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Changing Paradigms in International Energy

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Consequences of an Emerging U.S. Energy and
Climate Policy on Global Energy Markets Conference

March 2nd 2010

The last few years has highlighted the additional turbulence and change we can expect to see in the energy system over the next 10 years



“The coming oil glut that will force prices to drop sharply”

FT, 30/12/09

“Copenhagen Fallout: Carbon Prices Fall on Weak Accord”

WSJ, 21/12/09

“European nuclear industry in grip of revival”

FT, 02/07/09

“Shale gas skepticism, and shale gas enthusiasm”

FT, 03/09/09

“America’s Natural Gas Revolution: A ‘shale gale’ of unconventional and abundant U.S. gas is transforming the energy market.”

WSJ, 02/11/09

“Gas, gas, gas”

The Economist, 14/12/09

“Supply crunch alarm – oh, no, wait...”

FT, 15/01/09

“Peak Demand or Peak Consumption? A Look at OECD Oil Demand”

The Oil Drum, 11/11/09

“The IEA on the carbon price: CO₂ has to cost much more”

FT, 10/11/09

“EU’s limited global clout under spotlight”

FT, 14/01/09

“Crude oil’s rollercoaster prices”

BBC, 07/08/09

“2010 could be warmest year on record”

The Independent, 10/12/09

“Planet B: How the underwhelming Copenhagen accord could yet turn into a useful document”

The Economist, 30/12/09

“Act now if you don’t want the lights to go out: The big energy companies are ready to change. But we’re still waiting for the Government to guide us to a low-carbon future”

The Times, 19/10/09

“Cold weather ‘doesn’t undermine global warming science”

Telegraph, 06/01/10

“A numbers game: The West African oil frontier”

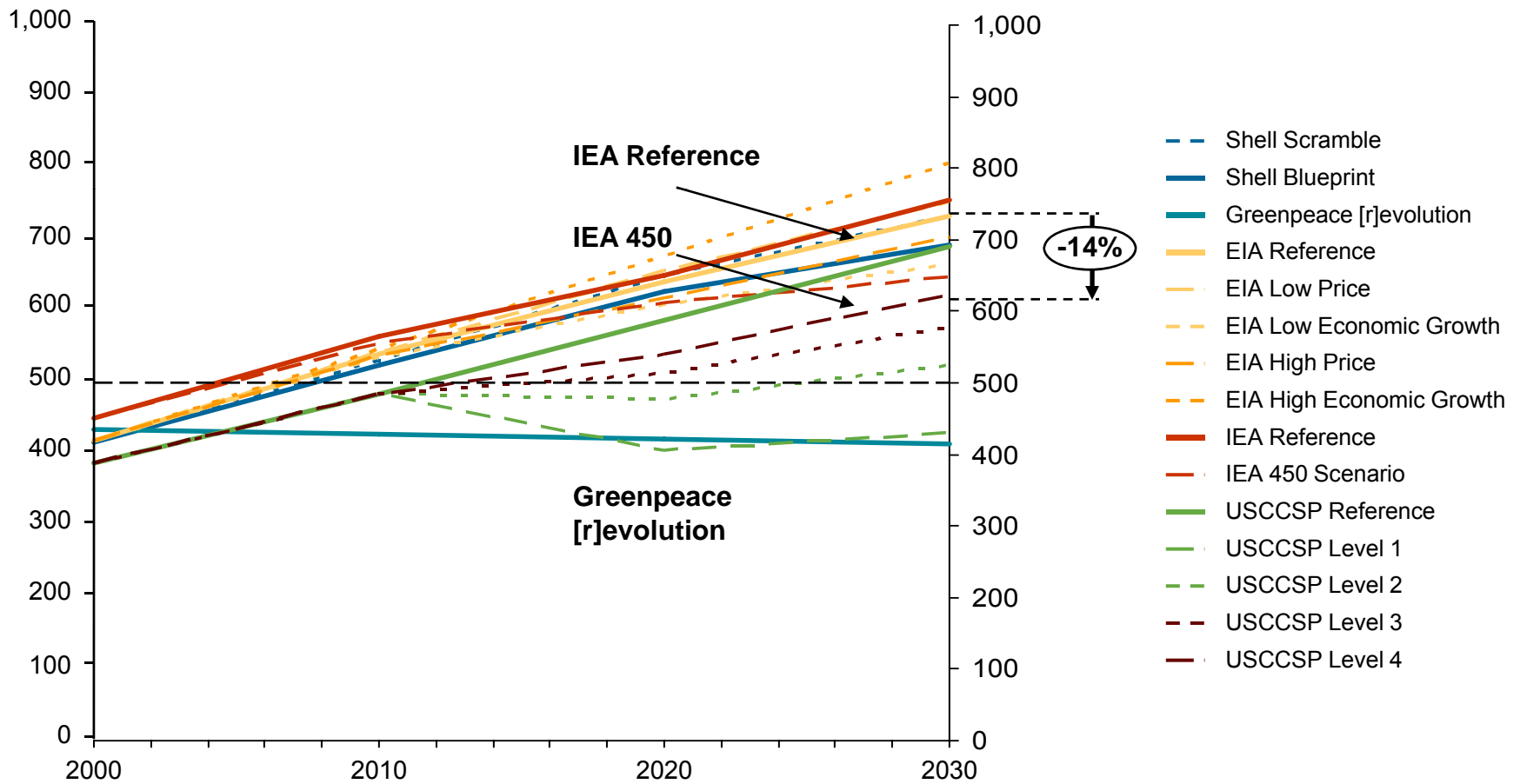
FT, 16/09/09

“Climategate: The Fallout Continues from CRU Hacking”

WSJ, 30/11/09

“The sheer amount of uncertainty makes predicting the future difficult – everyone has an opinion”

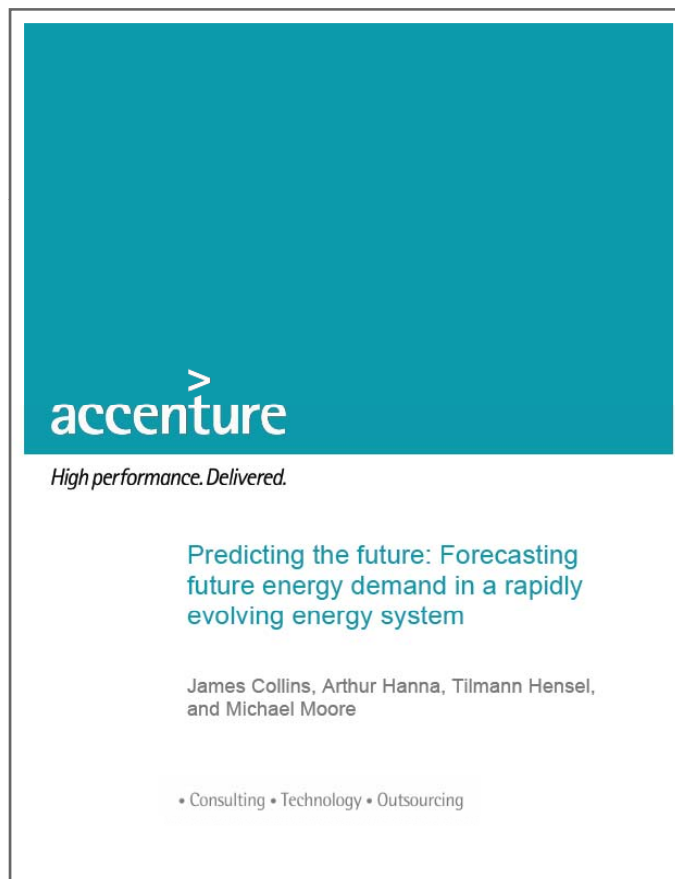
Total Primary Energy Demand (EJ/y)



Source: Accenture “Predicting the Future” study

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Accenture's "Predicting the Future" study helped us to understand the array of viewpoints of energy prognosticators



The report consists of three parts:

1. How future energy demand profiles differ—wide variation in demand forecasts
2. Why energy demand profiles are different—fundamental differences in structure and assumptions
3. The influence of organizational standpoint—where you stand depends on where you sit

As our study showed, industry paradigms will be influenced by a wide variety of factors - from environmental to economic to technological to political



Climate Change



Economic Growth



Consumers



Technology



Energy Security



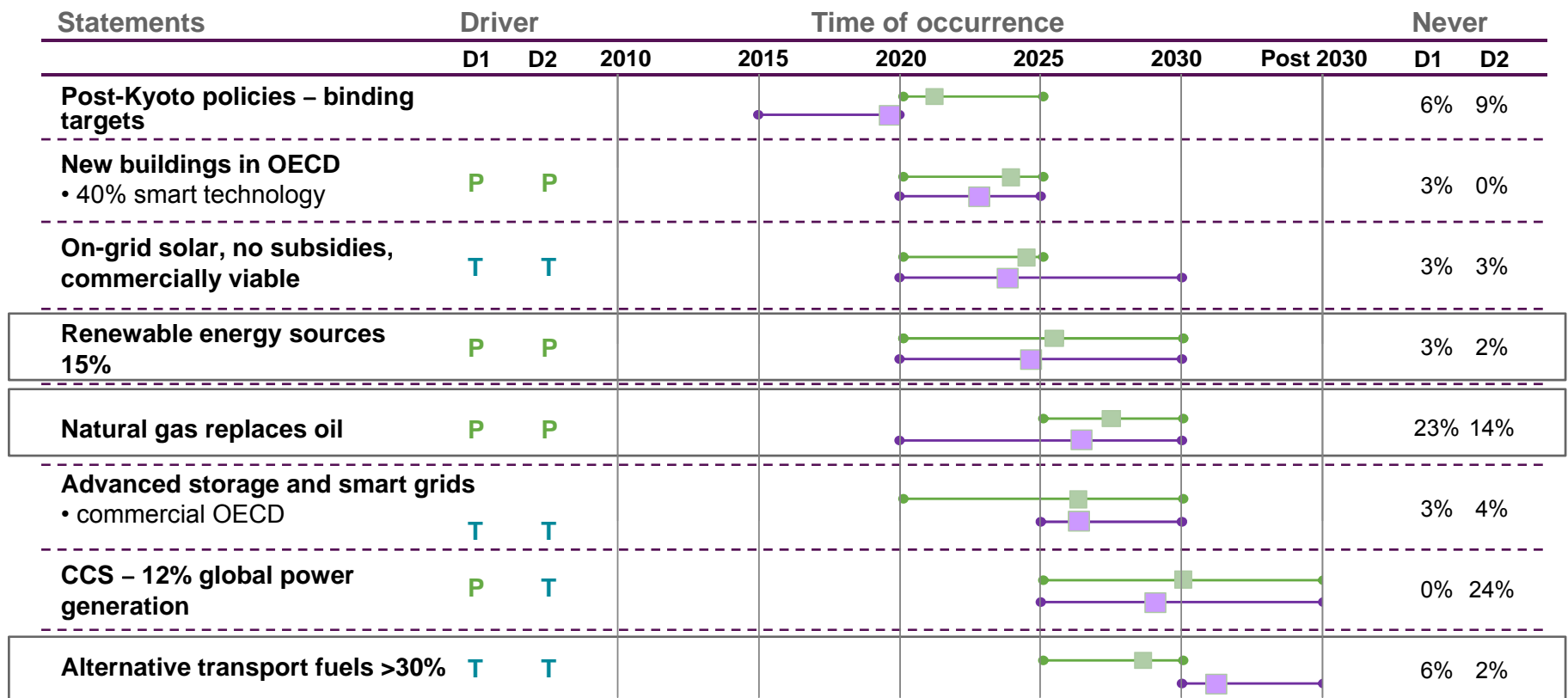
Policy

Key takeaway: the complexity of managing any response will be magnified

Accenture's Delphi study identified policy and regulation as one of the key accelerators of change in the energy industry

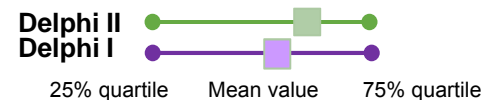


Comparison: Time of occurrence



P = Policy and regulation T = Technology innovation

*Does not include results for "2010"
Source: Accenture Delphi II study



Estimated timing? Experts expect major change to occur sooner than conventional reports predict

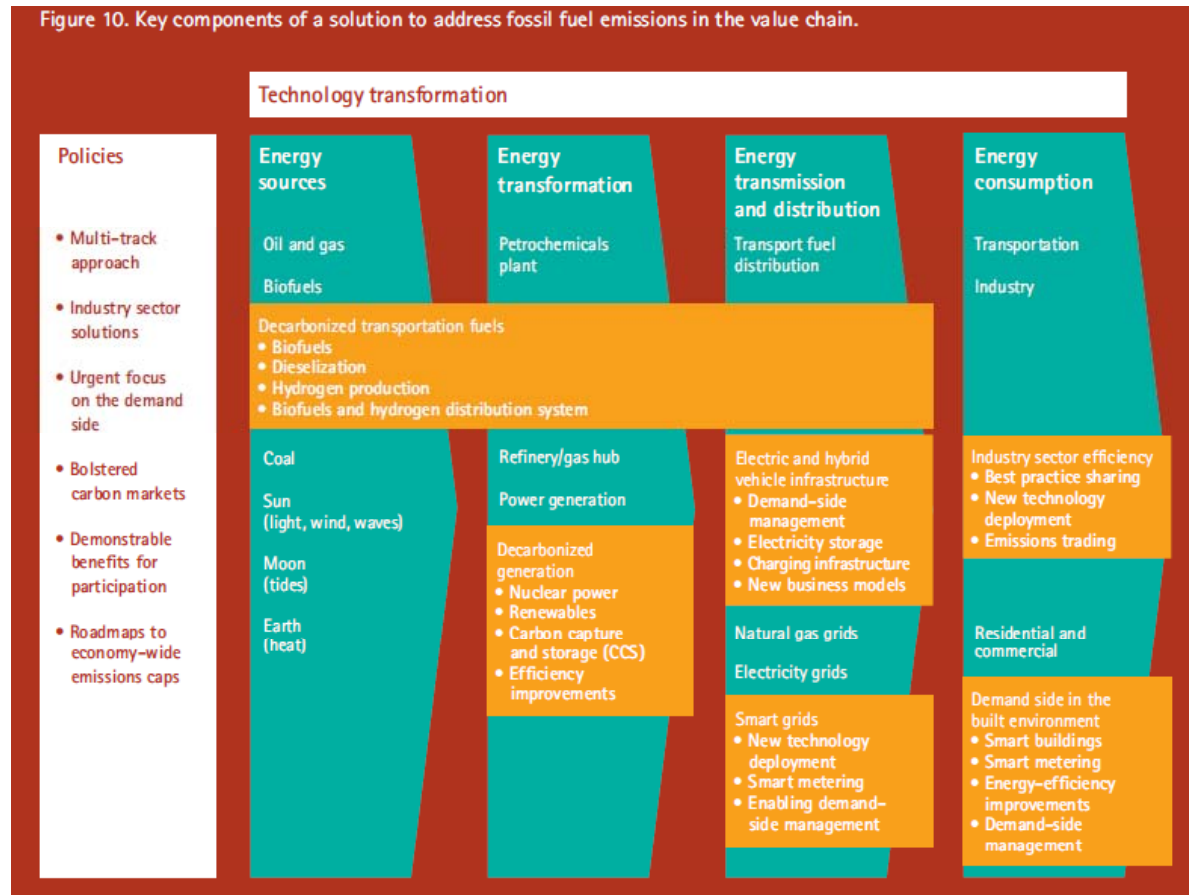


- Major changes in the energy sector will begin to occur post 2020
- Next 10 years (2010 to 2020) will be a transition period
- Changes will happen faster than conventional forecasts
- Energy policy will be an important driver

Paradigm shift 1: Copenhagen and beyond...managing returns around legislation rather than output efficiency



Figure 10. Key components of a solution to address fossil fuel emissions in the value chain.



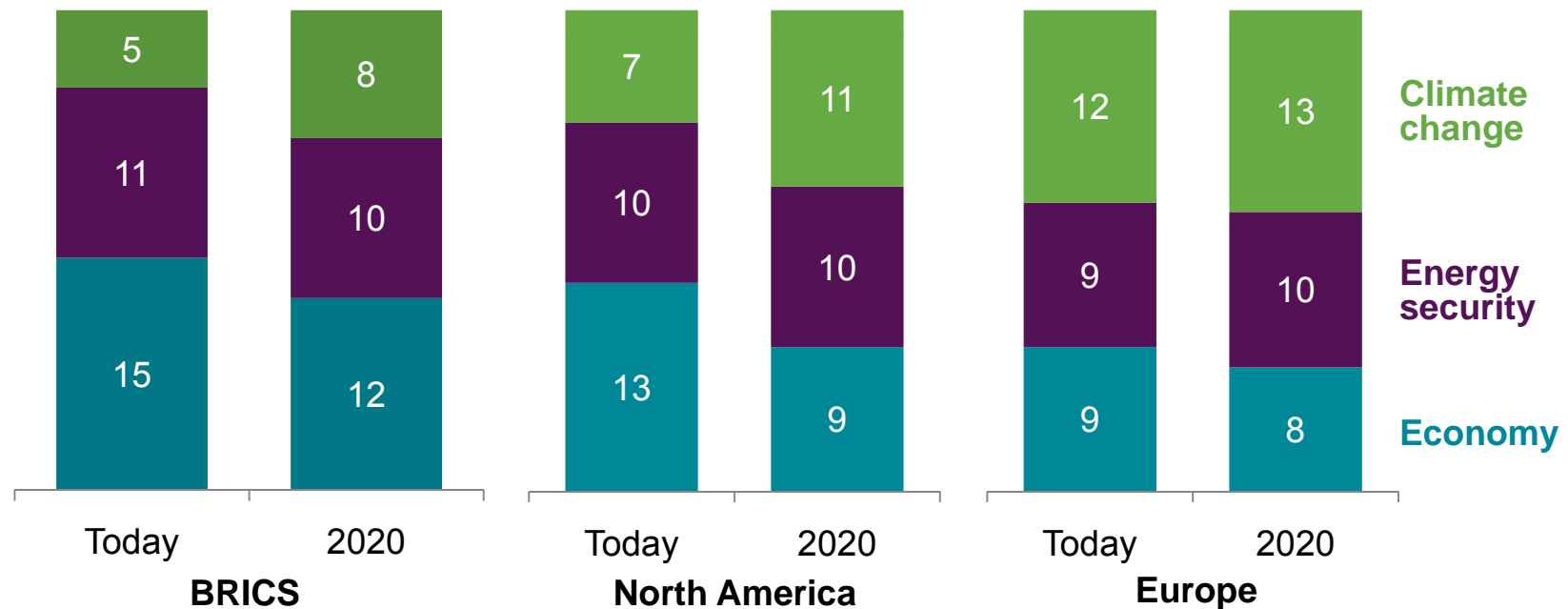
Source: Accenture study "To Copenhagen and Beyond: A pragmatic approach to mitigating climate change"

In all major regions, energy policy will be increasingly be driven by climate change...



In your opinion, which energy policy driver is the most important for policymakers in the following regions?

Mean values out of 30

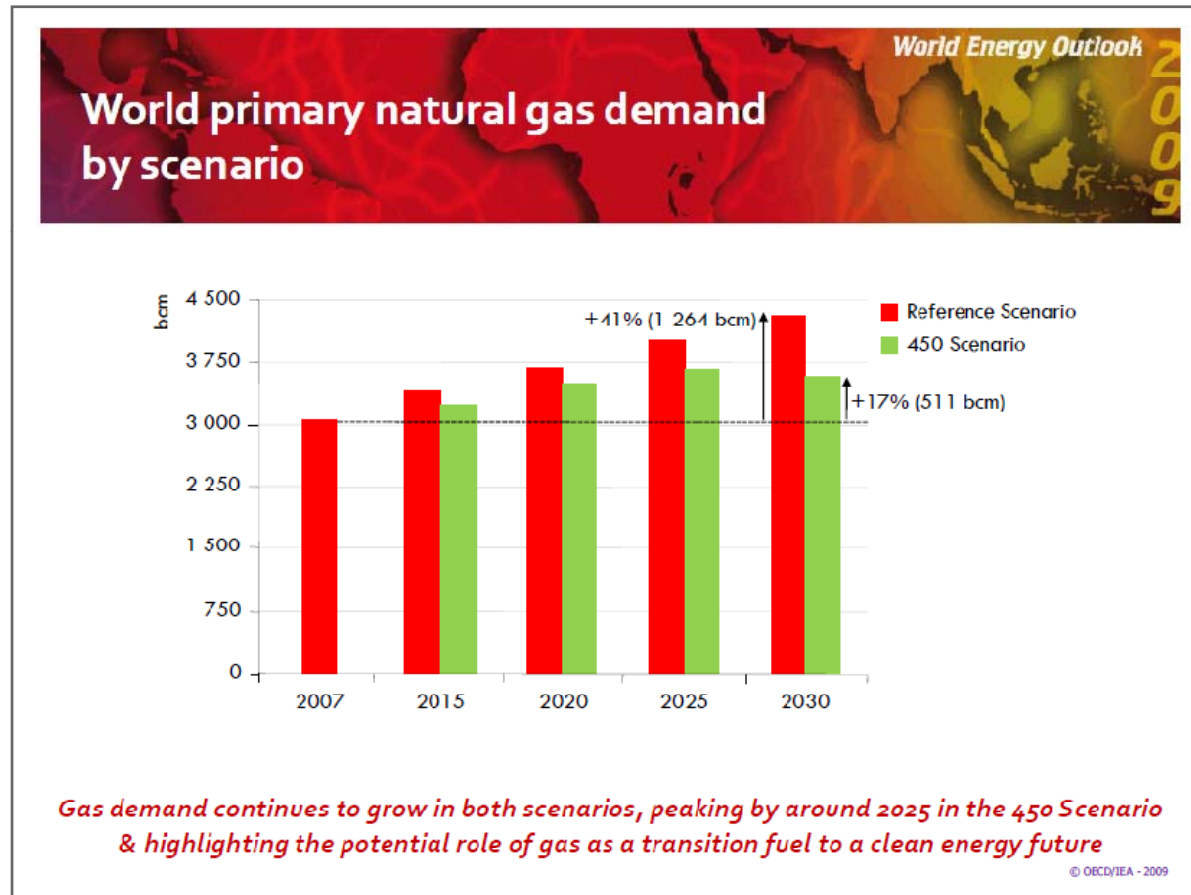


Allocate 30 points across the three drivers (where 0 points = driver not relevant, 30 points = driver is the only relevant factor)
 Due to rounding some columns may not add to 30

Source: Accenture Delphi II study

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Paradigm shift 2: The use of gas as a cleaner, primary oil substitute will increase as supply, delivery and price volatility concerns abate



Source: World Energy Outlook 2009, Press Presentation, 10 November 2009

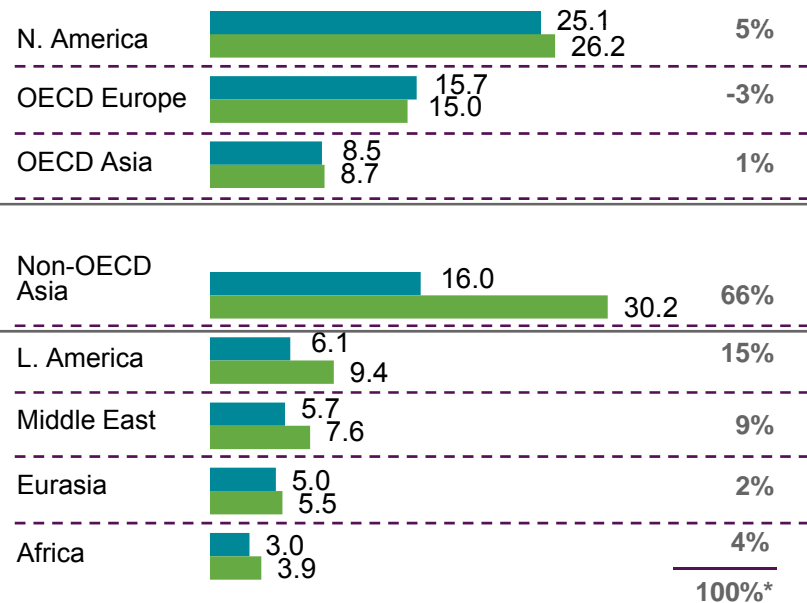
Paradigm shift 3: A multi-polar shift in demand and supply from developed toward emerging markets



Demand Side

■ 2006 ■ 2030

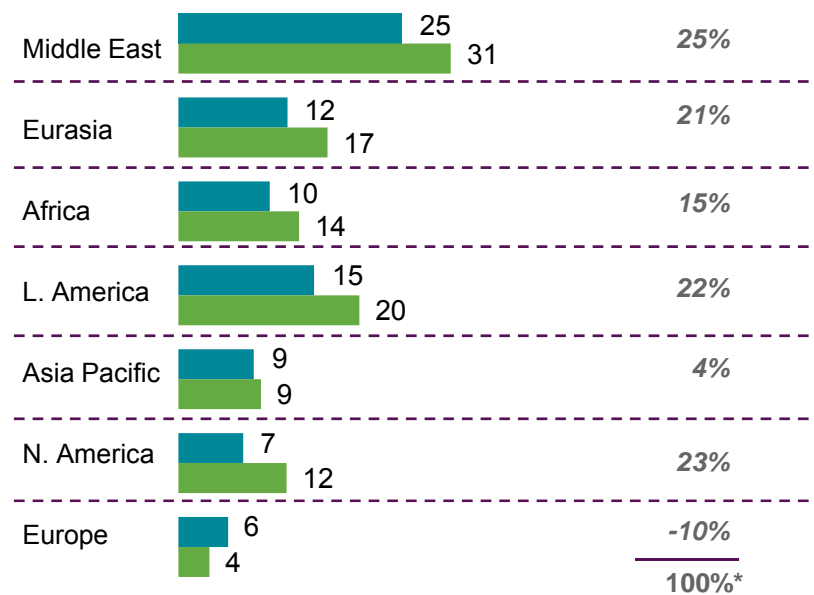
Projected liquids hydrocarbon consumption growth, by region (mmbbl/d) % share of growth



Supply Side

■ 2006 ■ 2030

Projected liquids production growth, by region (mmbbl/d) % share of growth



Asia drives over two thirds of demand growth to 2030, while production based in a wide variety of emerging economies will play an increasing role in meeting global demand

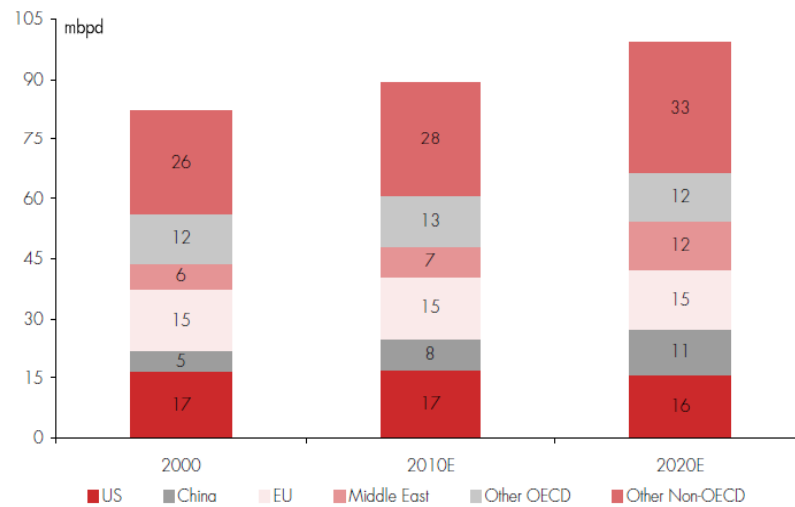
Source: EIA, Accenture analysis

* May not sum to 100% due to rounding and negative values

Paradigm shift 4: Refining will undergo a significant geographical and product shift



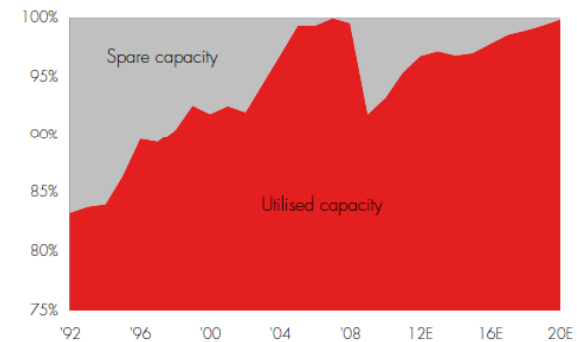
Figure 30: Global refining capacity by region



Source: BP Statistical Review, Nomura estimates

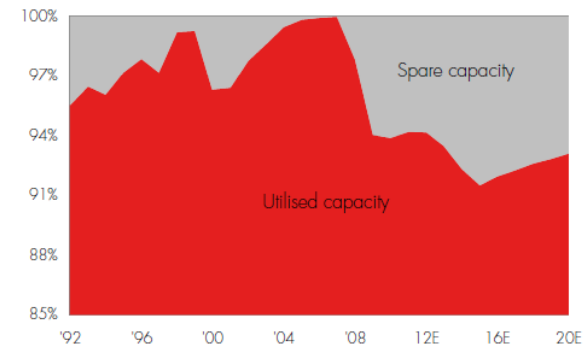
Sources: Nomura 2020 Vision; BP Statistical Review

Figure 31: Global refining diesel capacity utilisation



Source: BP Statistical Review, IEA, Nomura estimates

Figure 32: Global refining gasoline capacity utilisation



Source: BP Statistical Review, IEA, Nomura estimates

Paradigm shift 5: Delivering growth will require a shift in approach from “silo” to “JV ecosystem”



Significant recent JV announcements

Date	Parties	Description	Commodity
1 Feb 2010	Cosan, Shell	\$12 bn joint venture*	Biofuels
11 Dec 2009	Shell, Petronas	JV to develop 12.6 bn barrel Manjoon field in Iraq	Oil
5 Nov 2009	CNPC, Chevron	Jointly develop Luojiashai gasfield in Sichuan	Natural gas
3 Nov 2009	BP, CNPC	Invest \$15 bn in Iraq Rumaila field	Oil
7 Sep 2009	Petroecuador, PDVSA	Set up JV to operate Sacha oil field	Oil
2 Sep 2009	ONGC Videsh, IndianOil, Oil India Limited	Invest \$5 bn in Iran gas field	Natural gas

* Announced but not closed

** Includes: Rosneft Oil Co., Lukoil OAO, Gazprom OAO, TNK-BP and Surgutneftegaz

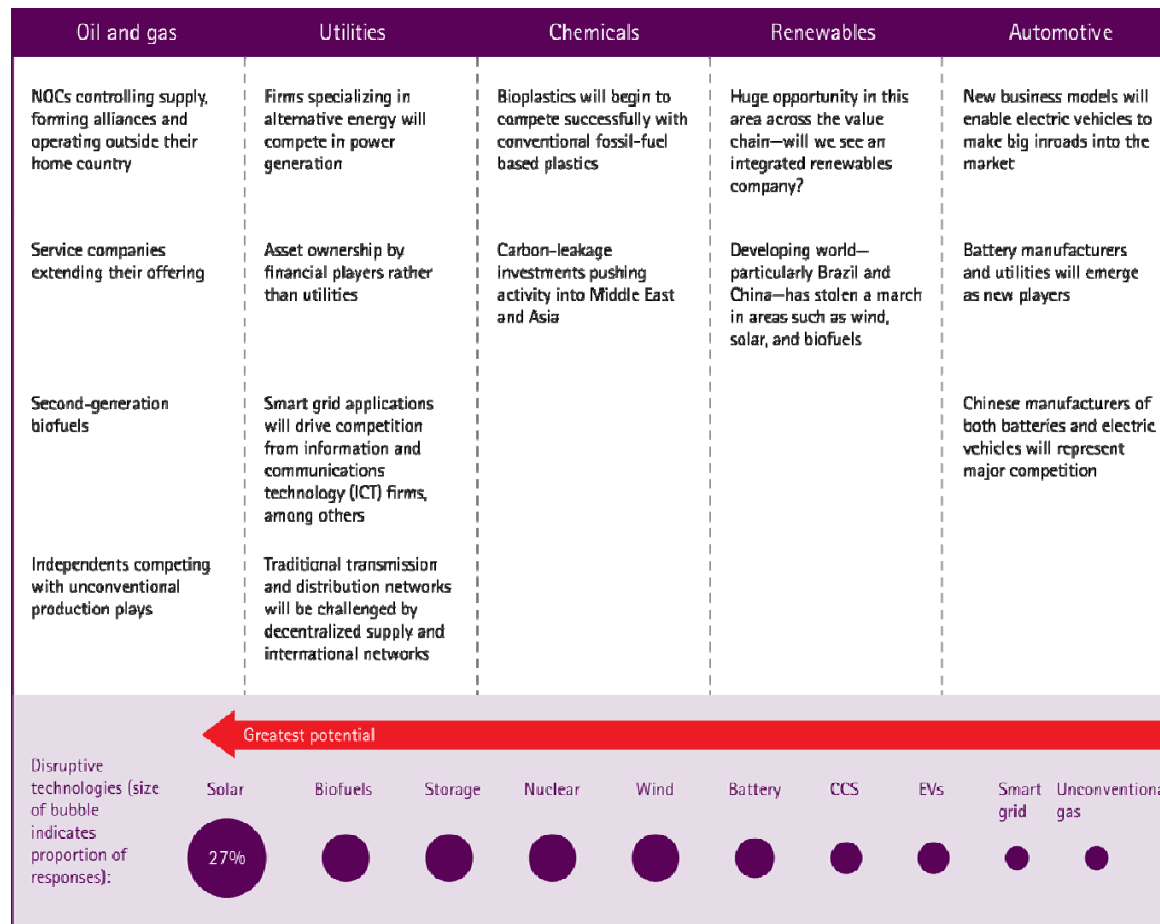
Please note - this data includes only Joint Venture deals that have involved a buyer and seller. Joint venture agreements that have occurred after the purchase of an asset are have not been included

Paradigm shift 5: Delivering growth will require a shift in approach from “silo” to “JV ecosystem”



- JVs formed to share costs and risks of major new field developments
 - Being used to bring NOC funding and political muscle together with technology and experience base of the IOCs
 - But also now proving just as common to bring NOCs together for international expansion
- Downstream IOCs accessing integration value without diverting funds from upstream
 - BP & Husky/Shell & Cosan
- Now seeing the emergence of more strategic multi-objective partnerships
 - e.g. Eni-Gazprom strategic alliance enables cooperation across the value chain: incl. gas market access and upstream assets in Russia and Libya
- Implications/Challenges:
 - Creation of a singular view of JV success to focus the combine organisations
 - Usual JV challenges of governance and day to day cooperation
 - Senior management to prevent wider strategic options aren't lost in the day to day pressures to get JV operational

The likely result of these paradigm shifts is a radically altered competitor set



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