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Climate policies, world security and other dimensions of world governance

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Research Director
UK Energy Research Centre

Third Researchers Meeting
International Research Network for Low-Carbon Societies
Paris, October 13th-14th 2011

Re-interpreting the title

Climate policies, world security and other dimensions of world governance

Energy futures, security and trade – implications for climate policy

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Structure of talk

- What's happening in the energy world
- Energy futures: three parallel universes
- Energy security and climate change
- Sustainability and energy-related trade issues: EU policies and actions
- Conclusions

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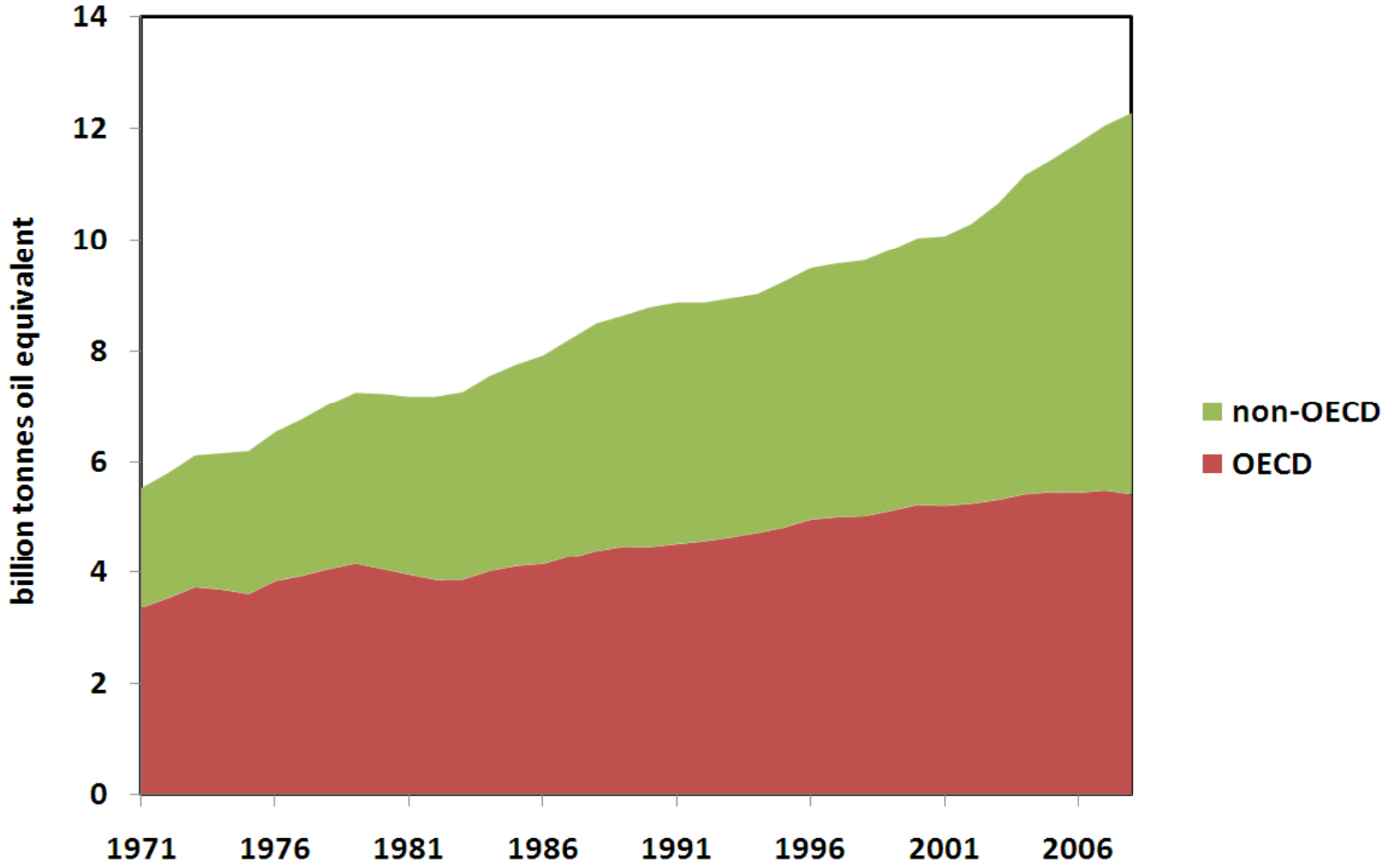
World Primary Energy Demand



Source: IEA

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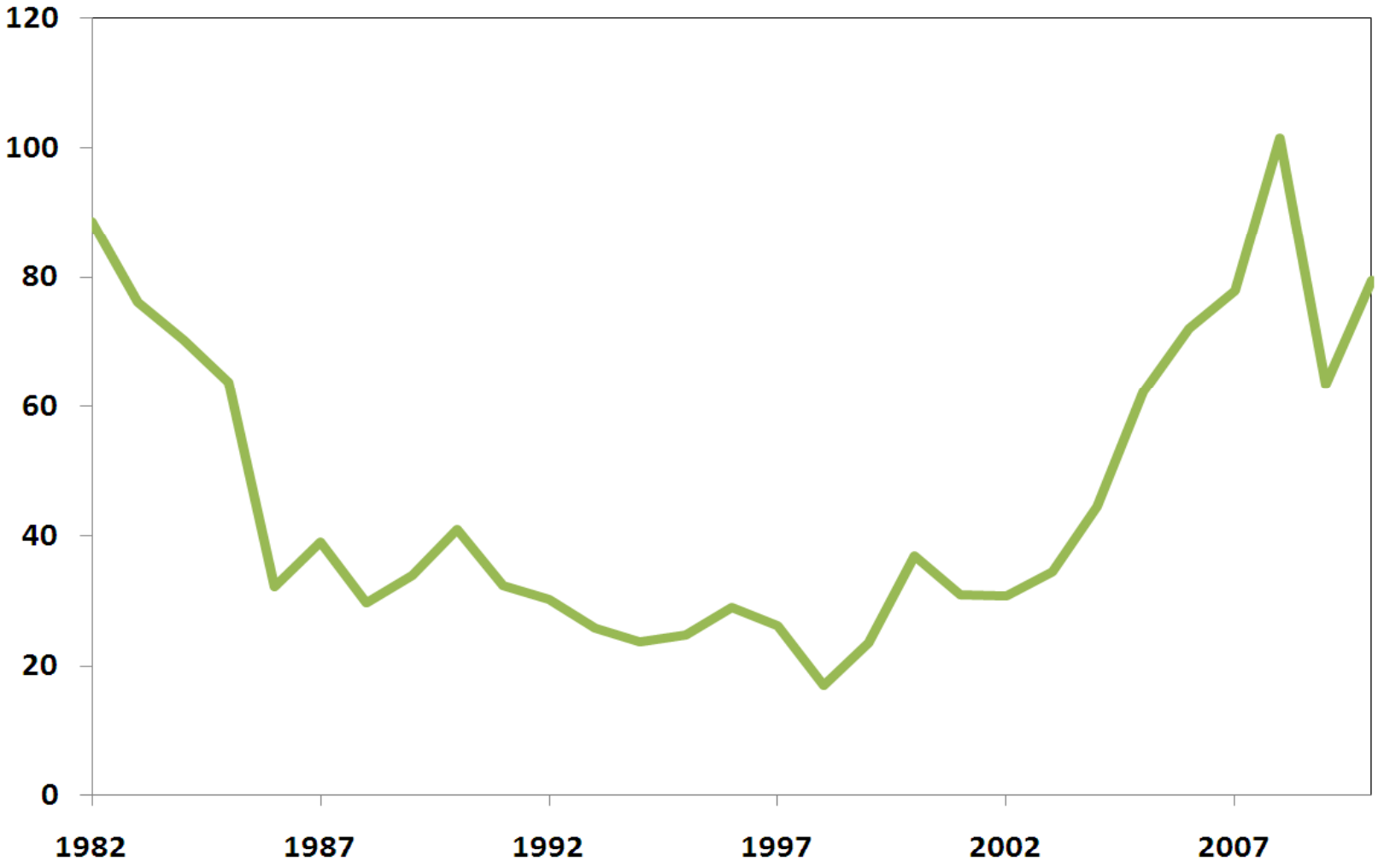
Price of Brent Crude (2010 $/barrel)



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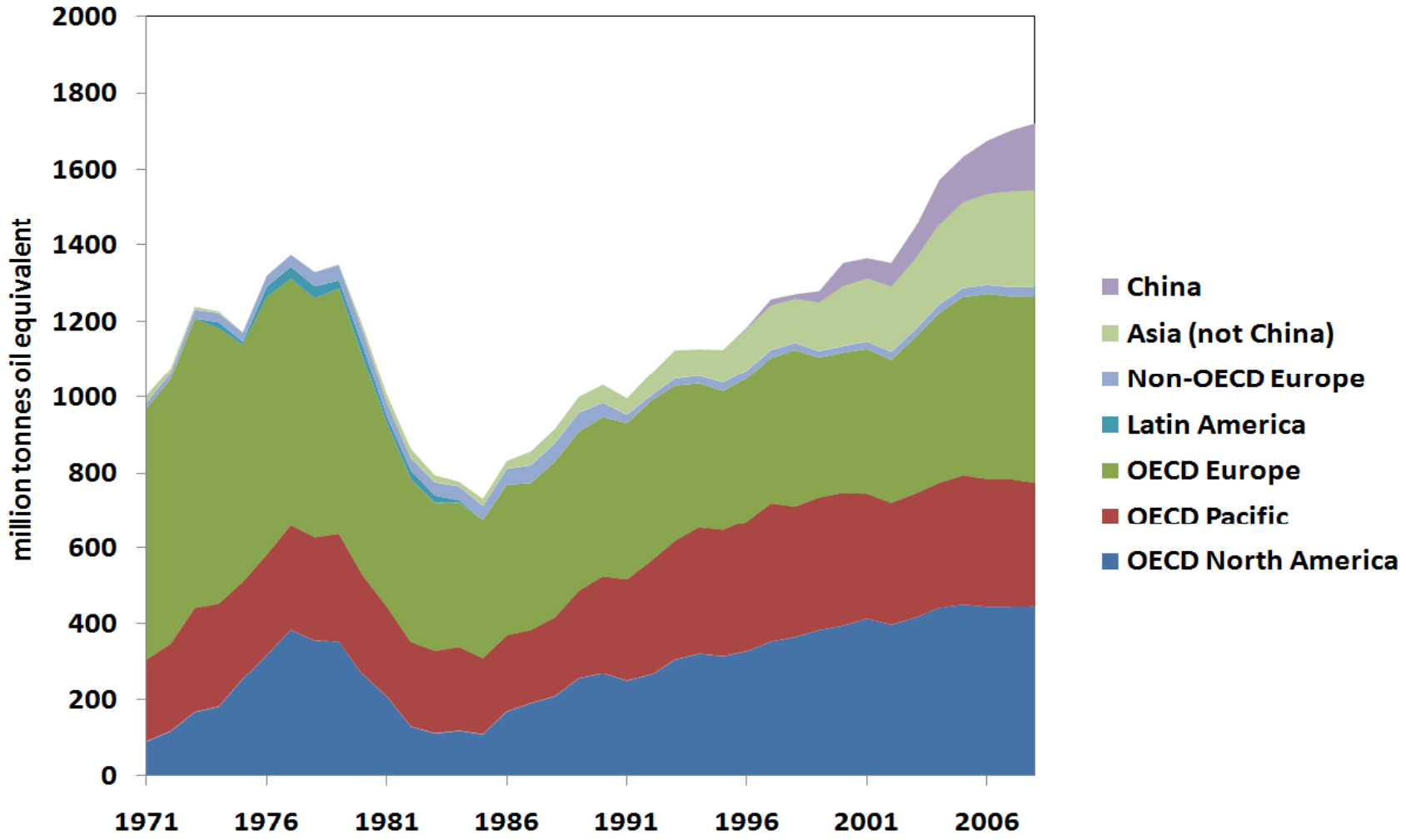
Crude oil imports



Source: IEA

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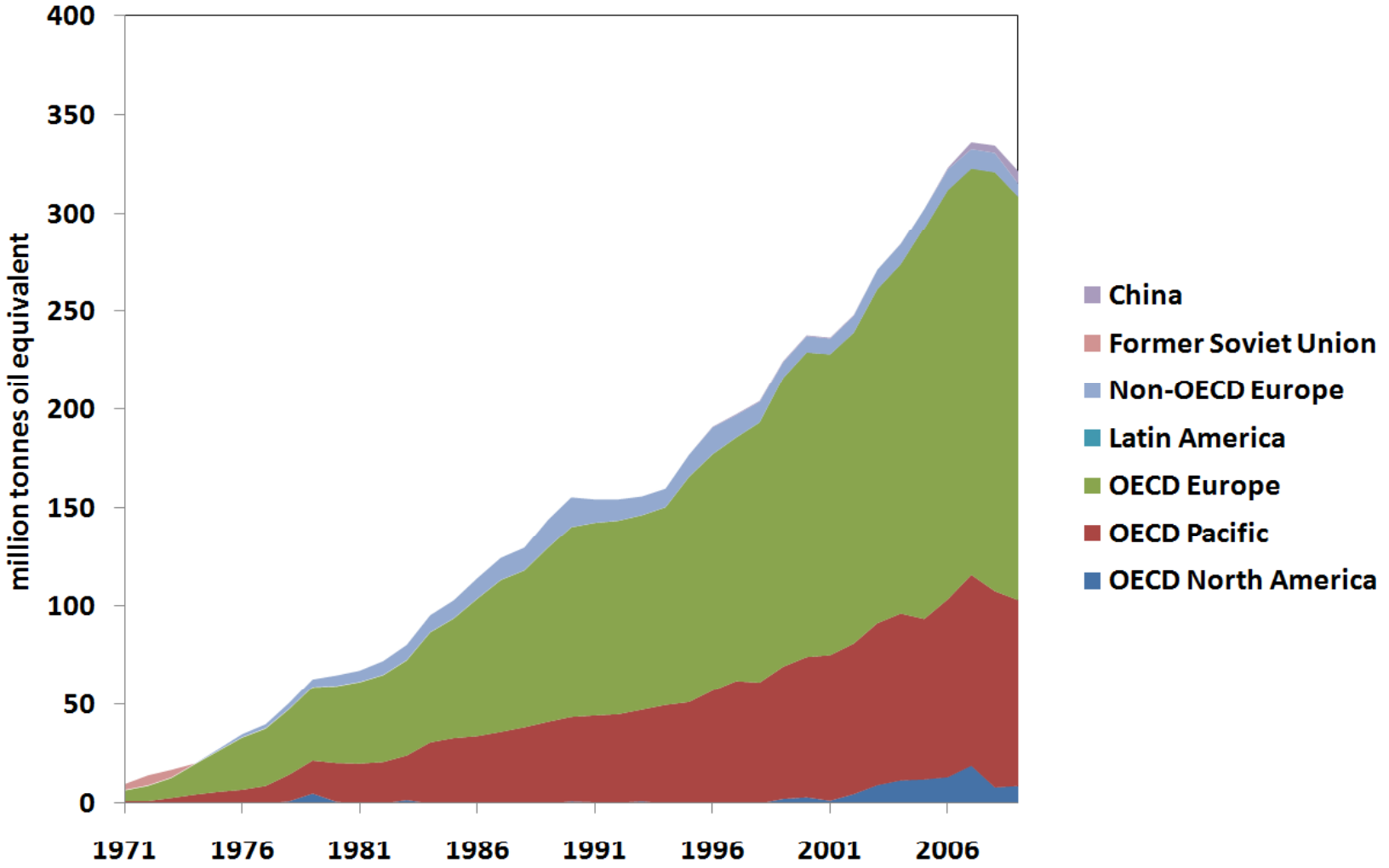
Natural gas imports



Source: IEA

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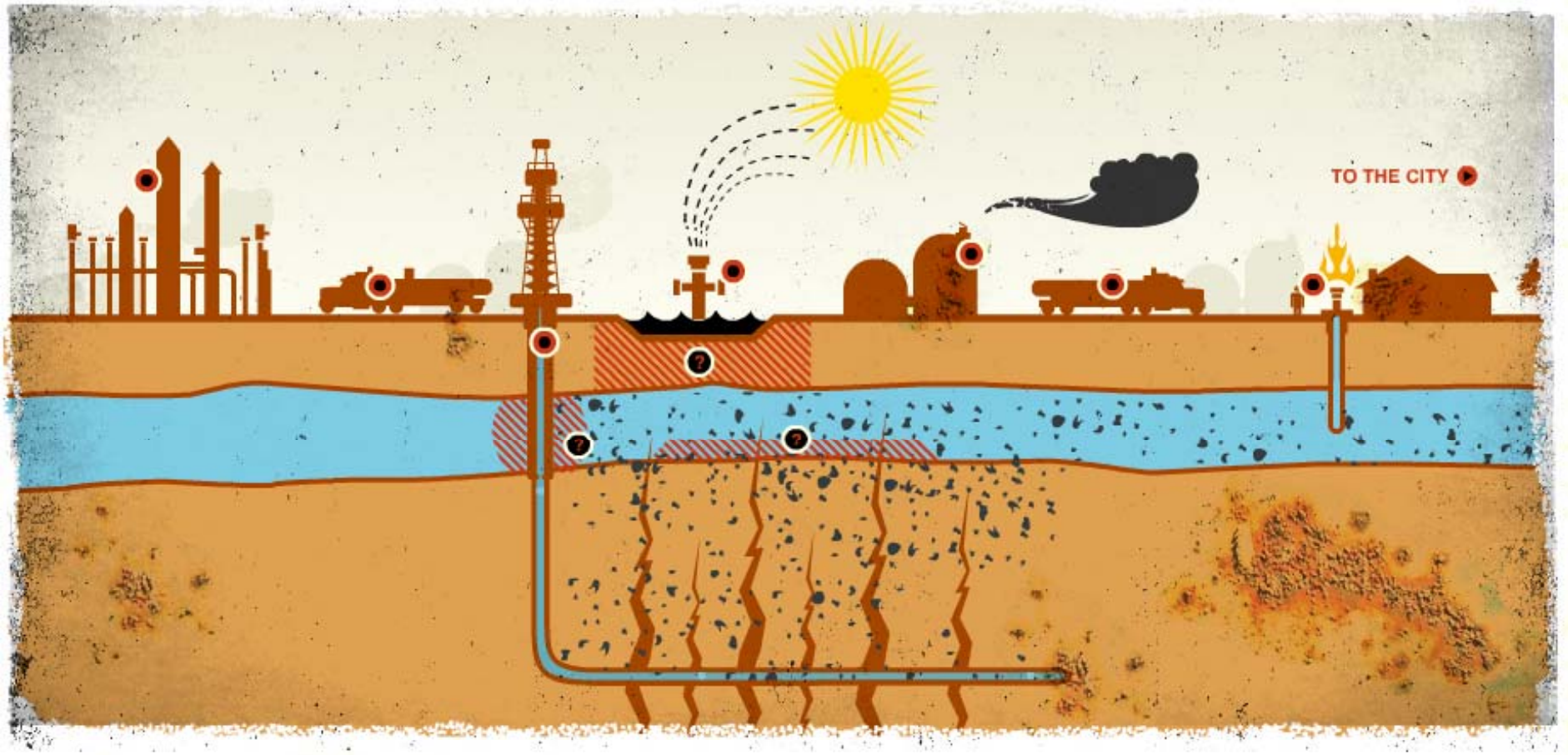
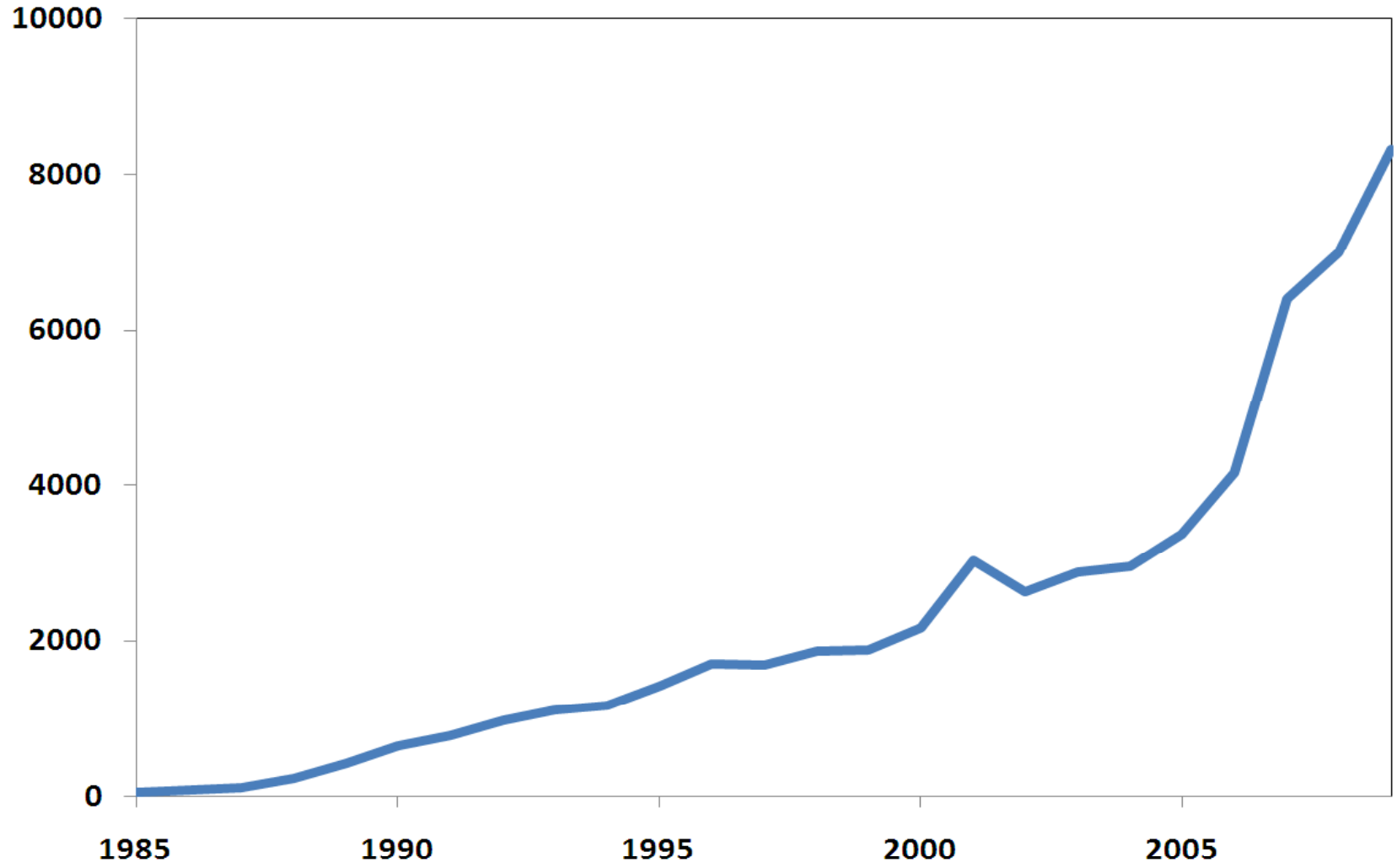
But new sources of hydrocarbons....



Hydraulic Fracturing

Source: www.gaslandthemovie.com

Number of scholarly articles with “climate change” in the title published annually



Source: derived from Google Scholar

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Universe 1

Projecting – Exxon Mobil

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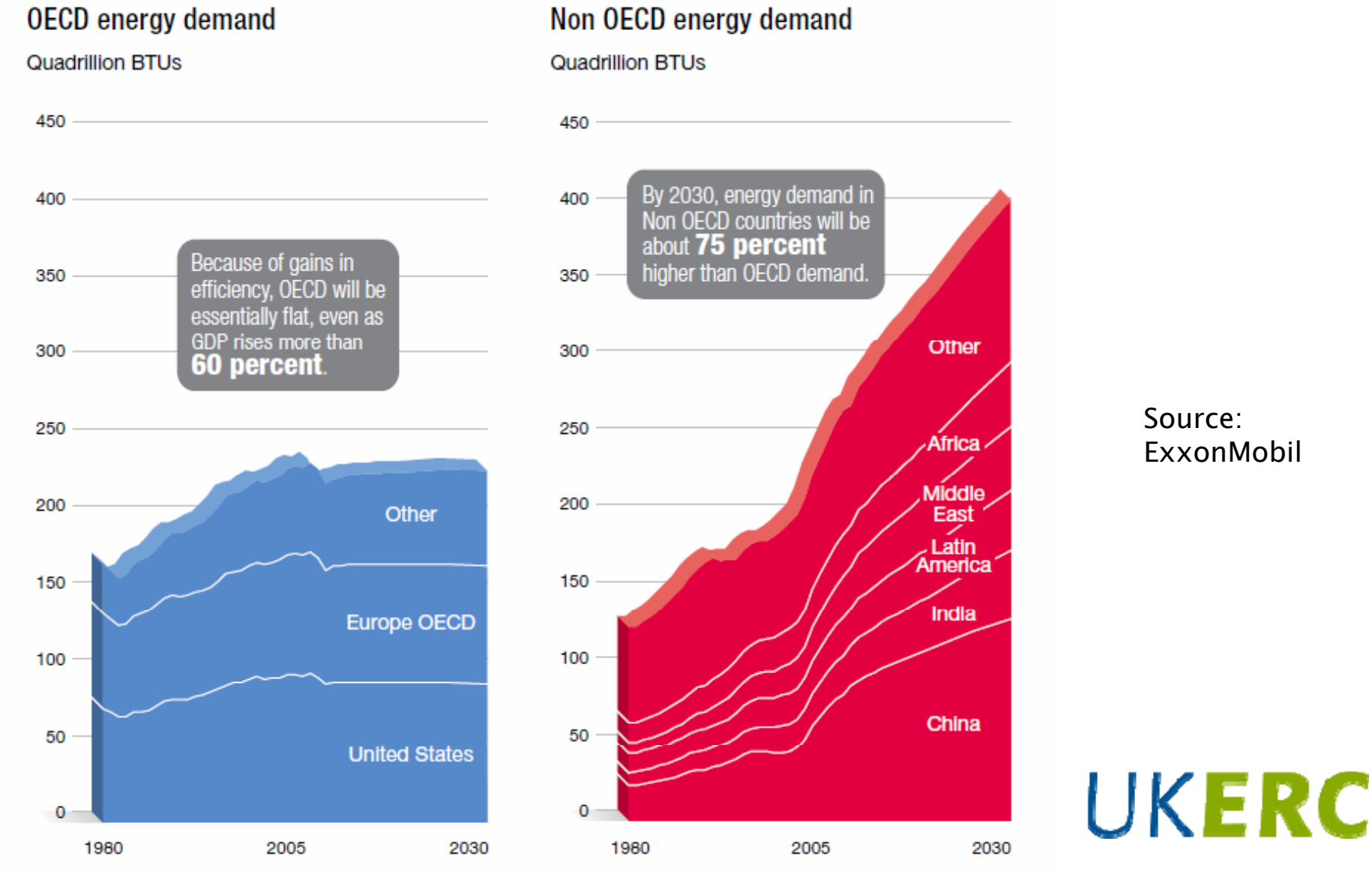
ExxonMobil:
The Outlook for Energy: A View to 2030



Source:
ExxonMobil

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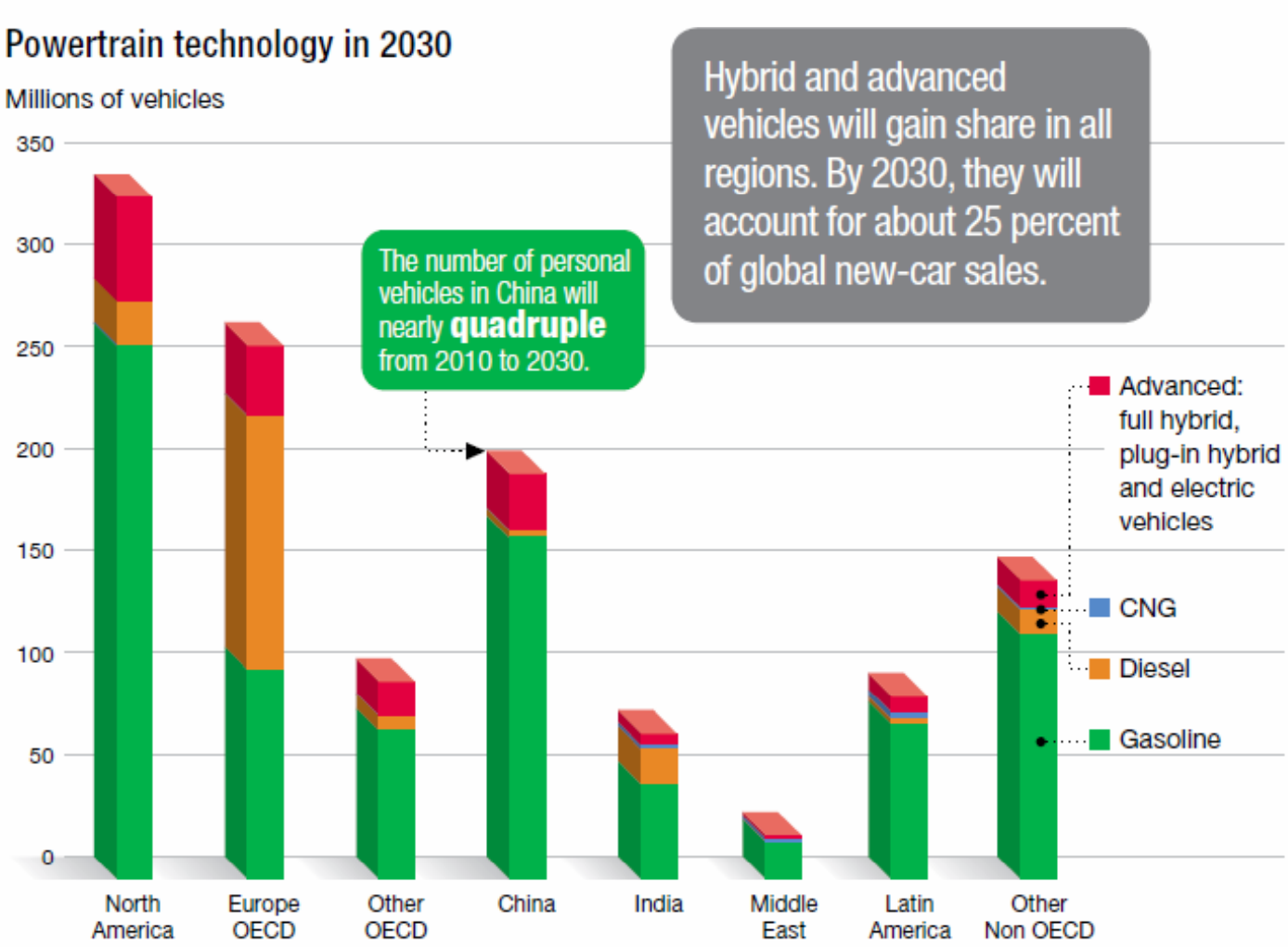
Powering vehicles



Source: ExxonMobil

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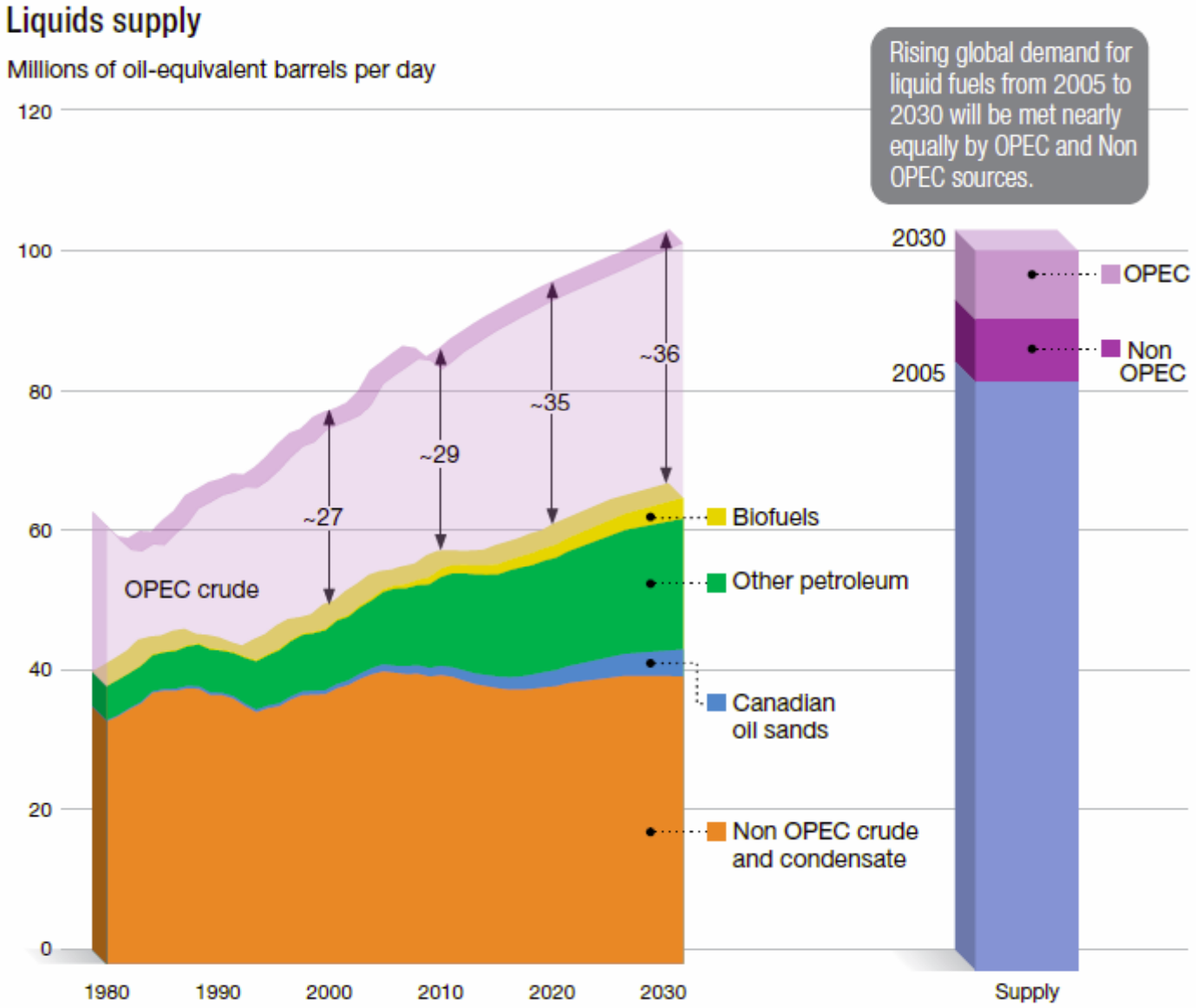
Liquid fuel markets



Source: ExxonMobil

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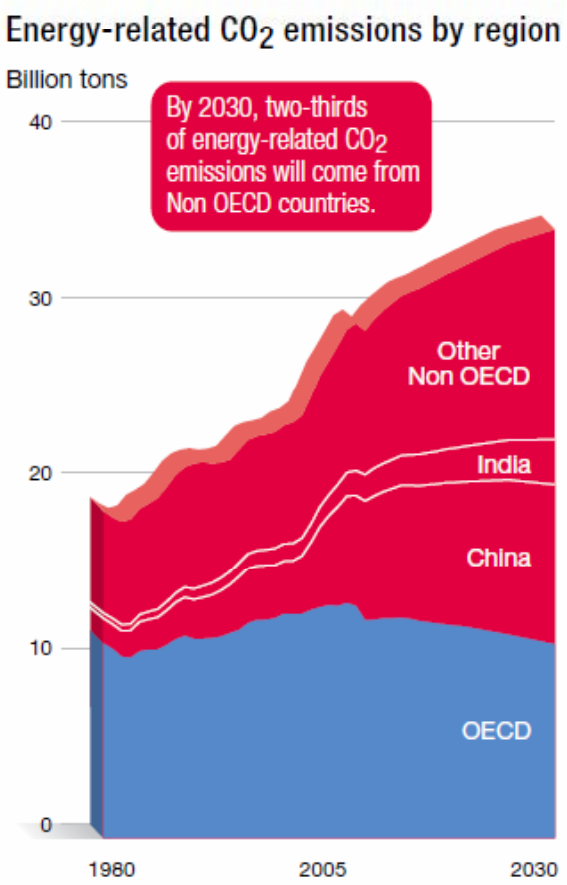
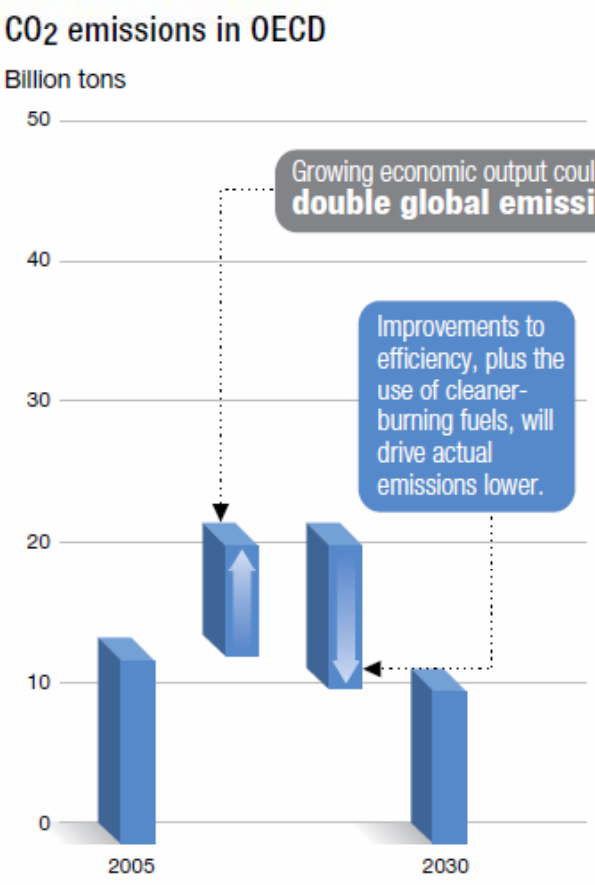
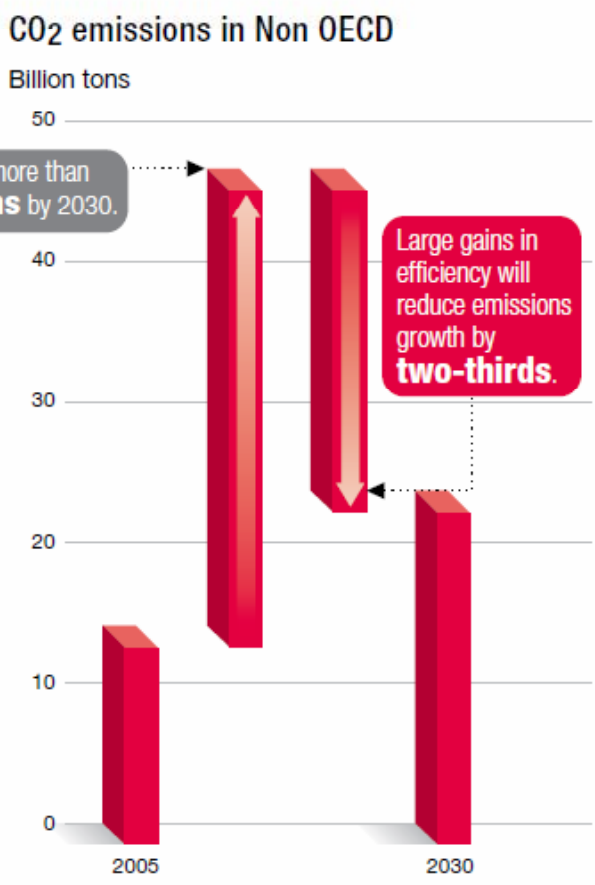
What it means for CO_2







Source: ExxonMobil

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Universe 2

Back-casting – International Energy Agency

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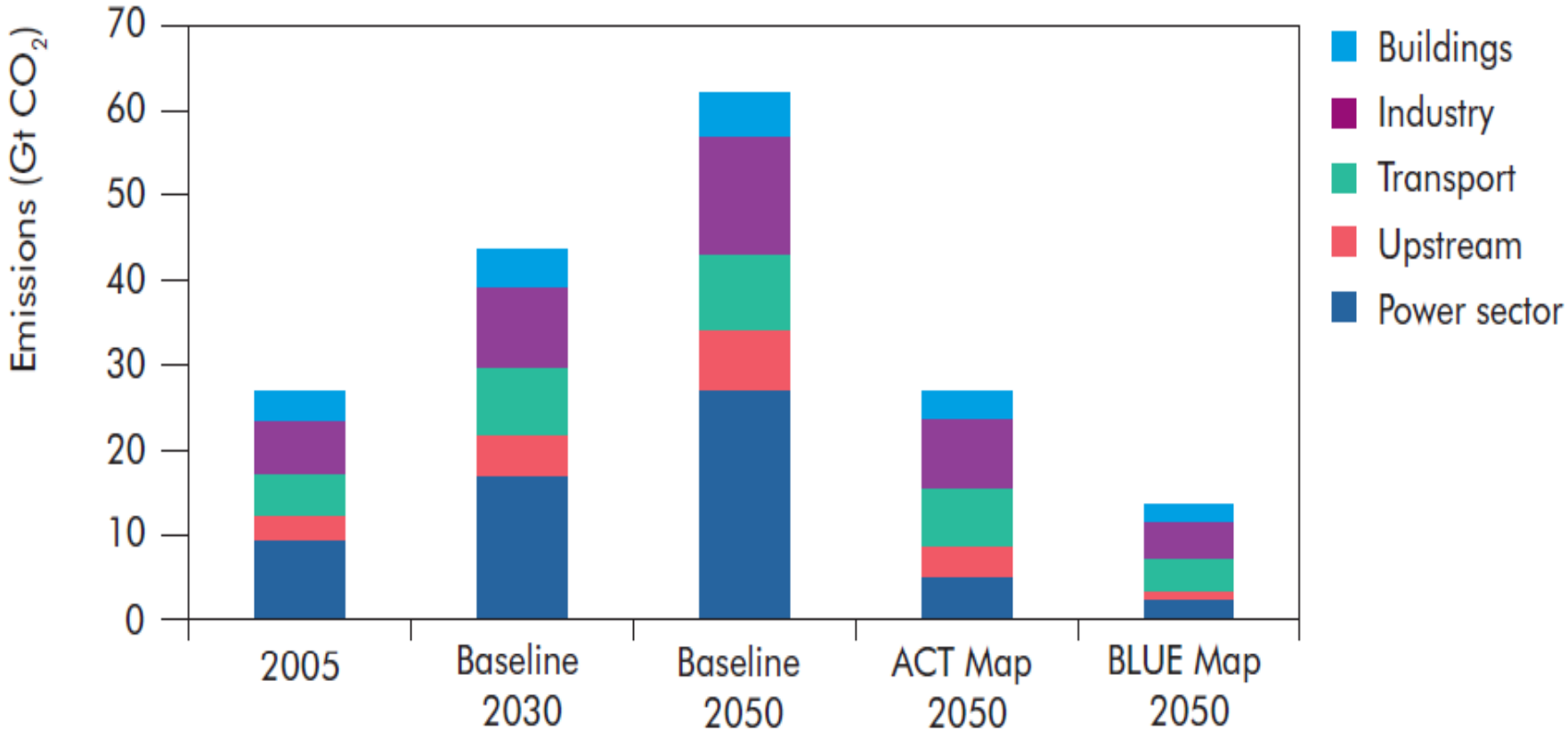
Global CO_2 emissions: IEA ACT and BLUE Map scenarios



Source: IEA

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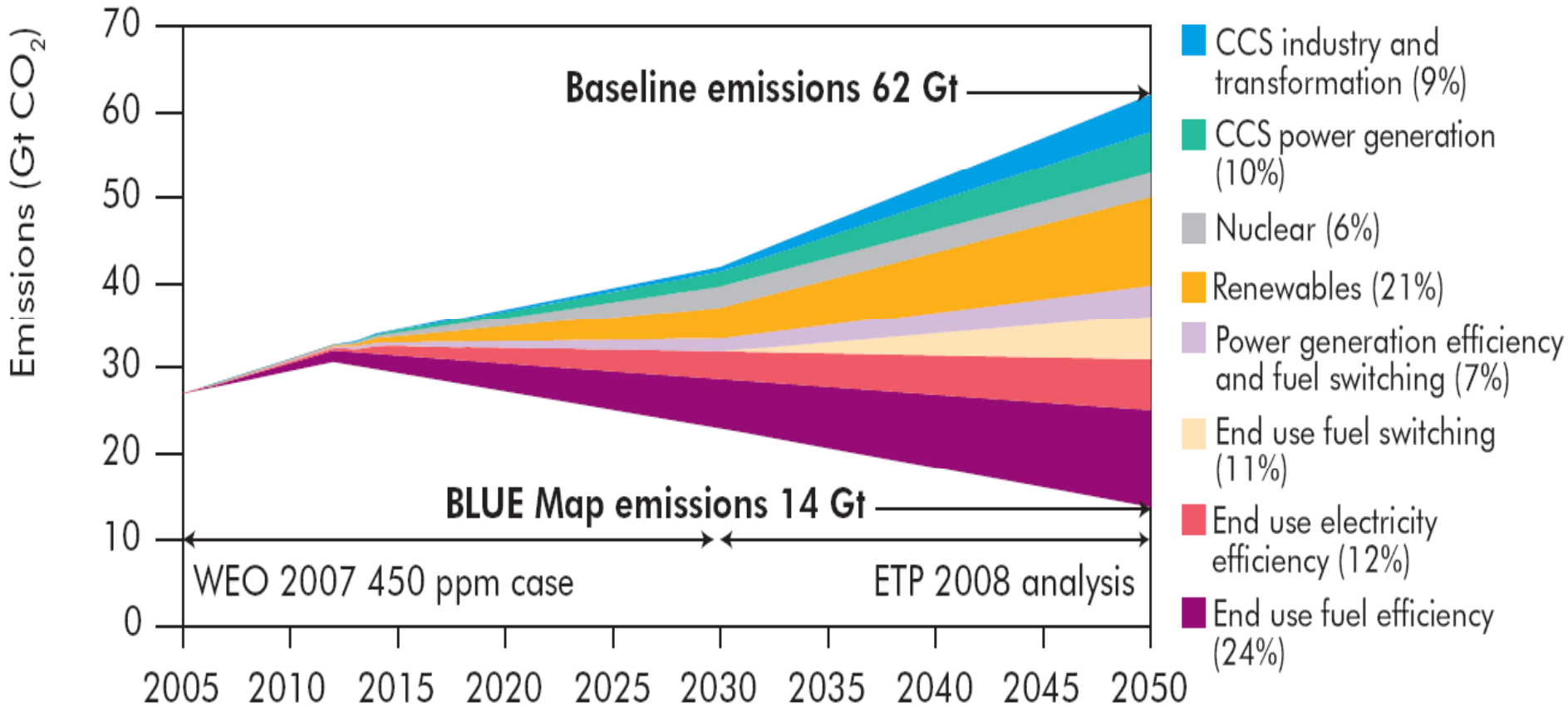
Contribution of emission reduction options: IEA BLUE Map scenario



Source: IEA

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The decarbonisation of power/electrification narrative

Reducing power sector emissions:
Renewables (Wind, solar, tidal and marine, biomass), nuclear, CCS

Application of power to transport and heat

Reducing transport emissions:

- Fuel efficiency
- Electric/plug-in hybrids
- Sustainable Bio fuels

Reducing heat emissions:

- Energy efficiency
- Behaviour change
- Electric heat (e.g. heat pumps, storage heating)
- Biomass boilers
- CCS in industry

Source: Committee on Climate Change

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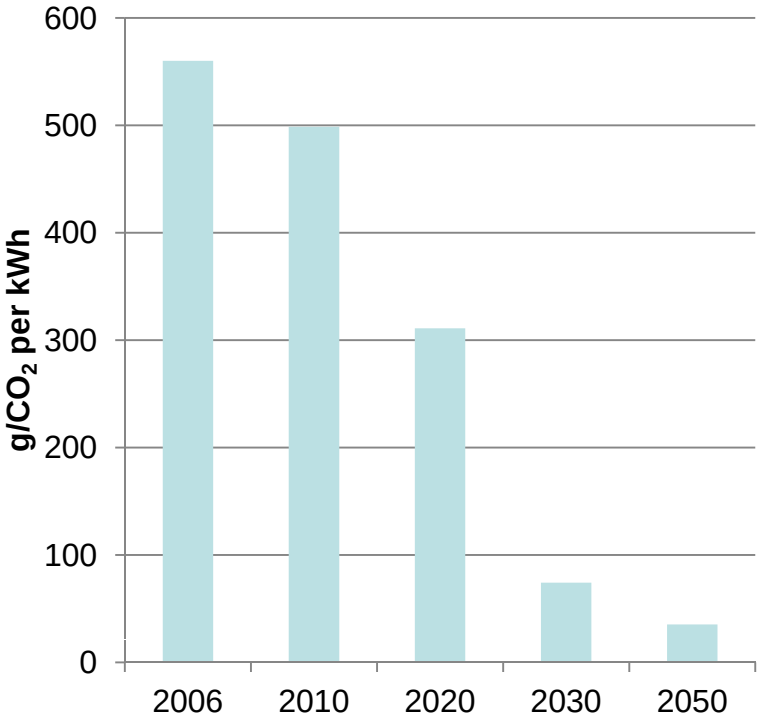
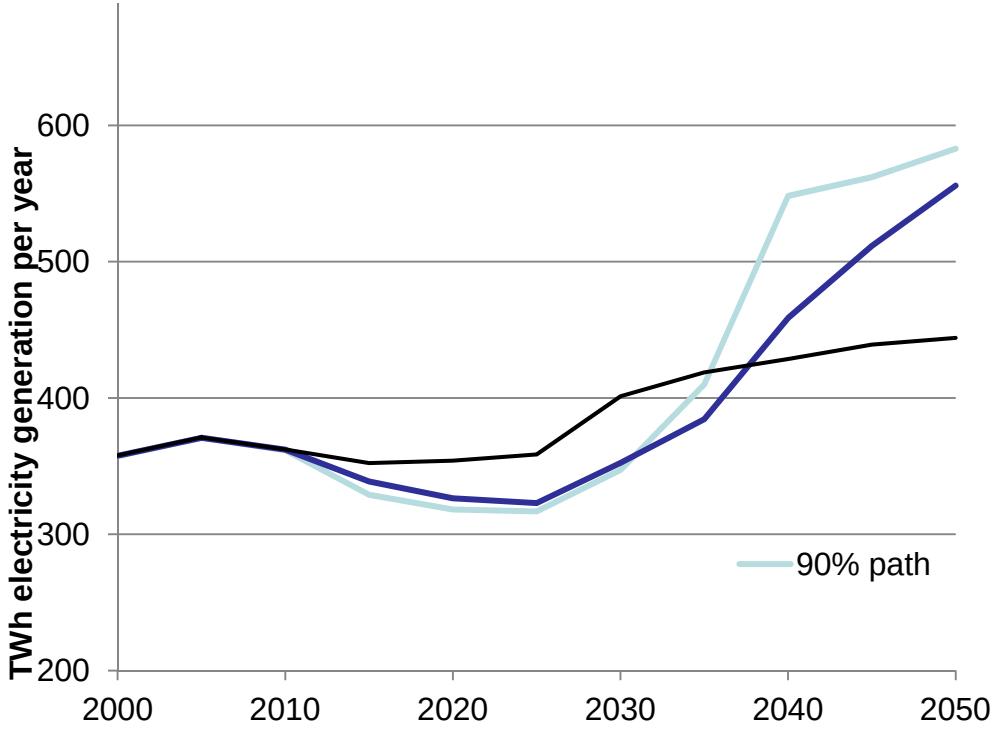
Power sector evolution

Emissions intensity to 2050



Power generation to 2050



Source: Committee on Climate Change

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Universe 3

Exploring – Shell in 2008

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Shell scenarios

- ***Scramble***
  - a focus on national energy security.
  - attention naturally falls on supply-side levers
  - local resource development.
  - growth in coal and biofuels
- ***Blueprints***
  - new coalitions of interests
  - fears about life style and economic prospects forge new alliances that promote action
  - a critical mass of prompt, parallel responses to supply, demand, and climate stresses

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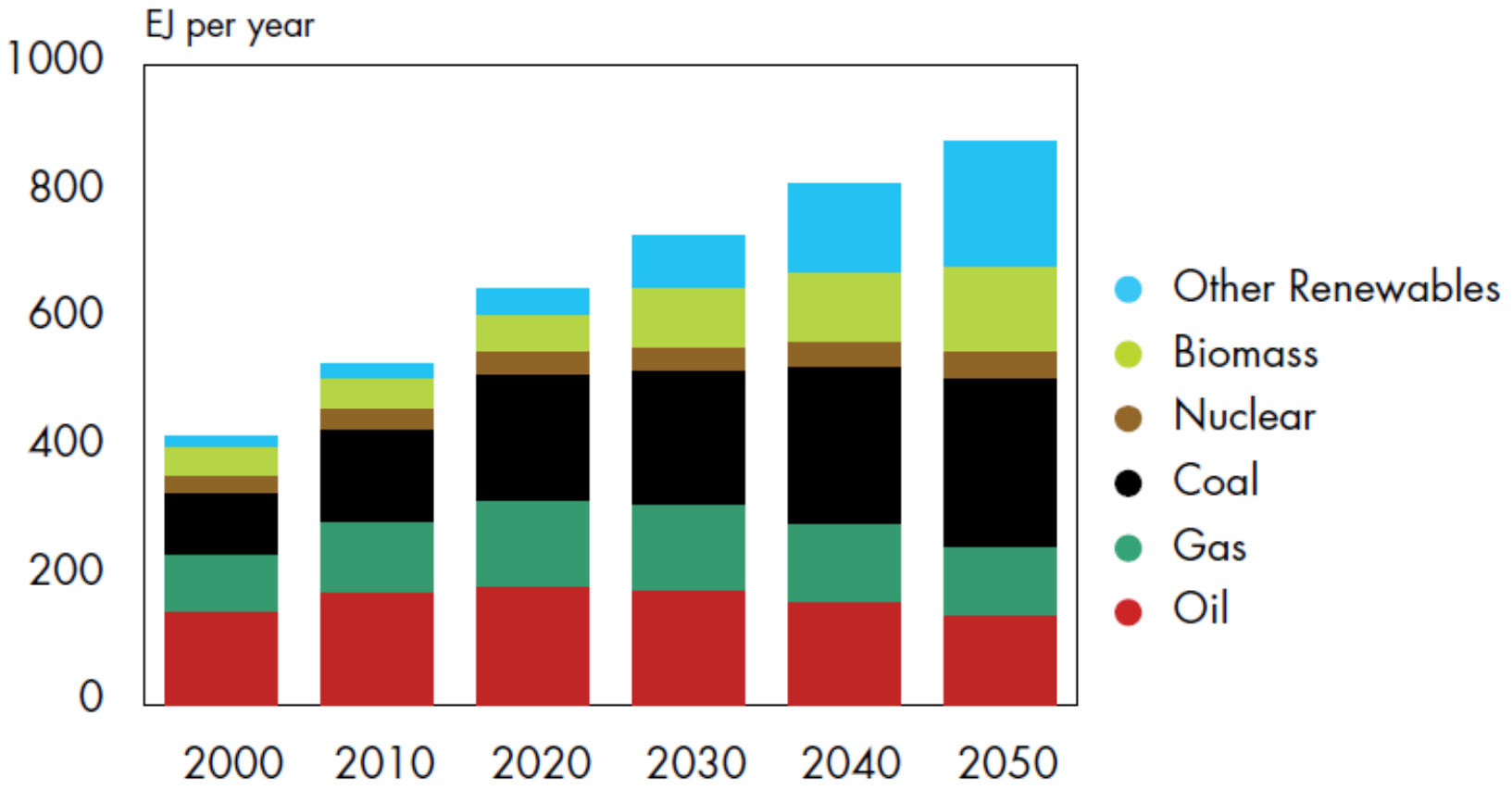
Primary energy by source – SCRAMBLE



Biomass includes traditional renewables such as wood, dung, etc.

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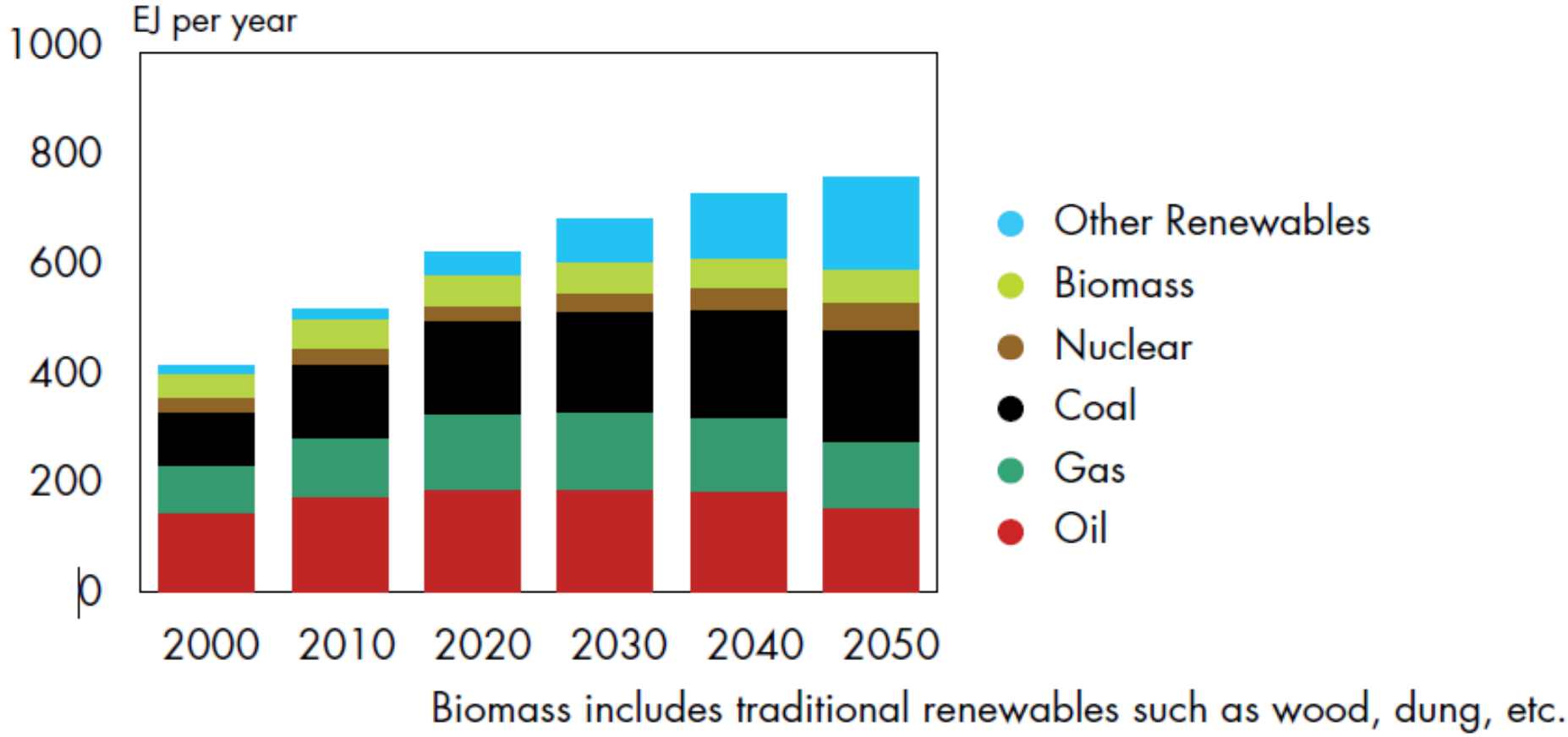
Source: Shell

Primary energy by source – BLUEPRINTS



Source: Shell

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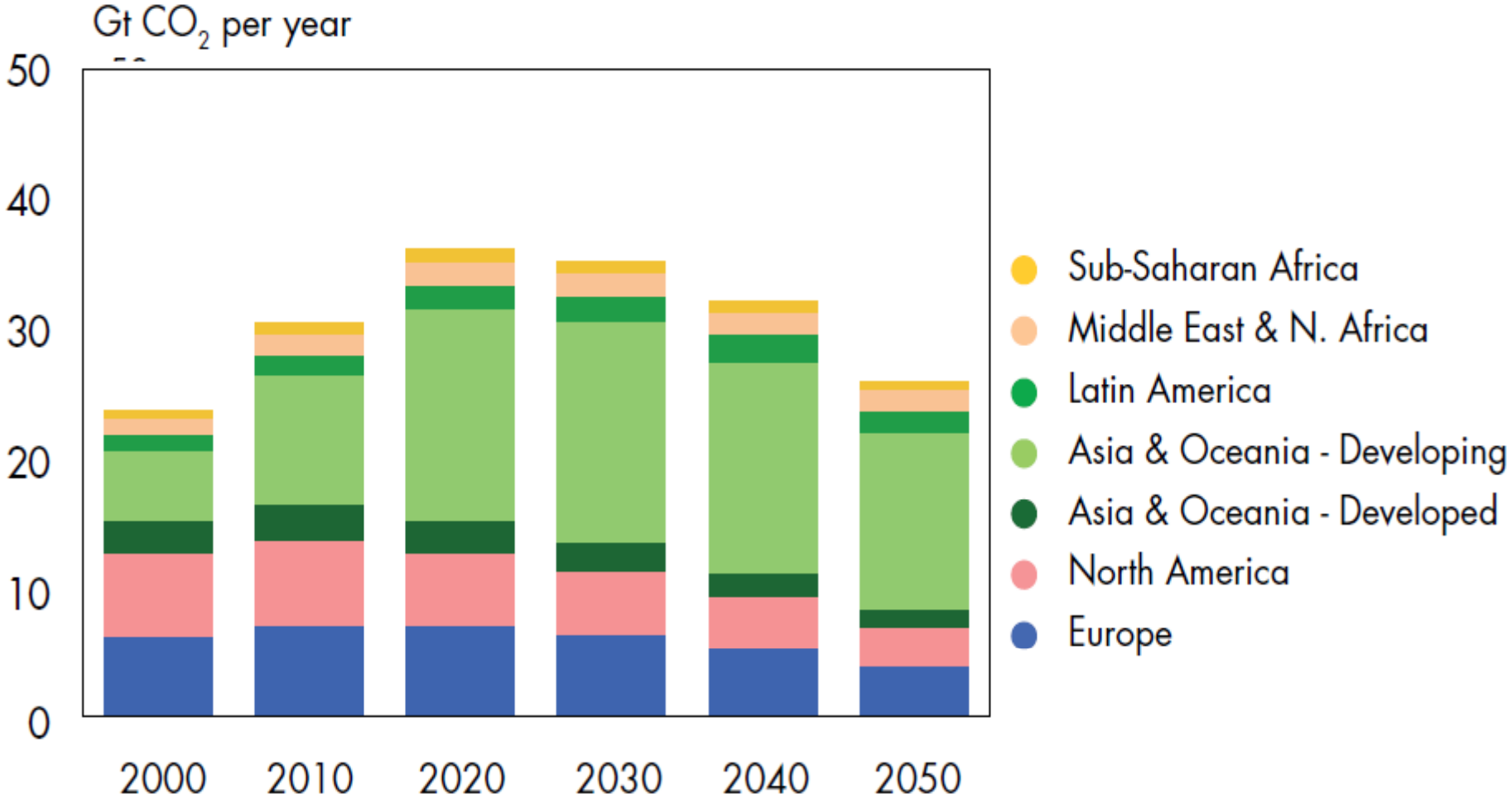
Direct CO_2 emissions from energy: BLUEPRINTS



Source: Shell

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Solutions

- Security is multi-faceted, so a portfolio of responses:
  - Self-reliance, but also interconnection
  - Diversity – technologies, transmission and distribution
  - Storage and other infrastructure
  - Demand reduction (efficiency, behaviour)
  - Well-functioning markets

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Elements of resilience considered in UKERC study of security/decarbonisation

- Lower energy intensity —> lower energy demand, lower imports (3% decoupling of demand from GDP)
- Diversity:
  - Primary energy supply (maximum 40% share for any source)
  - Electricity generation mix (maximum 40% share for any source)
- Reliability in network industries
- Infrastructure

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Energy demand in 2025 with respect to a 2000 baseline

REFERENCE (REF)		**RESILIENT (R)**	
Primary energy demand:	-7%	Primary energy demand:	-20%
Final energy demand:	+2%	Final energy demand:	-16%
Electricity demand:	+14%	Electricity demand:	+1%
Residential demand:	+5%	Residential demand:	-23%
LOW-CARBON (LC)		**LOW-CARBON RESILIENT (LCR)**	
Primary energy demand:	-13%	Primary energy demand:	-20%
Final energy demand:	-2%	Final energy demand:	-16%
Electricity demand:	+6%	Electricity demand:	-8%
Residential demand:	0%	Residential demand:	-20%

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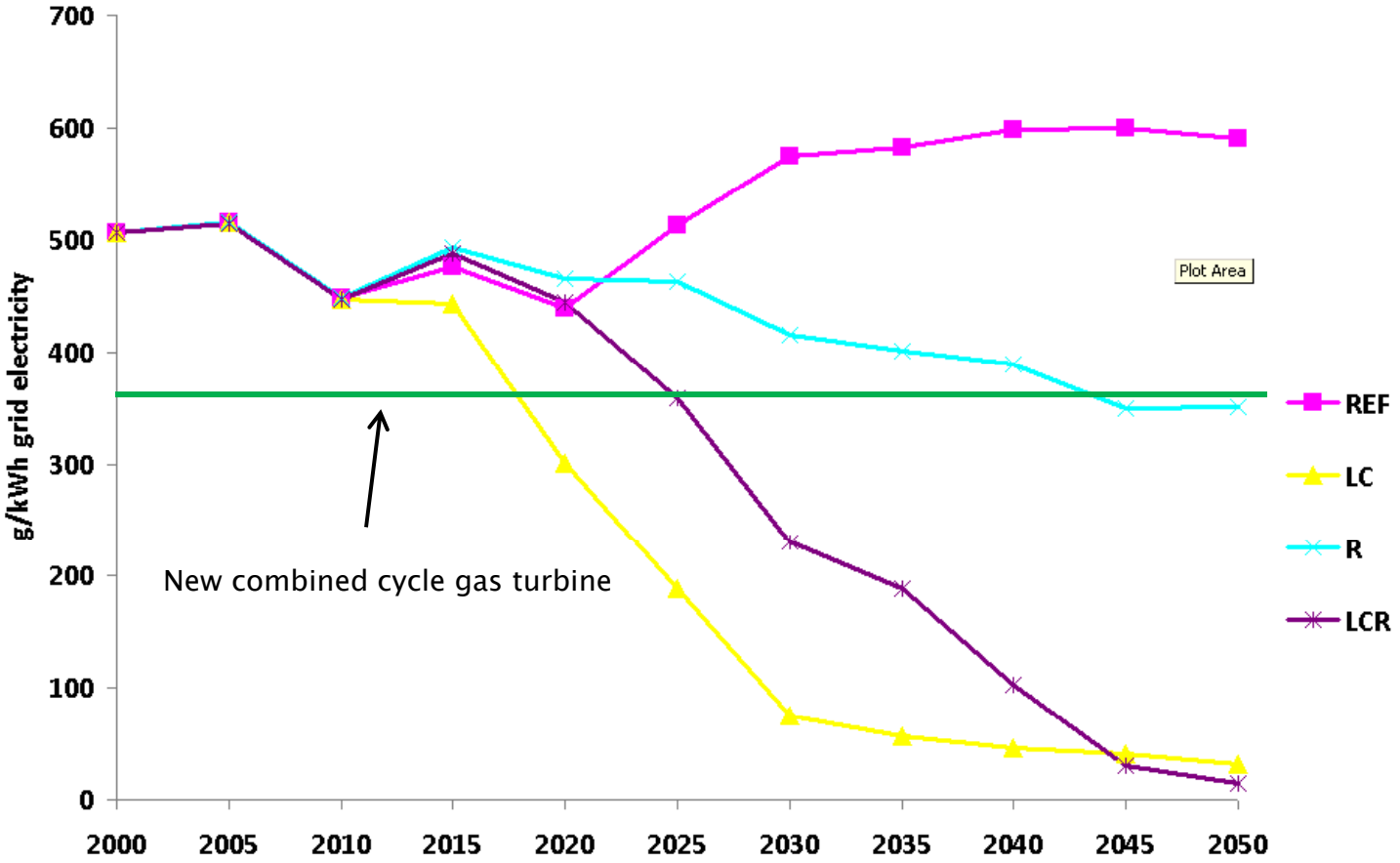
Carbon intensity of grid electricity



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Climate and energy security

- End-use efficiency, behaviour change unambiguously contribute to both goals
- Renewables (and more controversially nuclear) reduce exposure to volatile global energy markets

  ...but intermittent renewables create reliability challenges...

  ..and prices of traded biofuels may themselves be volatile

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Aviation emissions and the ETS

Allowances will be required for all flights arriving from or departing to destinations outside the EU.

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India rallies 30 nations over EU airline emission fee

Plan to counter bloc's plan to impose carbon curbs on flights

Bloomberg

Published: 00:00 September 30, 2011

GULF NEWS

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New Delhi: India is working with more than 30 nations to draw up a strategy to counter the European Union's plan to impose emission charges on airlines flying into the region starting next year.

"How can they dictate terms to us and why should we accept it?" Vayalar Ravi, India's civil aviation minister, said in an interview in New Delhi on Wednesday before a meeting of the International Civil Aviation Organisation on the EU's plan. "This is their fantasy."

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How Much Will You Make?

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Sustainability framework for biofuels

- Biofuels are excluded from the accounting in the Fuel Quality Directive if they come from:
  - land with high diversity value (e.g. primary forest)
  - land with high carbon stock (e.g. wetlands)
  - peatland
- Life cycle emissions considered in the Renewable Energy and Fuel Quality Directives

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Fuel Quality Directive and unconventional oil

- EU Commission has proposed life cycle GHG emissions for oil from tar sands 22% higher than those for conventional oil. Still for Council/Parliament to decide.

- Opposed by some member States

FUEL QUALITY DIRECTIVE - ARTICLE 7a: Implementing provisions

MEP briefing on Tar Sands and the role of the European Parliament

16th March 2011

Using European Parliament's power of scrutiny:

We call on Parliament to confirm its message to the Commission that

i) the immediate inclusion of a default value for tar sands and shale oil in Fuel Quality Directive implementing measures is expected, and

ii) failure to address tar sands emissions means Parliament will move to reject the proposals when presented.

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Conclusions

- The vision of the LCS is not universally shared...we have to be realistic about both indifference and opposition
- Opportunities to link climate policy to other policy concerns and domains (e.g. security) must be sought
- Lack of progress → frustration → unilateral action → tension (e.g. trade)...how do we manage constructive dialogue?

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