

# A new era in global energy geo-politics?

From resource to technology dominance

Phil Summerton, Managing Director

# Outline

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- Context
  - why do energy resources play an important role in geopolitics?
  - what's driving the shift from resources to technology?
- What are the consequences of this transition?
  - in technology markets
  - in resource markets
  - for fossil fuel importers
  - for fossil fuel exporters
- What's the role for policy?

# Why do energy resources play an important role in geopolitics?

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1. As a society we have basic needs that require energy resources:

- a) warmth and comfort
- b) mobility
- c) electricity for appliances (ranging from the basic to the more sophisticated)



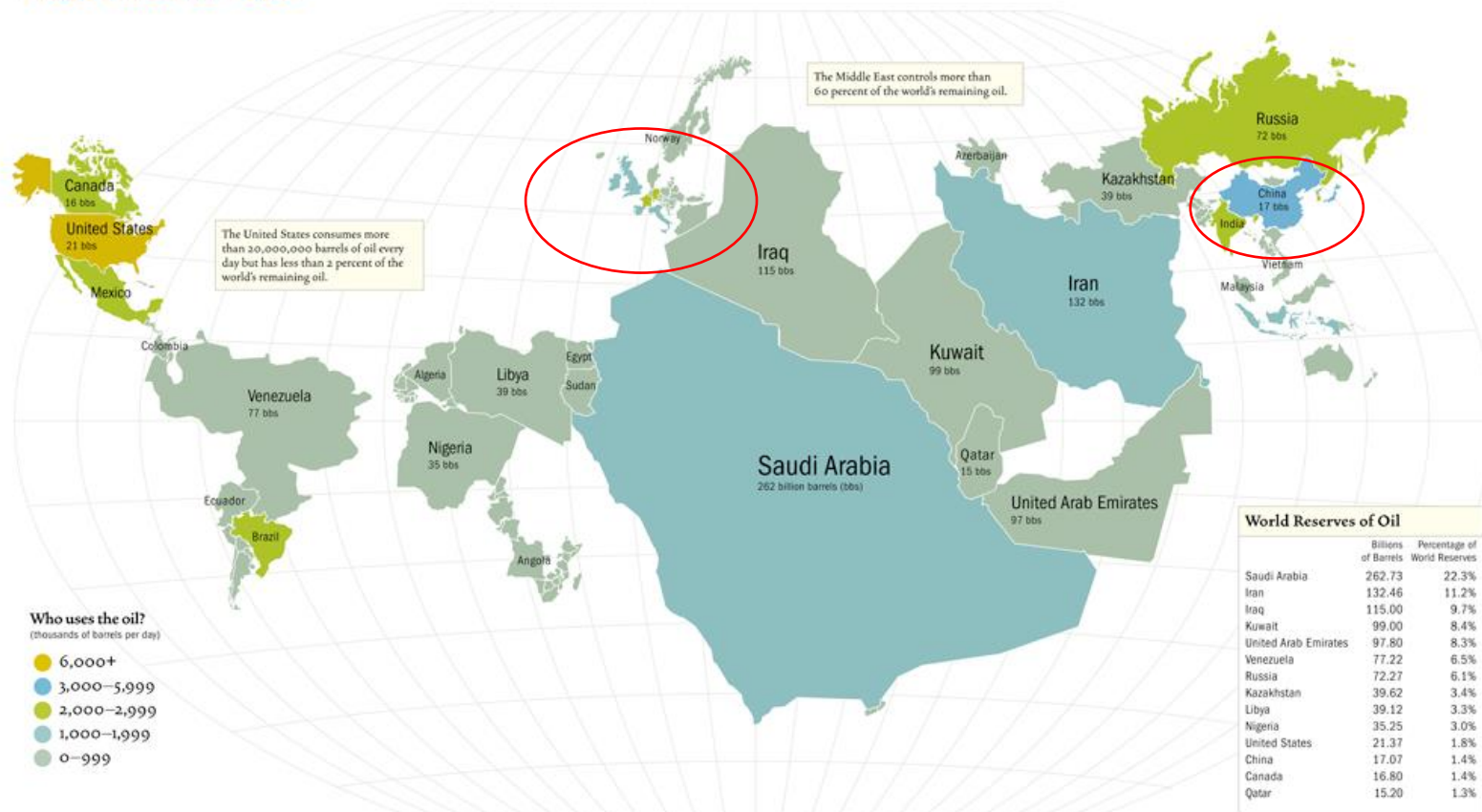
# Why do energy resources play an important role in geopolitics?

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  - b) mobility
  - c) electricity for appliances
2. Energy resources and the demand for those resources are not evenly distributed across countries

# Why do energy resources play an important role in geopolitics?

## Who has the oil?



Each country's size is proportional to the amount of oil it contains (oil reserves). Source: BP Statistical Review Year-End 2004 & Energy Information Administration

# Why do energy resources play an important role in geopolitics?

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2. Energy resources, and the demand for those resources, are not evenly distributed across countries
3. At any point in time, the capital stock in an economy locks society to using specific resources to meet societies basic needs

# What's driving the transition from resources to technology?

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## 1. Climate change policy

- a) renewable energy policy
- b) energy efficiency policy
- c) electrification of transport and heating

Decarbonisation pathways all lead to:

- increase in capital investment (technology)
- decrease in fossil fuel consumption (resource)

# What's driving the transition from resources to technology?

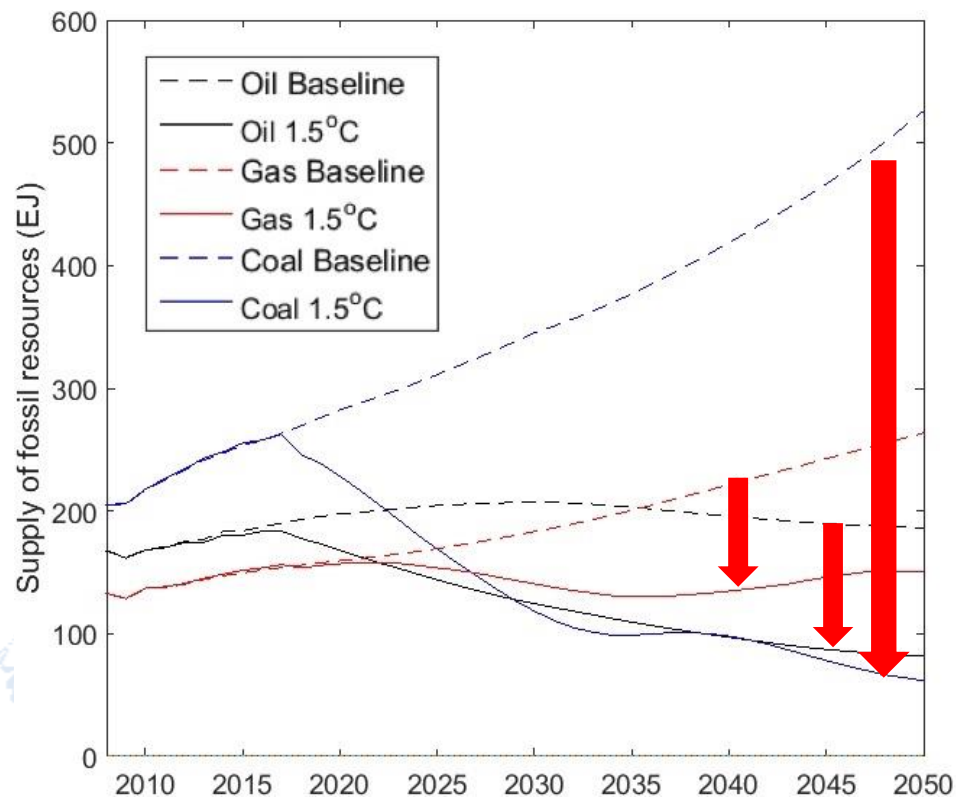
## World: Current Policies and 450 Scenarios

	Energy demand (Mtoe)						Shares (%)		CAAGR (%)	
	2020	2030	2040	2020	2030	2040	2040		2013-2040	
	Current Policies Scenario			450 Scenario			CPS	450	CPS	450
<b>TPED</b>	<b>15 041</b>	<b>17 345</b>	<b>19 643</b>	<b>14 308</b>	<b>14 673</b>	<b>15 197</b>	<b>100</b>	<b>100</b>	<b>1.4</b>	<b>0.4</b>
Coal	4 228	4 941	5 618	3 752	2 889	2 495	29	16	1.3	-1.7
Oil	4 539	4 942	5 348	4 356	3 934	3 351	27	22	0.9	-0.8
Gas	3 233	3 878	4 610	3 112	3 349	3 335	23	22	1.7	0.5
Nuclear	827	959	1 036	839	1 267	1 627	5	11	1.8	3.5
Hydro	380	449	507	384	490	588	3	4	1.7	2.2
Bioenergy	1 537	1 702	1 830	1 532	1 933	2 331	9	15	1.1	2.0
Other renewables	296	474	693	332	811	1 470	4	10	5.6	8.5

Source: IEA, World Energy Outlook, 2015.



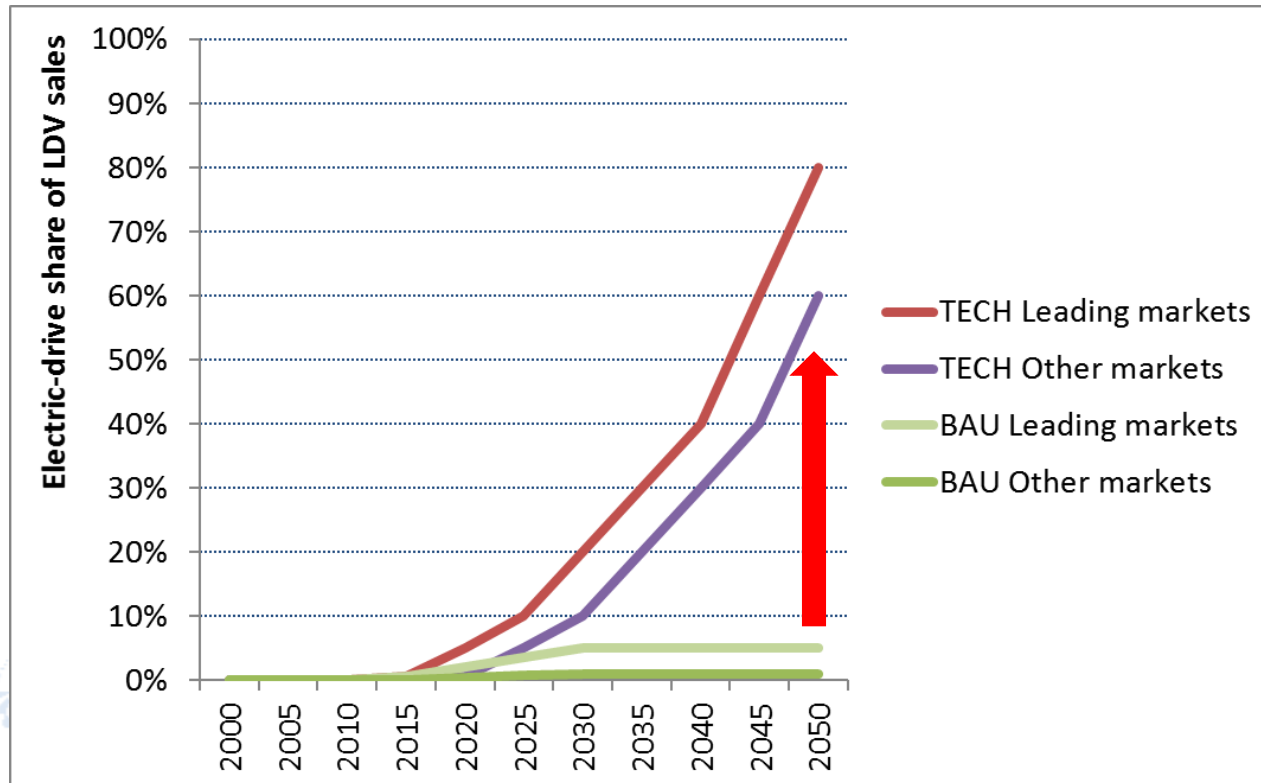
# What's driving the transition from resources to technology?



Source: Mercure et al. 2016 (forthcoming)

“The costs of stranded assets in fast decarbonisation scenarios”

# What's driving the transition from resources to technology?



Source: Cambridge Econometrics, et al, 2016, "Oil Market Futures"

# What's driving the transition from resources to technology?

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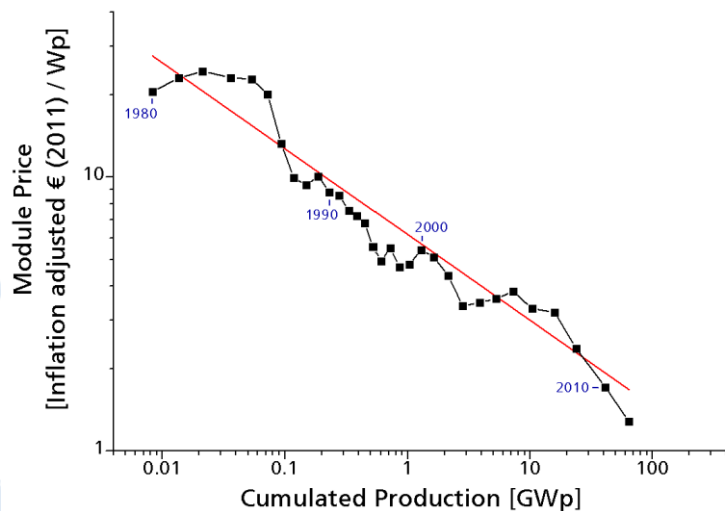
## 2. Energy security policy

- a) political sense of over-reliance on trading partners to meet these basic societal needs

# What are the consequences of the transition?

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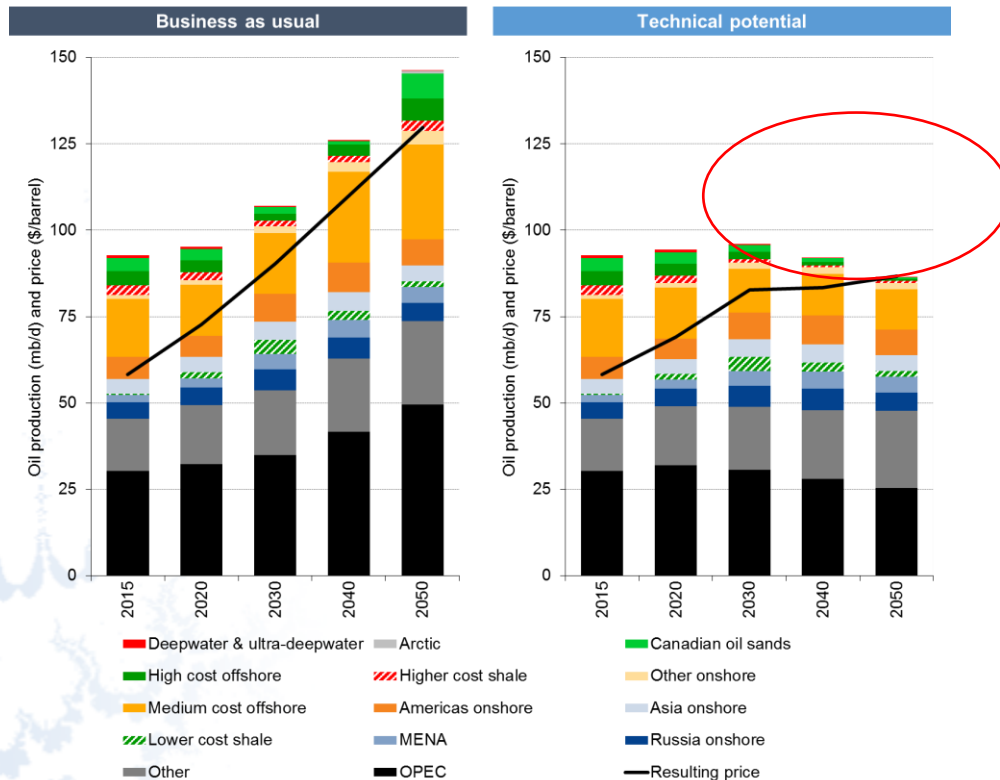
- History (and economics) suggests that increasing demand for scarce resources leads to increasing costs
- In stark contrast, increasing demand for new technology tends to reduce the cost



Solar PV module price learning curve in Germany, 1980-2012  
Source: Fraunhofer ISE, 2012

# What are the consequences of the transition?

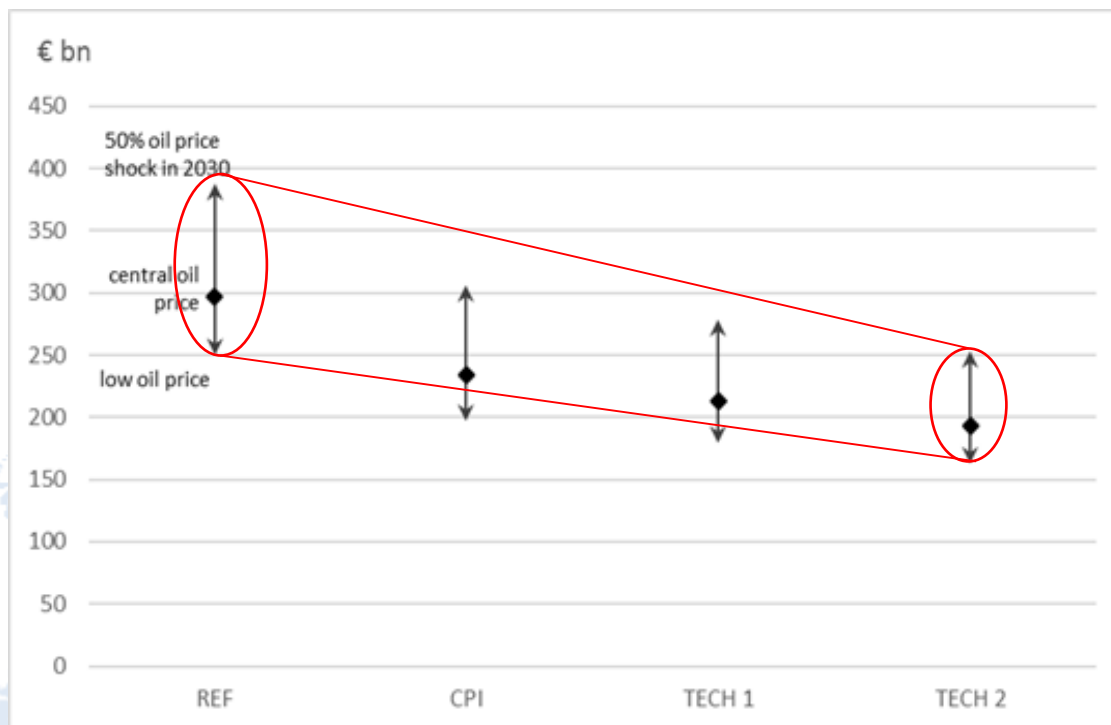
- Lower demand for fossil fuels will lead to lower fossil fuel prices



Global oil production and price  
Source: Cambridge Econometrics et al,  
2016 "Oil Market Futures"

# What are the consequences of the transition?

- As economies consume less fossil fuels they become more resilient to supply shocks



European expenditure on oil in passenger cars in 2030

Source: Cambridge Econometrics, 2015

# What are the consequences of the transition?

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- Fossil fuel exporters face lower revenues as a result of:
  - lower demand for fossil fuels
  - the lower price of fossil fuels
- As economies reduce fossil fuel consumption they become more resilient to supply shocks
- Fossil fuels are cheaper for those parts of the economy (or other economies) that face greater challenges in switching to technologies
- There is a change in the negotiating position (bargaining power) in favour of fossil fuel importing countries

# What's the role for policy?

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- There is a good rationale for public policy to support private sector investment in emerging energy technologies
  - provision of 'positive externalities' beyond decarbonisation
    - resilience to fossil fuel supply shocks
    - increased bargaining power in geo-political negotiation
    - lower fossil fuel prices where fossil fuels are still necessary
  - private sector investment is well-understood in traditional resource extraction models
    - tested business models (although possibly now breaking...)
    - business as usual – markets designed to facilitate
  - private sector investment in new technologies is much riskier
    - some new technologies will fail
    - the balance of risk falls on the private sector but many of the benefits are societal



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