

Oil Supply Security and Sustainability

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A Passion to Perform.

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Churchill's Law

Safety and certainty in oil
lie in variety and variety alone.

Thatcher's Law

The unexpected happens.
You had better prepare for it.

Palmerston's Law

We have no eternal allies and no
perpetual enemies. Our interests
are perpetual and eternal.

Vulnerability

- Rise in import quantity and balance of payments / currency issues
- Disruptions / market failures
- Political turmoil (ME, Africa, So.Am)
- Price spikes / market pressures
- Homeland infrastructure

Traditional responses to energy security (risk management)

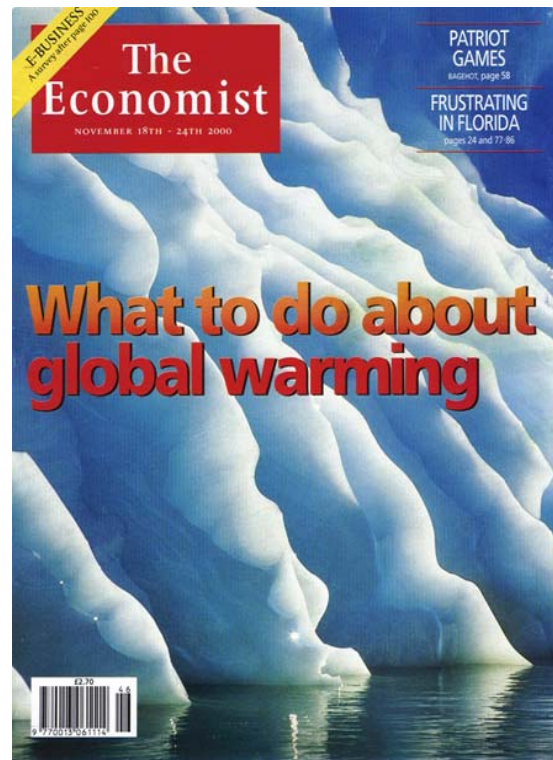
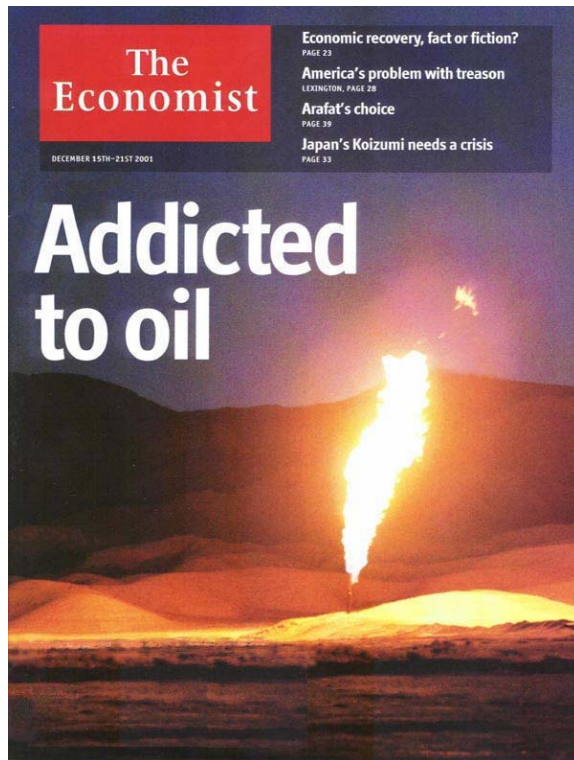
- Demand restraint (security of demand?)
- Supply diversity
- Surge production (location?)
- Strategic stocks (when to use?)
- International co-operation / IEA
- Flexible markets (futures; technology)

Source: Deutsche Bank



Thinking About Energy Security

...which one of these do you worry about?



Source: Economist.com

How Others See America on Energy Security

...can this divide be bridged?

Day at the Beach



**Non-American View of
a US Day at the Beach**



...adequate supplies at reasonable prices

Fuel use and supplier diversity

Market forces except for externalities

Environmental protection

Keep competitive in global trade

Support research and development

Monitor security implications



...”mmm she said, this porridge is **JUST** right!”

Too High

- Inflation
- Economic harm
- Too much revenue in wrong pockets

Too Low

- Import dependence on low-cost Mideast producers
- Too little revenue in the right pockets

Source: Deutsche Bank

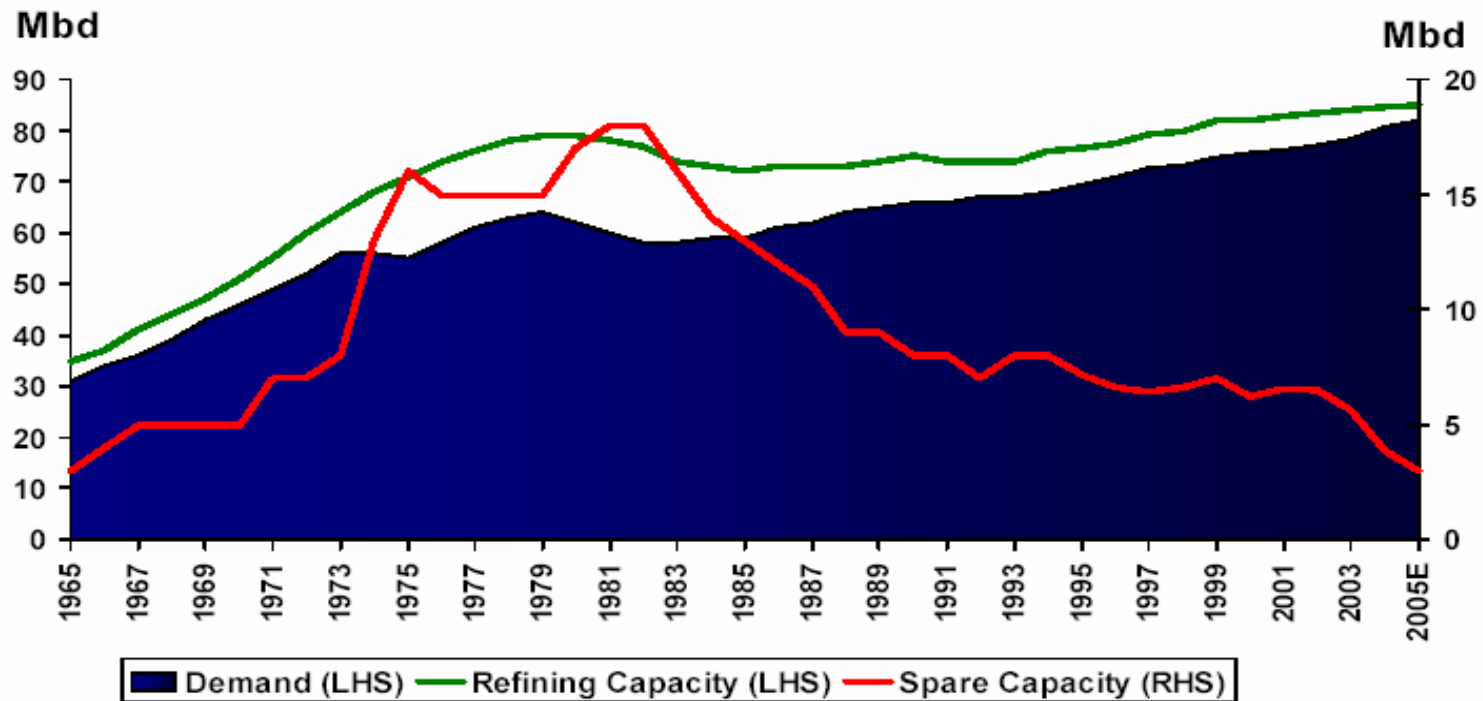
...more than just worrying about crude oil imports

- ❑ Refining capacity and dependence on product imports
- ❑ Ability to upgrade growing proportion of heavier oil
- ❑ Access to and location of reserves
- ❑ Sabotage of oil facilities
- ❑ Transportation bottlenecks and choke-points
- ❑ Weather vulnerabilities

Source: IEA, Deutsche Bank

Global Refining Capacity Still Squeezed

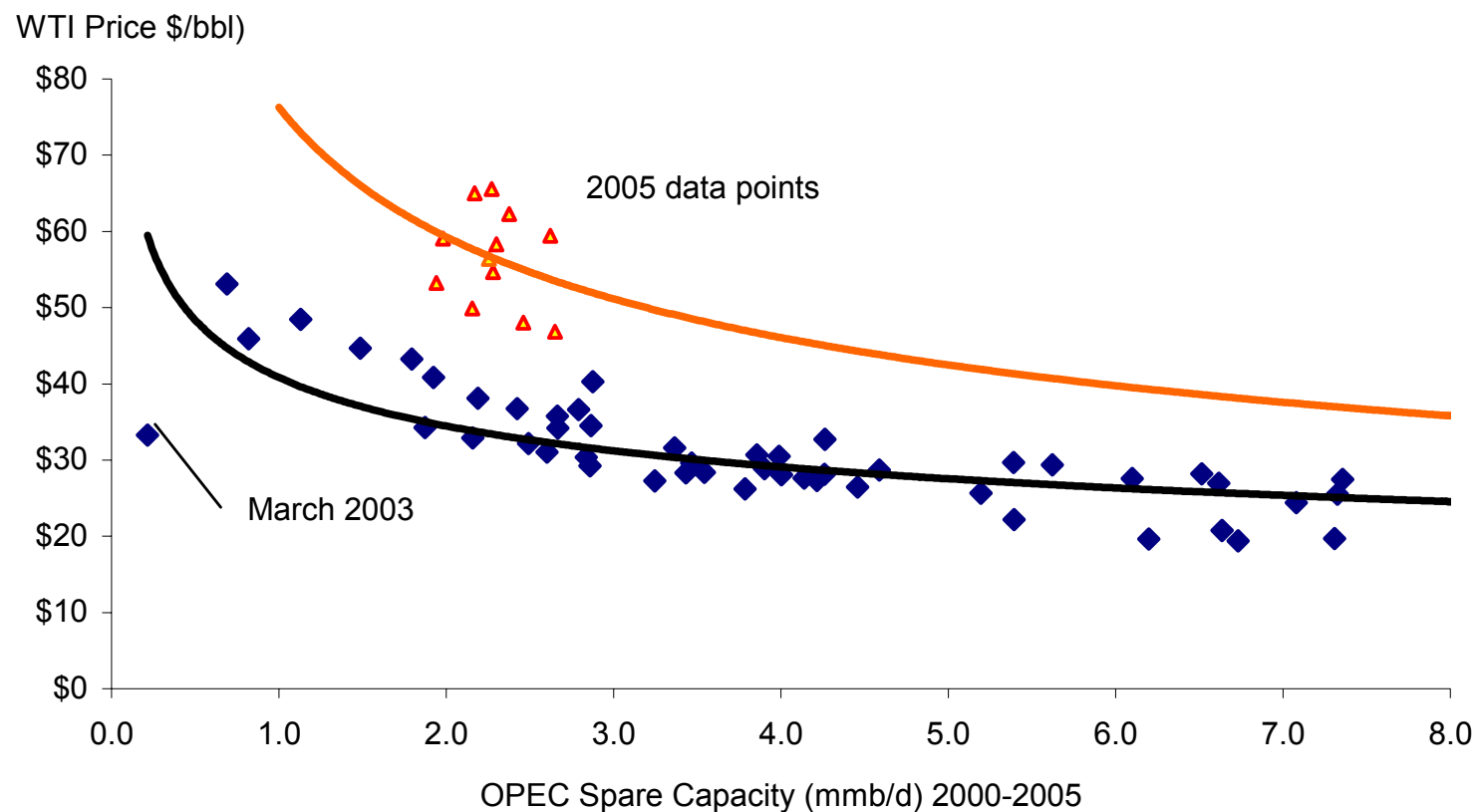
- Spare capacity tightened significantly in the last two years



Source: Wood Mackenzie Consultants

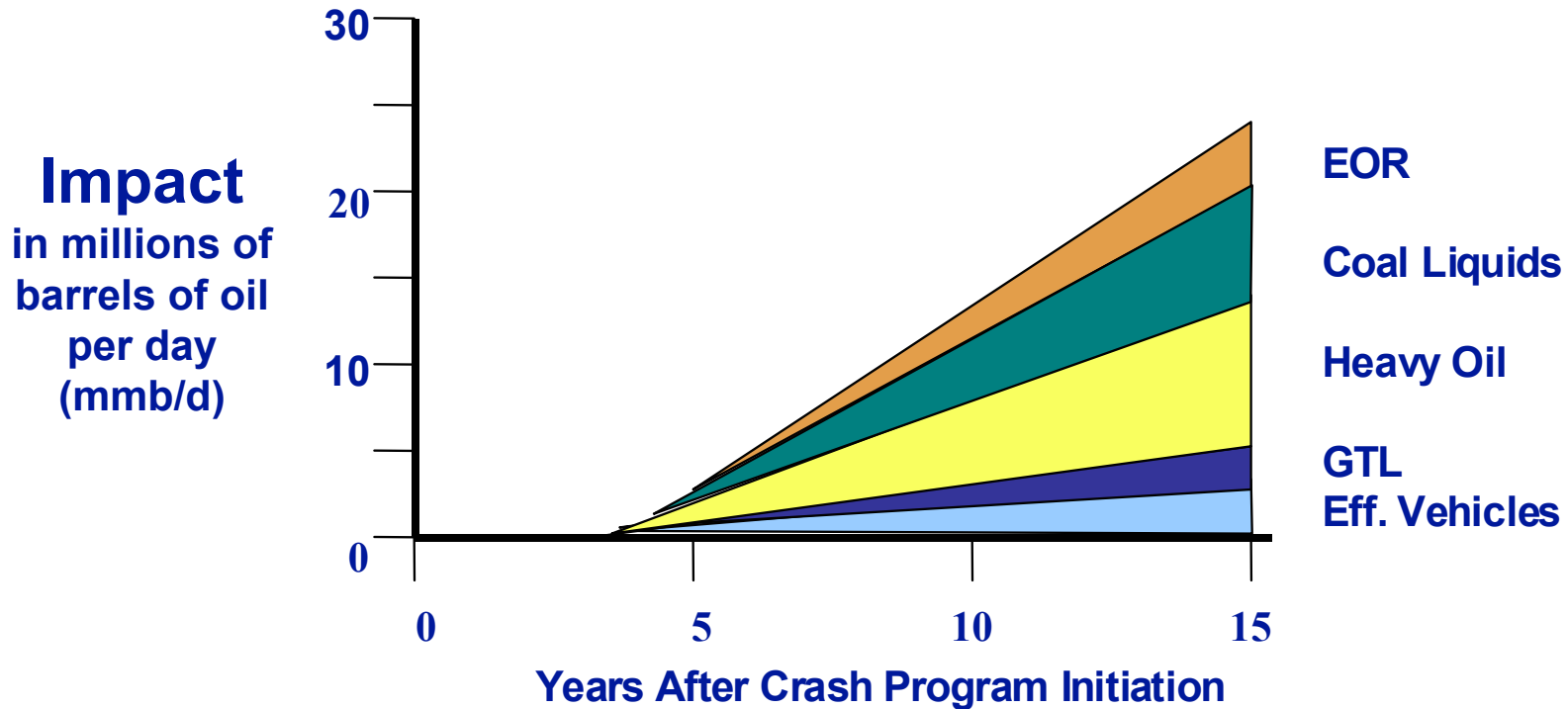
OPEC Spare Capacity vs. Price

- Prices are dependent on OPEC spare capacity
- The 2005 data is off the old regression line... and on a new one?



Crash Alternate Energy Program

...delay, then rapid growth Roughly 25 mmb/d 15 years after start



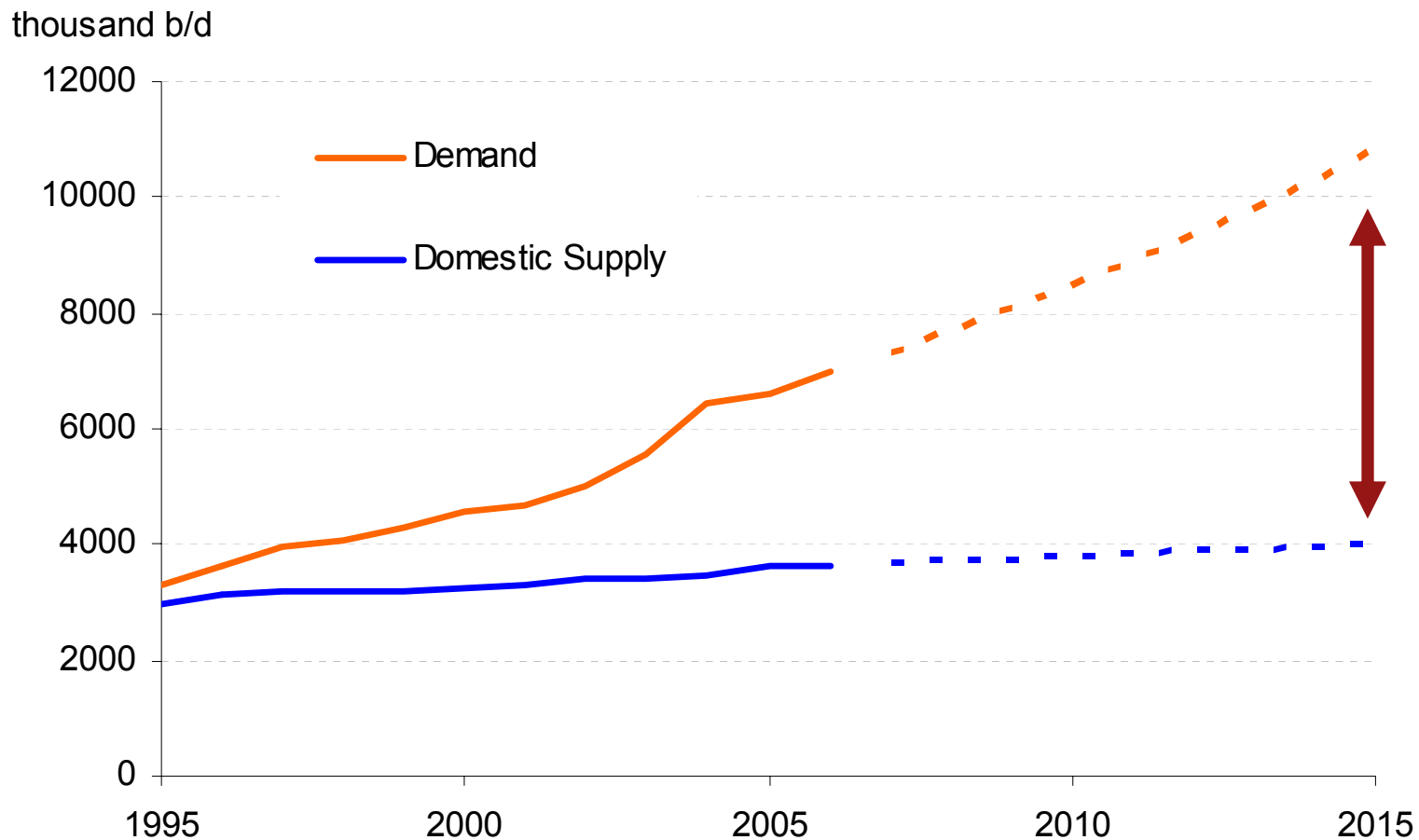


- What happens if developing countries follow historical OECD patterns of energy consumption?
- Will owners develop their energy resources in a timely manner?
- The relationship between sustainability and energy Corporate Social Responsibility (CSR) ?



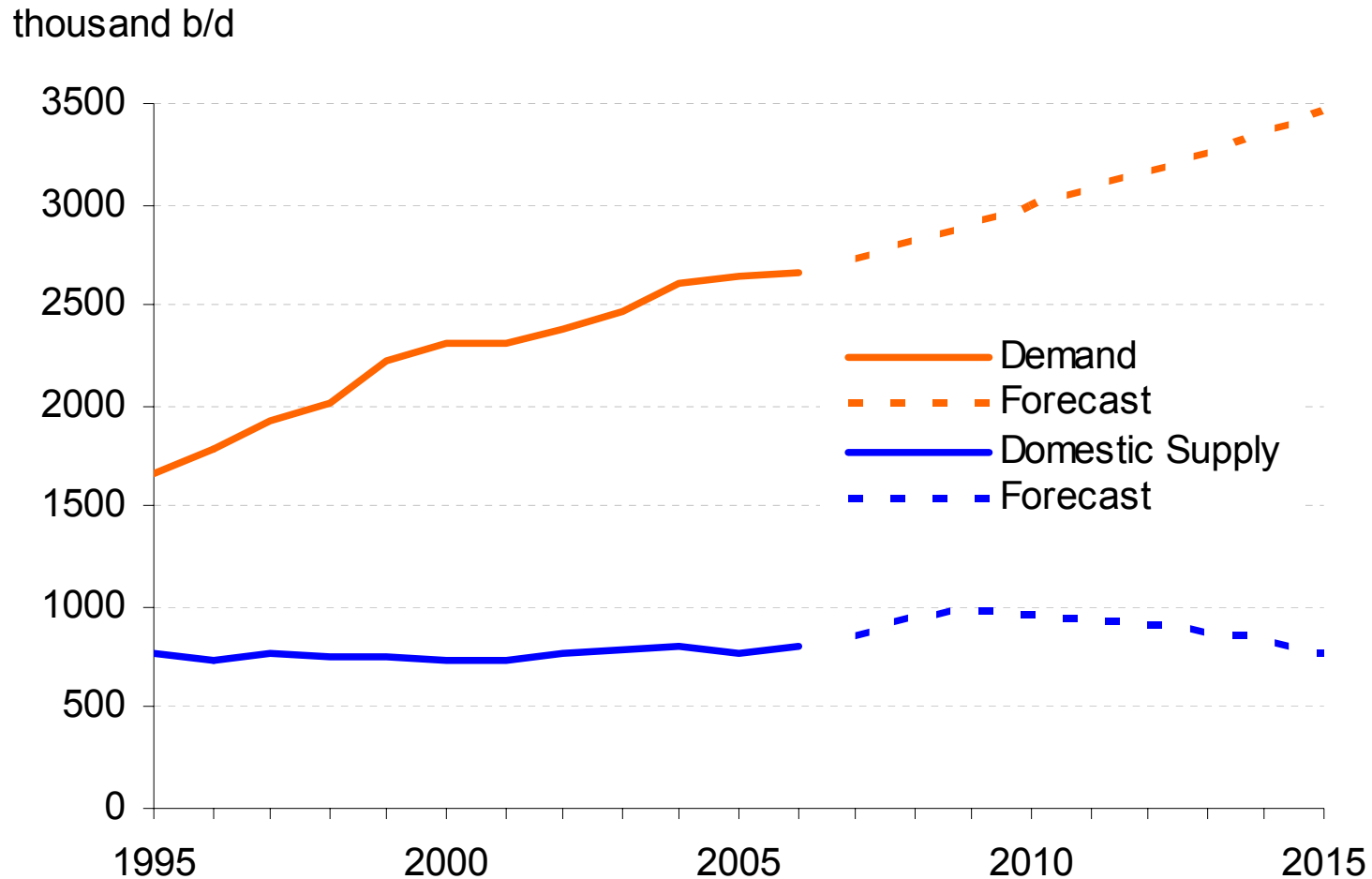
China's Oil Import Growth

...over 6mmb/d by 2015? ...even with "only" 5%/yr demand growth



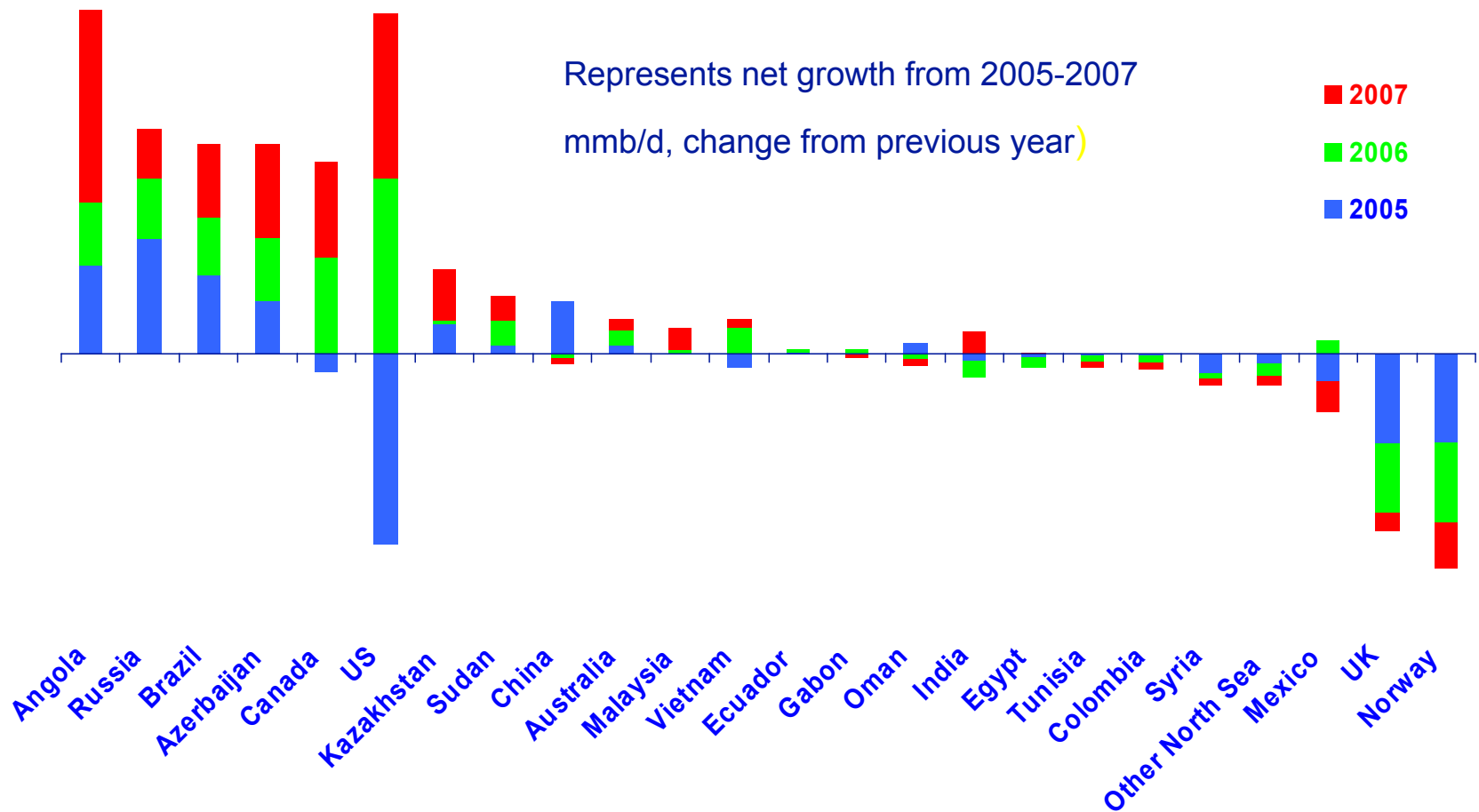
Oil Demand and Supply in India

...imports grow from 1.5mmb/d now to over 2.5mmb/d by 2015



World Oil Supply Gains in 2006-07

...Risky Business?



Corporate social responsibility (CSR) mega-trends entail significant shareholder risks and rewards; they may reshape the competitive landscape

- Climate change
- Health, safety, environment
- Ethical conduct

Source: Deutsche Bank

GDP Per Unit of Energy Consumed

...Japan most efficient, US above average

Country	Energy Used	GDP Produced	Ratio
Japan	515	4,165	8.1
Switzerland	31	246	7.8
United Kingdom	224	1,423	6.4
Italy	177	1,090	6.2
Germany	335	1,855	5.5
European Union 15	1479	7,907	5.3
France	256	1,312	5.1
Mexico	128	618	4.8
USA	2237	10,082	4.5
Spain	135	584	4.3
Netherlands	89	384	4.3
Norway	42	168	4.0
Sweden	53	210	4.0
WORLD AVERAGE	9125	30,939	3.4

GDP Per Unit of Energy Consumed

...lots of opportunities at the bottom- Russia and China

Country	Energy Used	GDP Produced	Ratio
WORLD AVERAGE	9125	30,939	3.4
Taiwan	85	282	3.3
Australia	110	358	3.3
Brazil	174	504	2.9
Canada	275	705	2.6
Singapore	39	86	2.2
South Korea	196	422	2.2
Turkey	70	149	2.1
Thailand	63	115	1.8
Saudi Arabia	111	186	1.7
India	315	480	1.5
Indonesia	98	146	1.5
China	840	1,159	1.4
South Africa	107	113	1.1
Iran	114	114	1.0
Russia	643	310	0.5



...can these be extended to developing economies?

Value of businesses to the economy

- tax, employment, skills, technology, infrastructure, ethics etc.

Value of energy to society

- improves quality of life; empowers and frees people

Monetization of natural resources

- contributes to improved distribution of revenue and other benefits

Protection of property rights correlated with protection of human rights

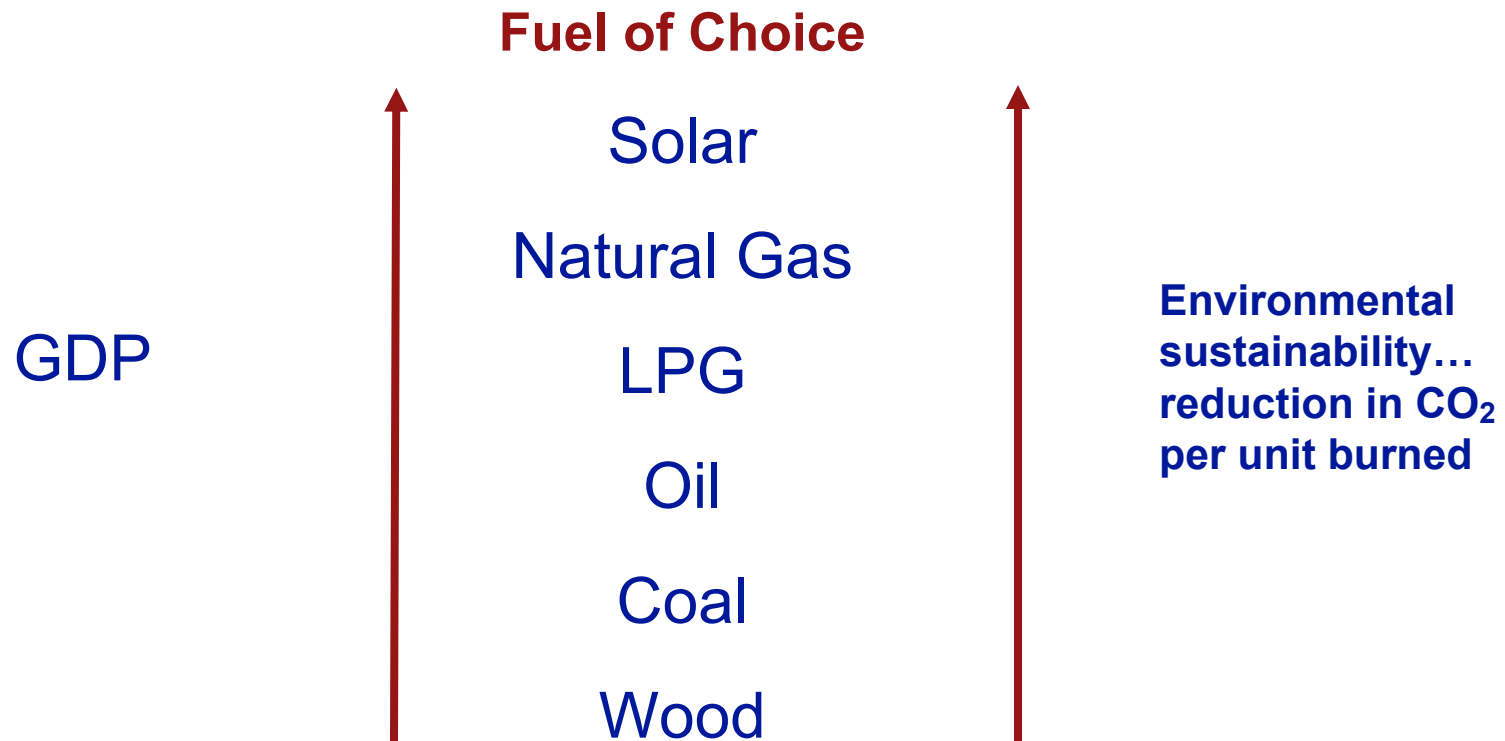
Source: Deutsche Bank
after Peter Davies, BP

...mainly in the developing economies

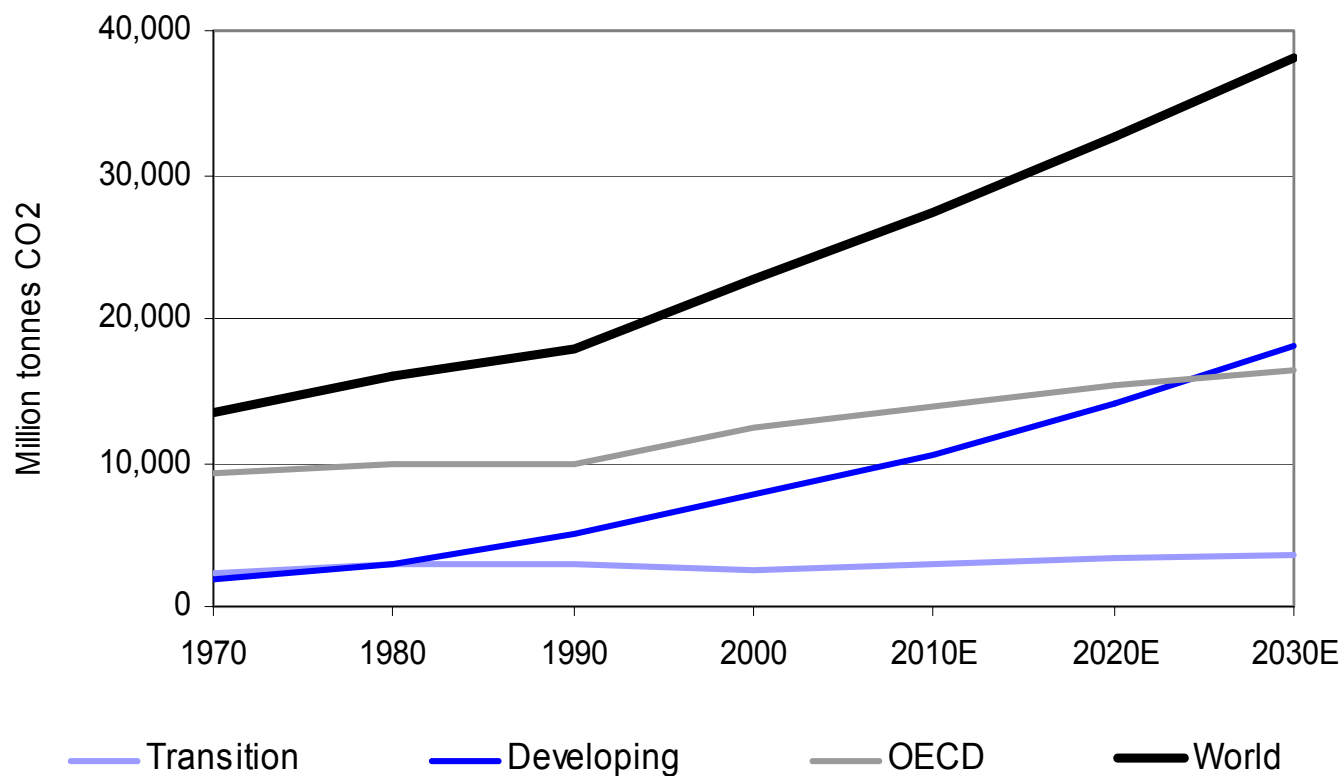
- **Corrupt, authoritarian & ineffective government**
- **High military spending & heightened risk of civil war**
- **Reduced economic growth**
- **Vulnerability to economic shocks**
- **Poor health care and poor education**

Source: Oxfam USA, Extractive Sectors & the Poor
<http://www.oxfamamerica.org/eireport/index.html>
after Peter Davies, BP

Can Wealth Be Environmentally Friendly?

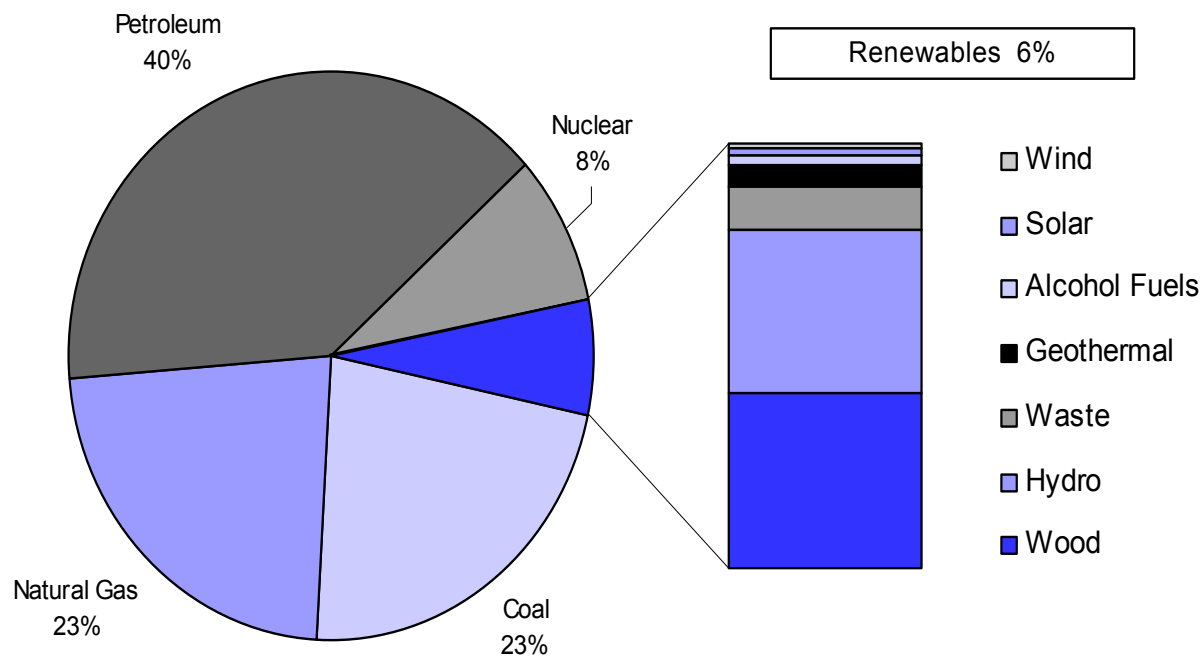


Source : Deutsche Bank



Source : International Energy Agency

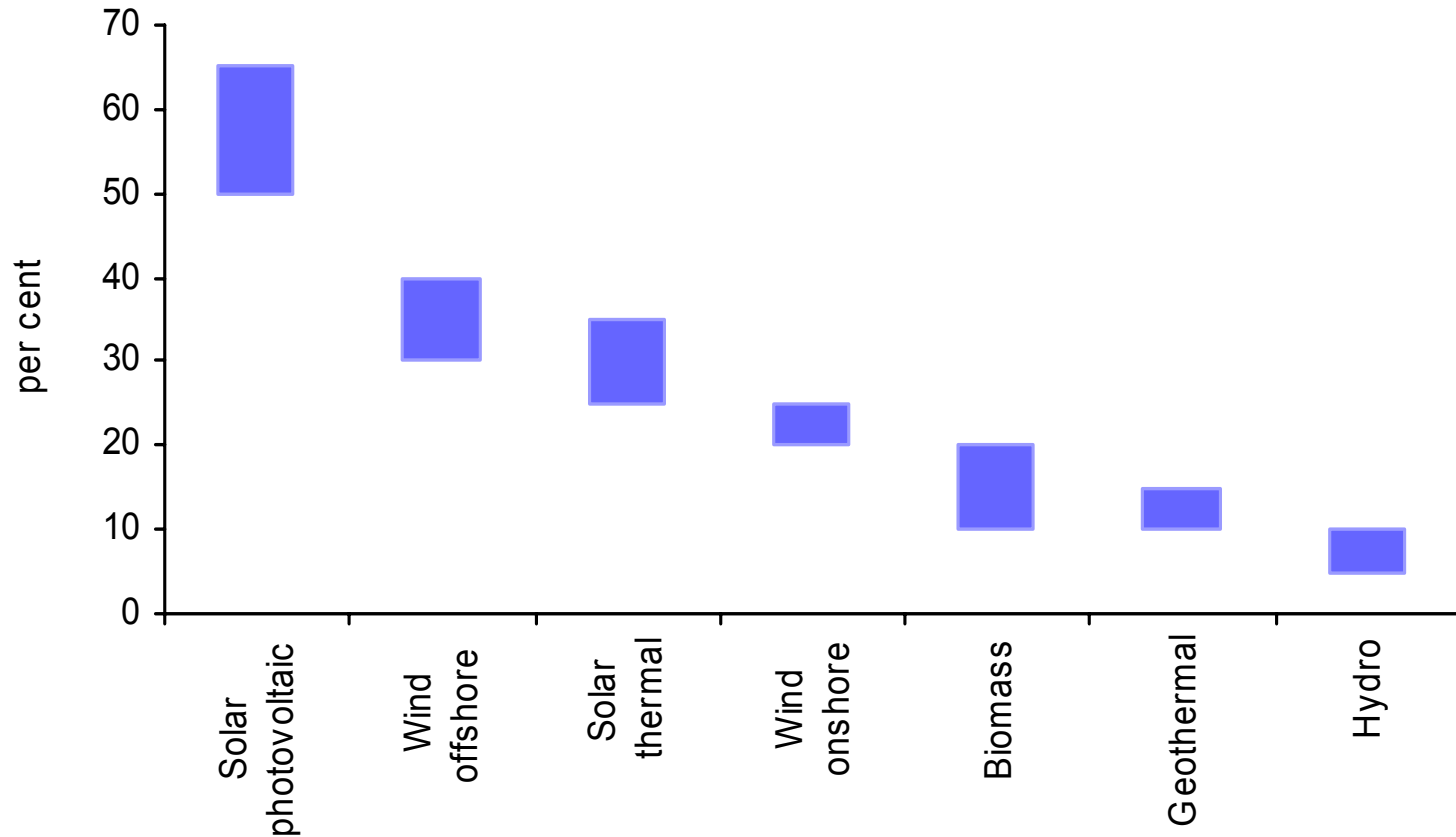
...green is still a small fraction



Source : US DOE/EIA

Expected Reductions in Capital Costs

...of renewable energy technologies, 2000-2030 (%)



Source : International Energy Agency

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[Adam Sieminski]

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