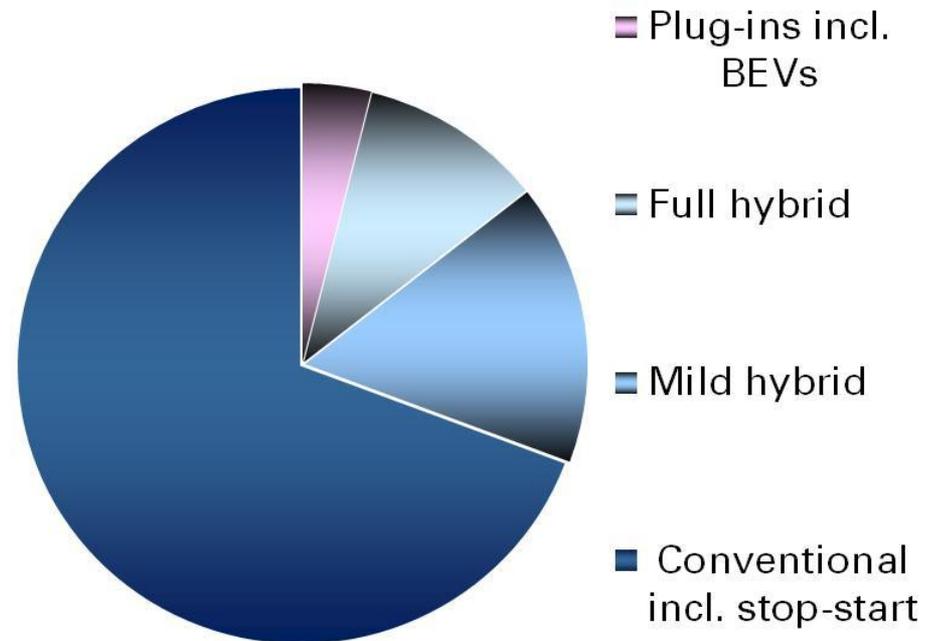


# Policy and technology enable efficiency improvements

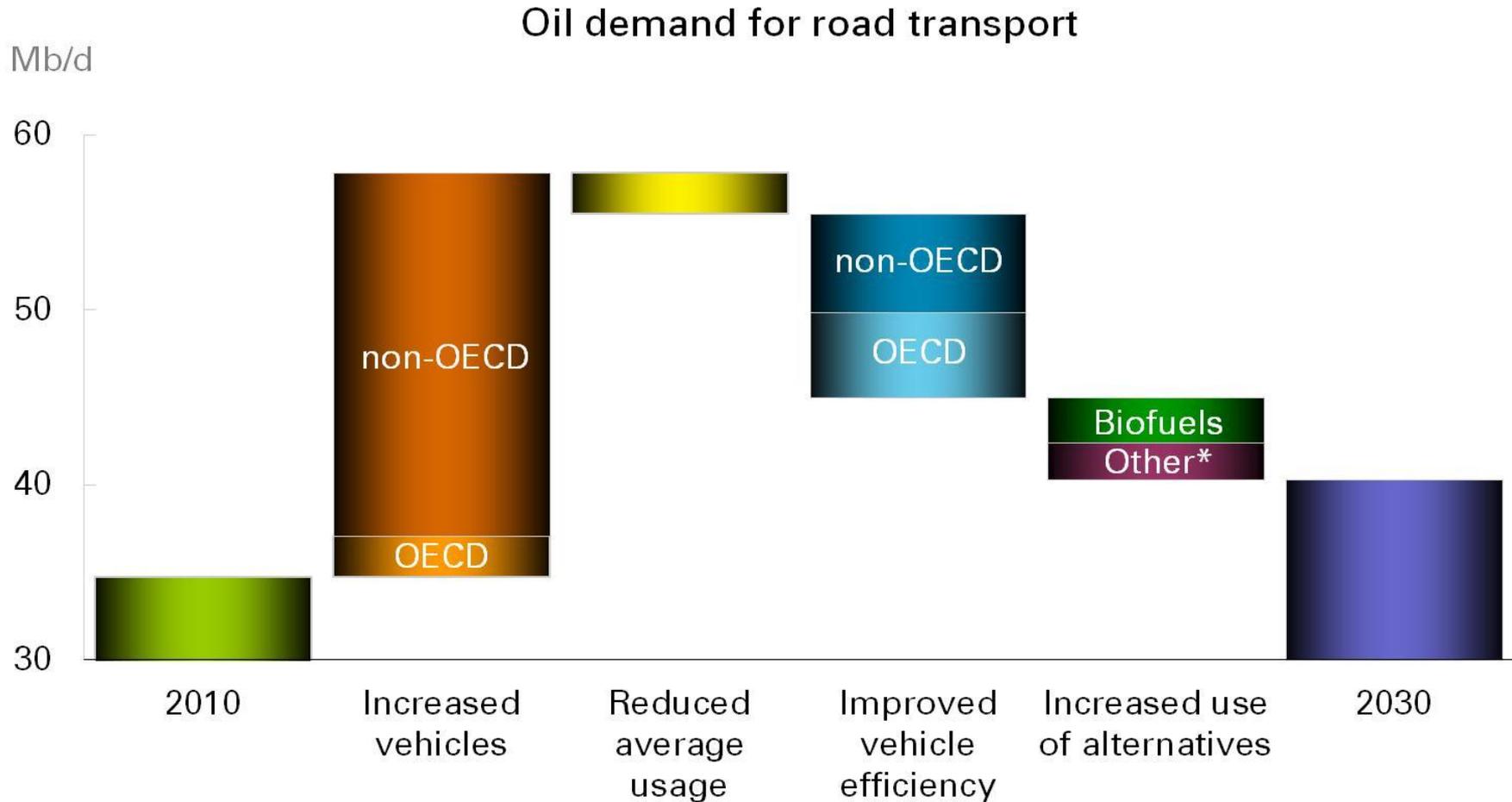
## Projected car efficiency



## Global vehicle fleet in 2030



# Efficiency gains have the biggest impact on oil demand



\* Includes GTL, CTL, CNG, LNG and electricity

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Key determinants

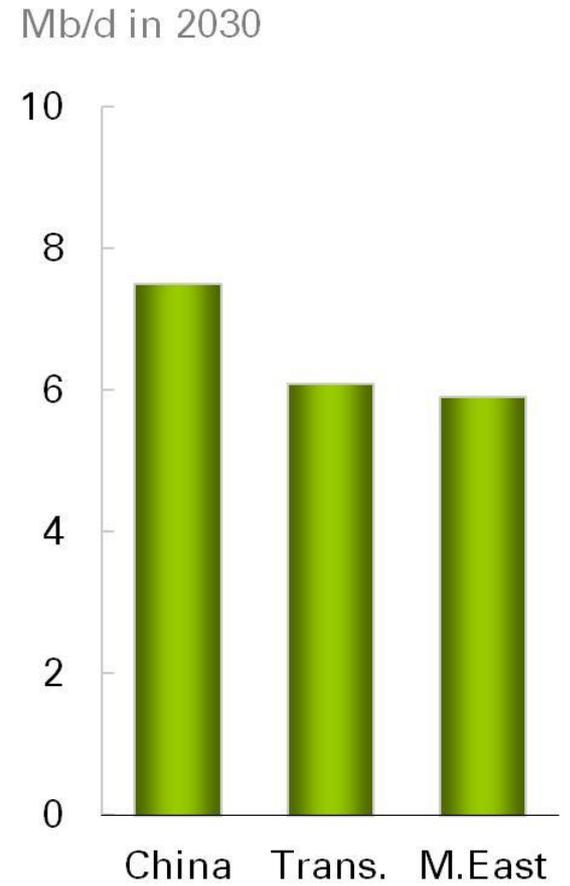
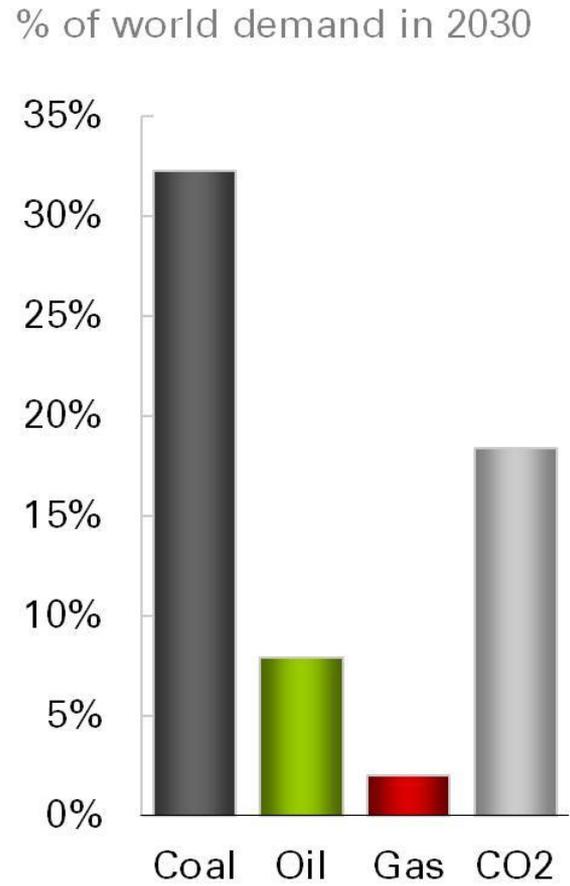
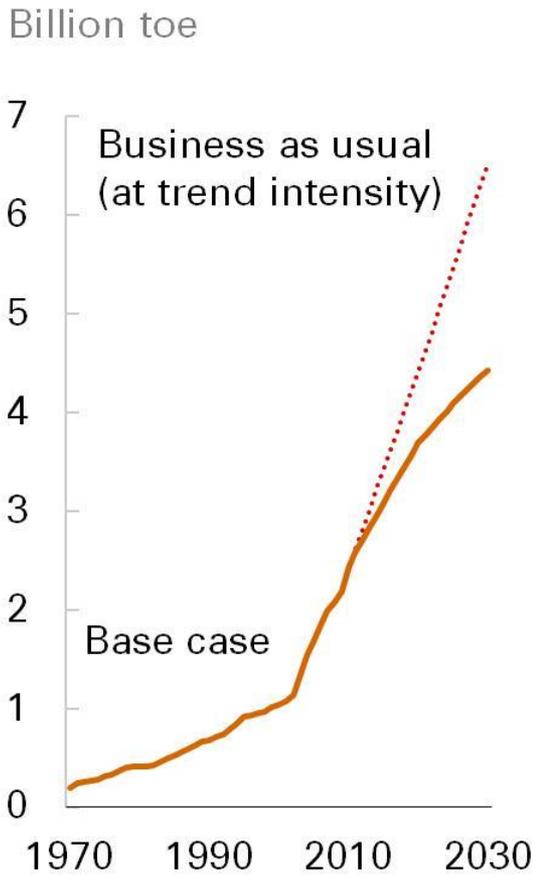
**Risks and unknowns**



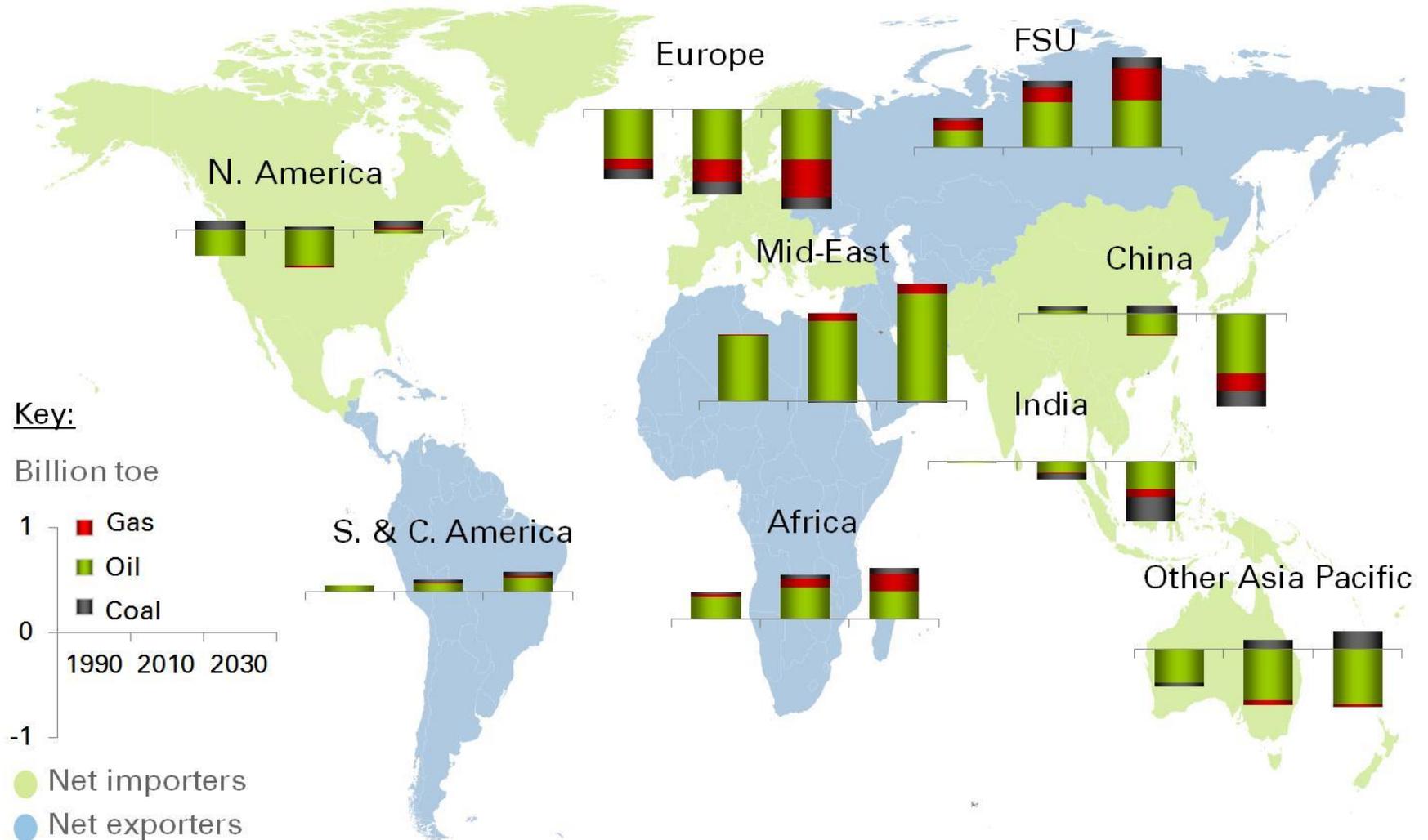
# The impact of "business as usual"

...for China, and its global fuel impact

...and in oil markets

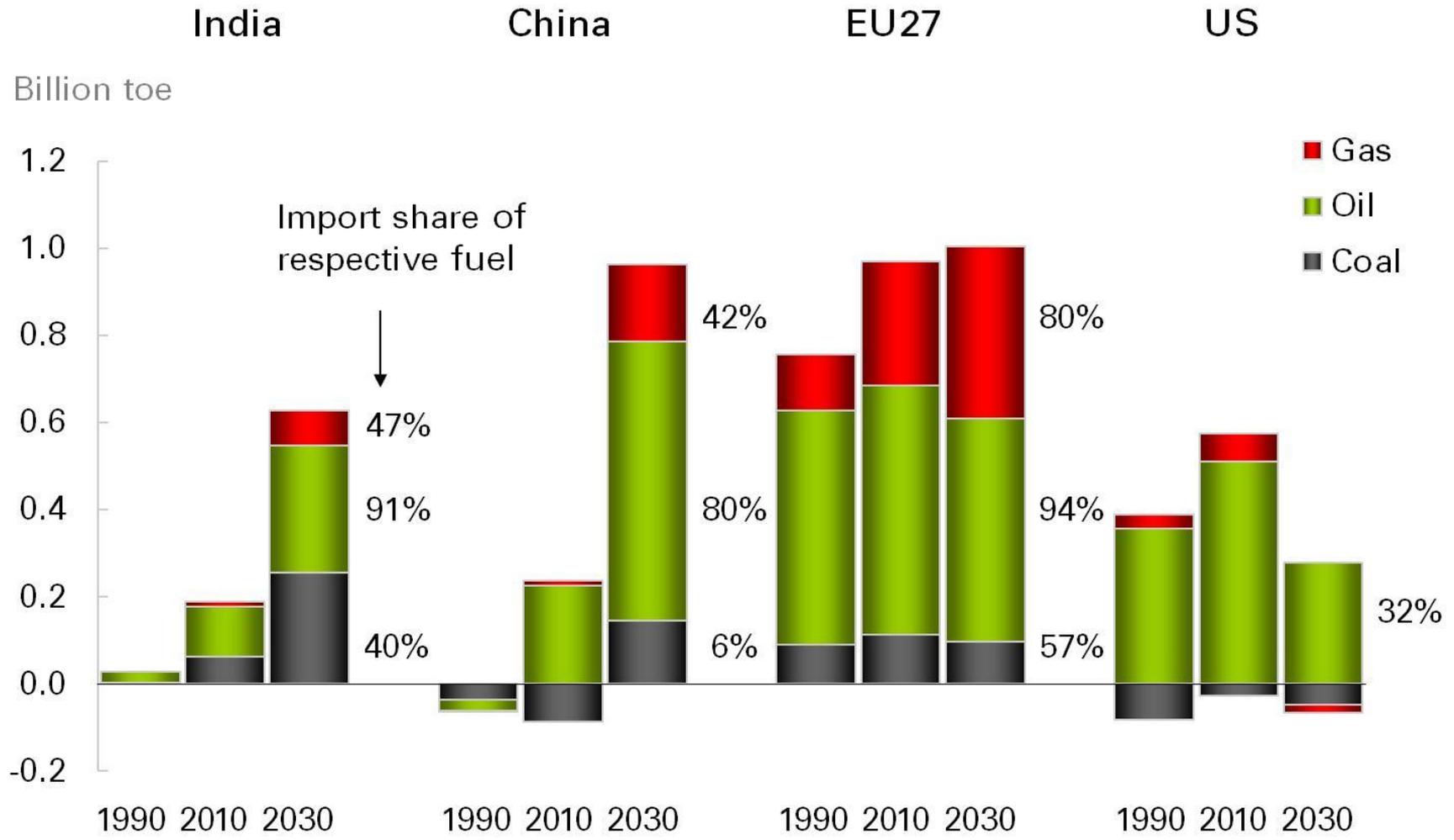


# Energy imbalances improve in the Americas





# Import dependency rises in Asia and Europe

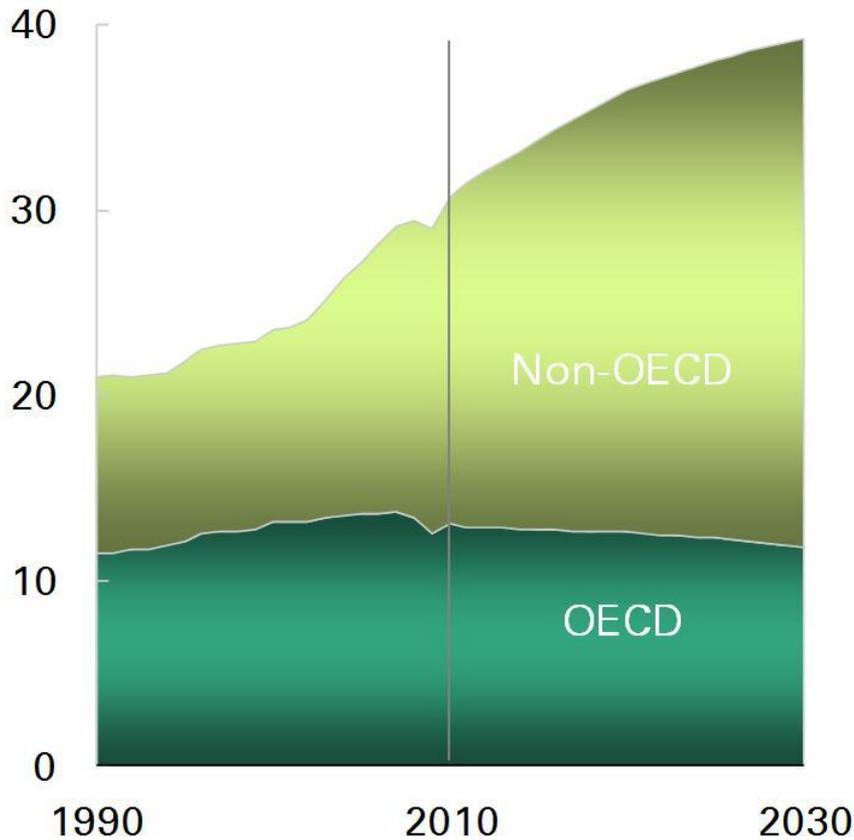




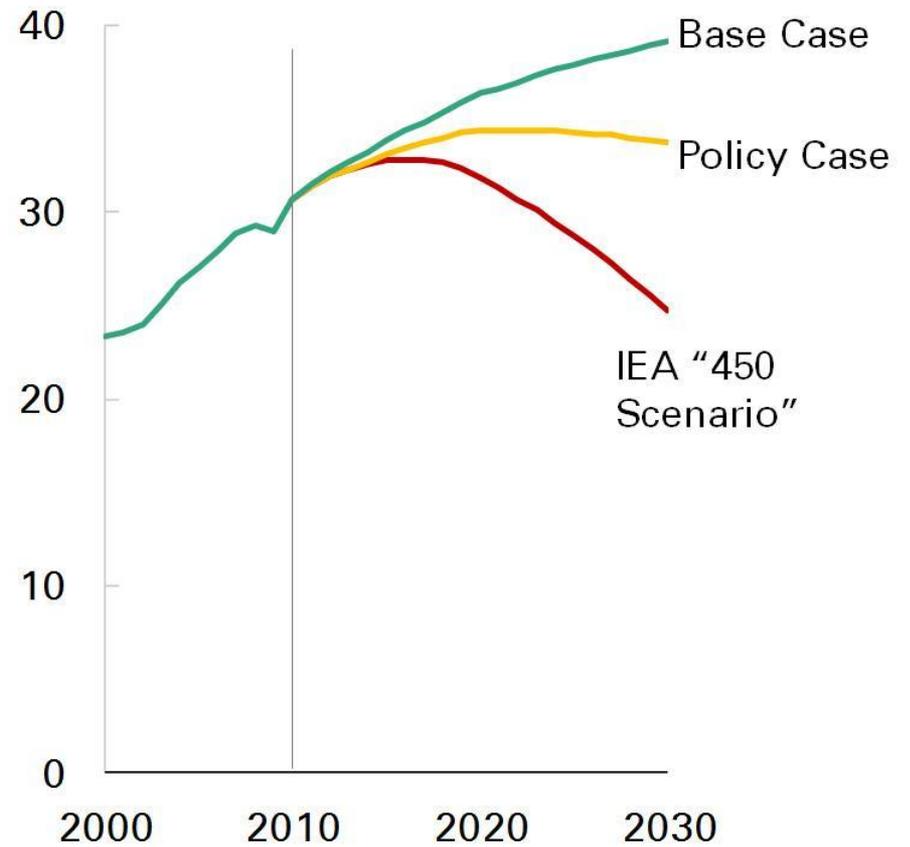
# Carbon emission growth slows, but more action is needed

## Global CO<sub>2</sub> emissions from energy use

Billion tonnes CO<sub>2</sub>

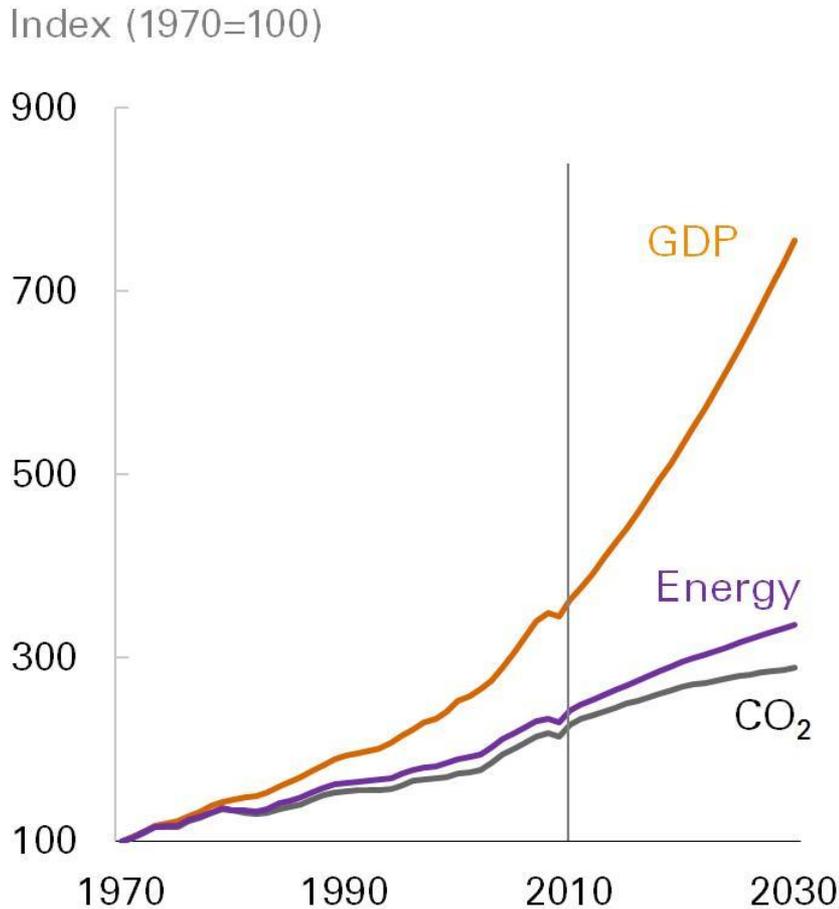


Billion tonnes CO<sub>2</sub>



# Conclusion

## GDP, Energy and CO<sub>2</sub>



- Energy can be available and affordable
  - Competition
  - Innovation
  - Regulation
- Energy security an issue
- CO<sub>2</sub> emissions not on track



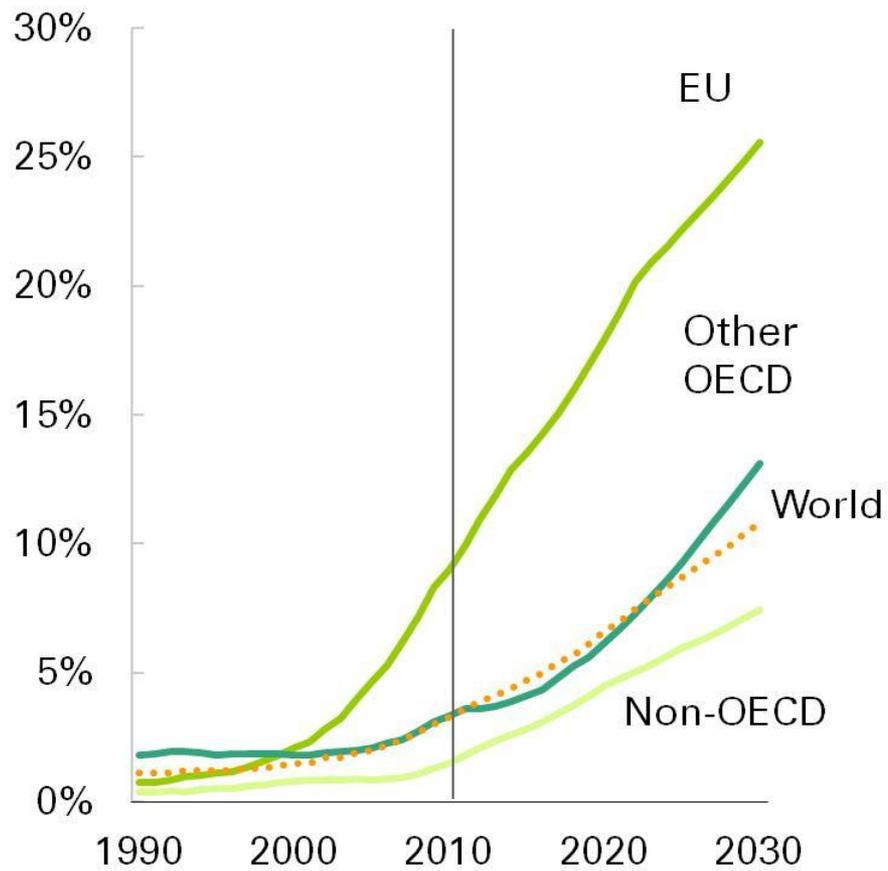
# BP Energy Outlook 2030

<http://www.bp.com/energyoutlook2030>

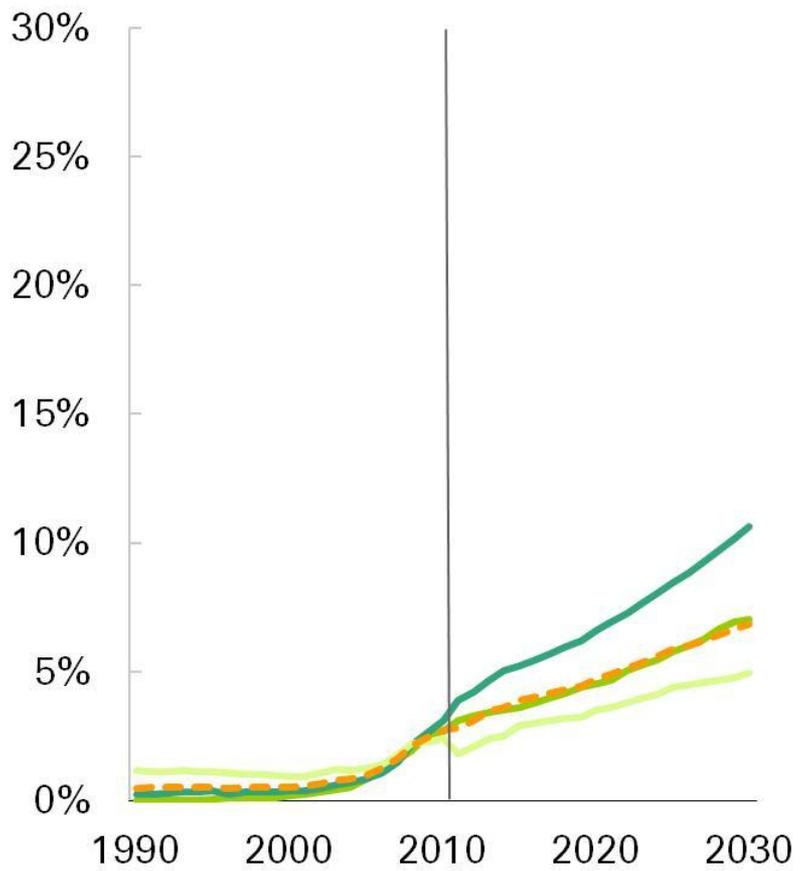


# Renewables increase their share in power and transport

## Share of power generation



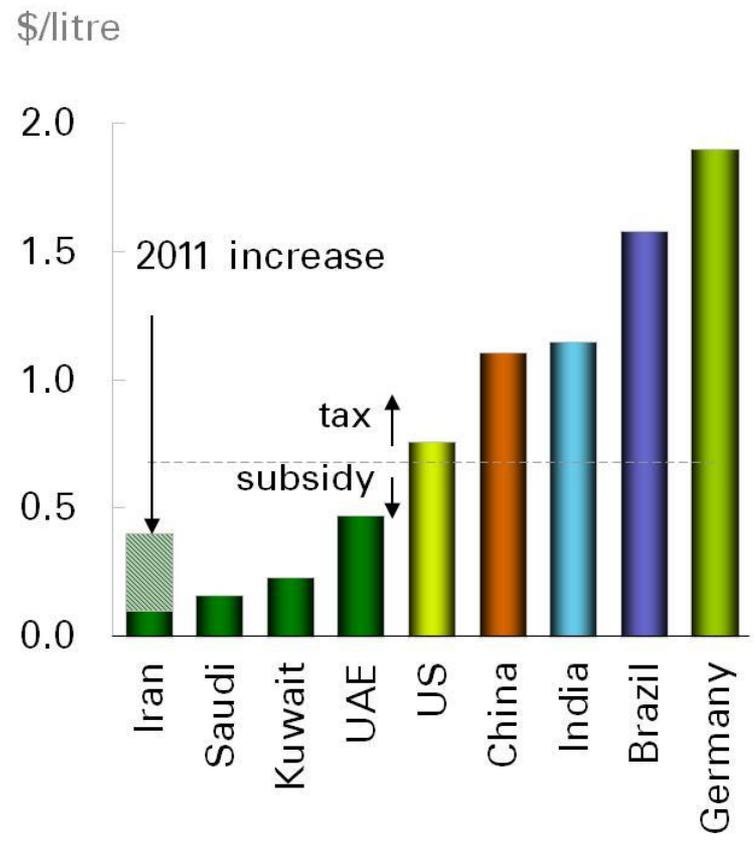
## Share of transport sector



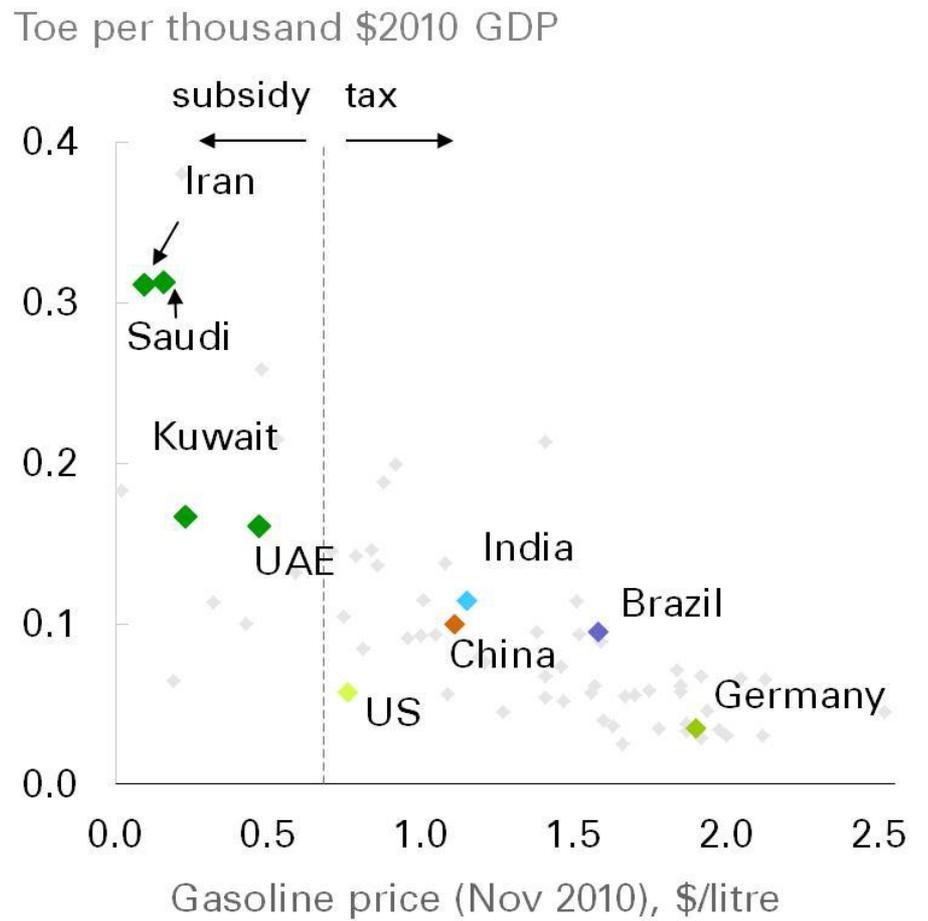


# High subsidies contribute to elevated energy intensity

## Retail gasoline prices (Nov 2010)



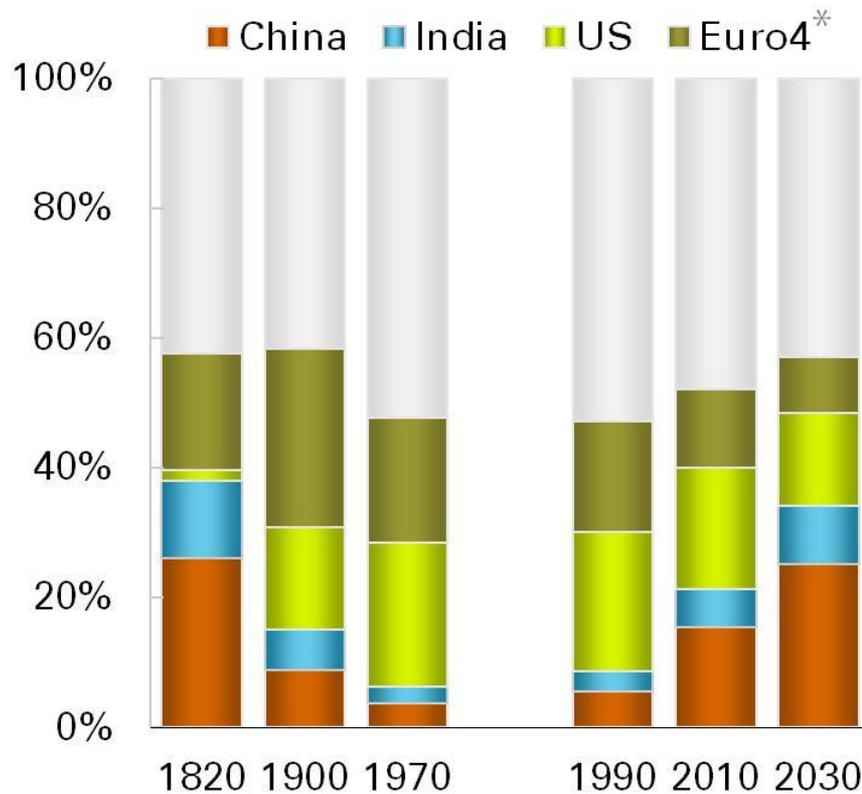
## Oil intensity vs prices



# Long-run trends

## World GDP shares

% of world GDP



\*Includes UK, France, Germany, Italy

## World population shares

% of world population

