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China's Five Year Plan and Low Carbon Industrialisation

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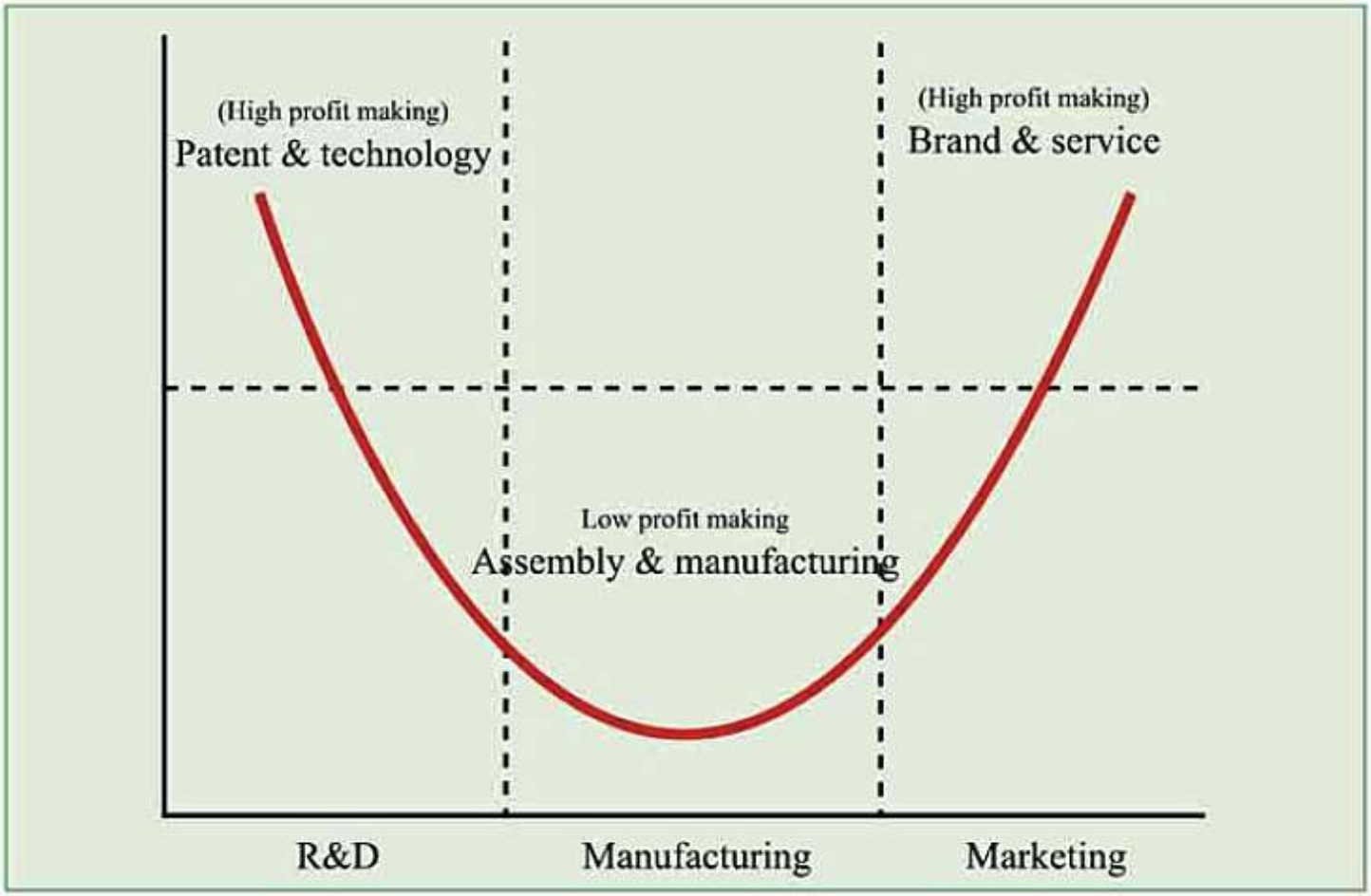
Rationale for low carbon growth in China

- **Low carbon growth will help address concerns over energy and resource security (access and affordability). China currently imports some 5% of its coal but this already amounts to nearly the sum total of Australian coal exports. There will be resource constraints on China's future growth, from energy, minerals to water. Low carbon growth help lower import dependence and avoid the inflationary impact of importing high international prices.**

- **There is strong awareness – at a high political level - of potential climate impacts on China – reduced crop yields through water-stress and extreme weather – since the national assessment in 2006.**

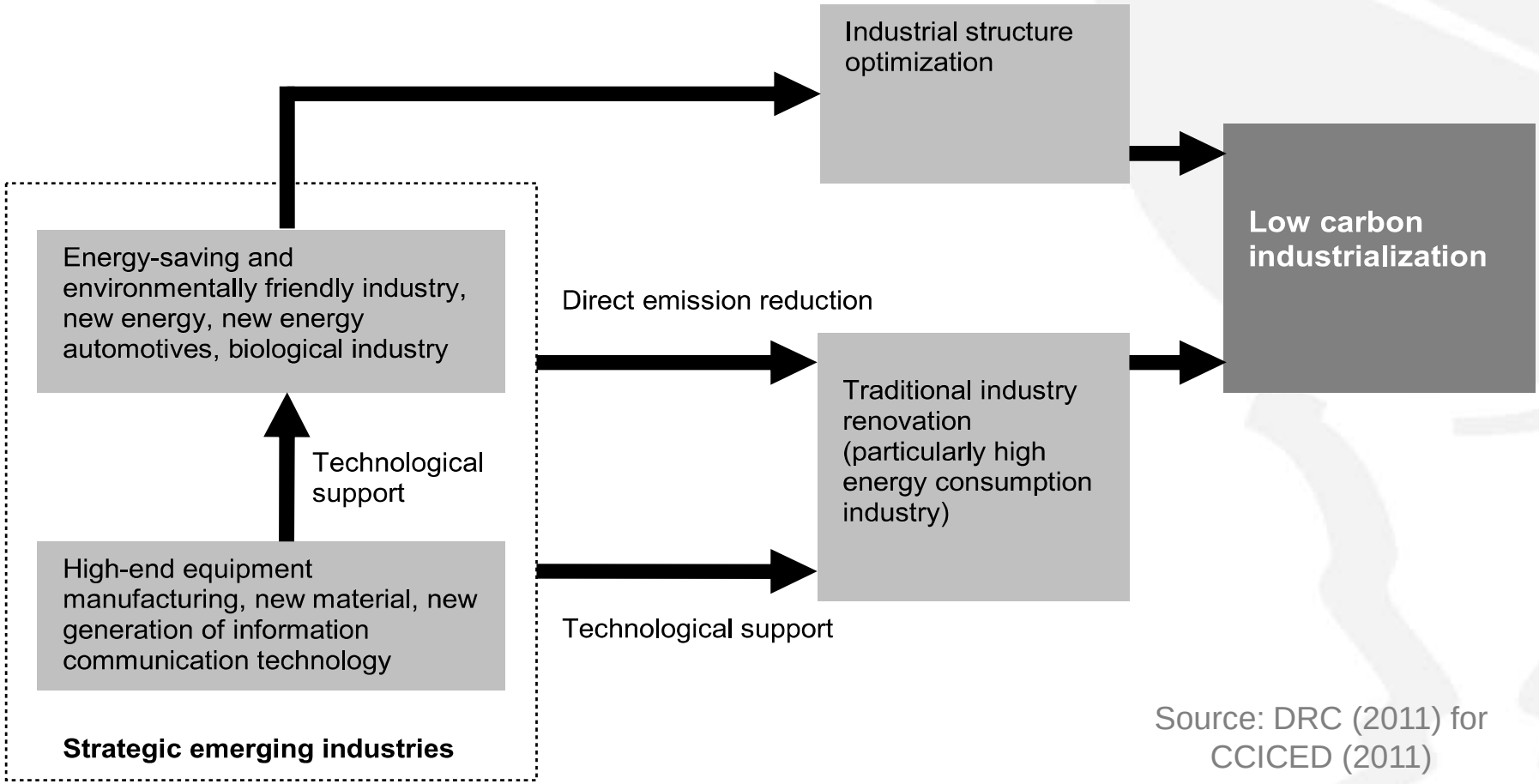
- **International economic structures and trading conditions are changing in response to energy and resource constraints. Low carbon development strategies help reinforce the twin goals of (a) reducing dependence on exports of heavy energy-intensive goods and (2) becoming a market leader in higher value-added technology as well as information-based goods and services.**

The Chinese ‘smile’ – moving up the value chain



In 2007, the added value rate in China’s manufacturing sector was 26.5%, far below the average level of 35% in developed countries, especially the US where it is 45.9%.

Low carbon industrialization is a central piece of the strategy

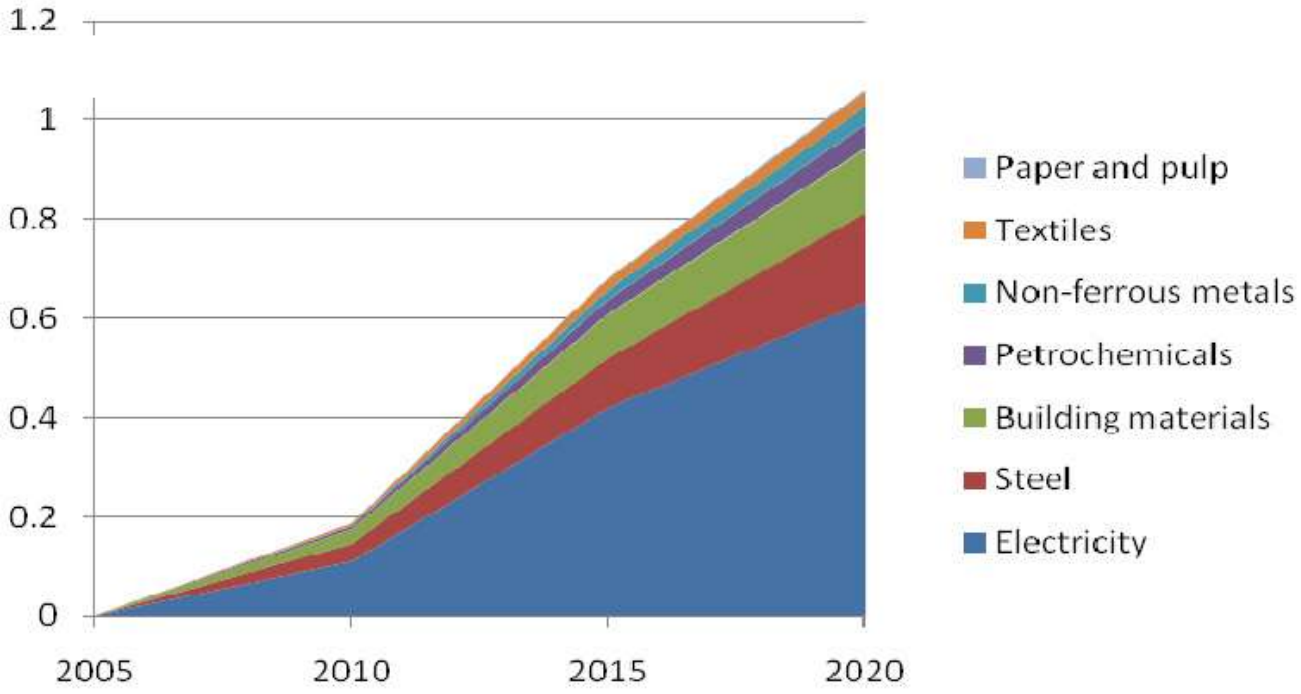


Source: DRC (2011) for CCICED (2011)

The strategic emerging industries are planned to become the backbone of the national economy, constituting 8% of GDP by 2015 and 15% by 2020

Tackling emissions from heavy industries is a start

The potential impact of 79 kinds of industrial energy conservation technologies on China's CO_2 emissions (2006–20 in $GtCO_2$)



Source: LCIS Task Force analysis

New pillar industries can both enhance value-addition *and* help reduce emissions

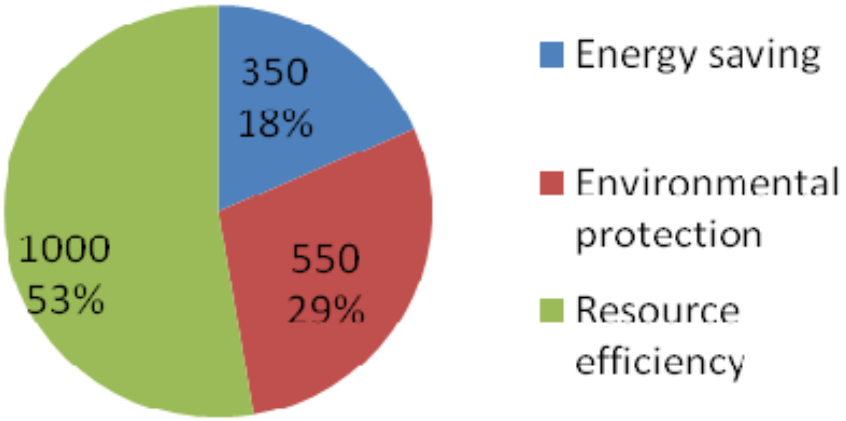
Impact of emerging industries on CO_2 emissions

	CO_2 emissions avoided		Note
	2015	2020	
Energy-saving and environmental protection	818 Mt	1.9 Gt	Direct effect
New energy	1.2 Gt	1.8 Gt	Direct effect
New energy vehicles		300 Mt	Logistics and transportation
Biological industry	Can replace oil and gas as feedstocks and fuels		Direct effect
Information Communication industry	615 Mt of emissions will be reduced by 2020 and the ratio of direct to indirect emissions reduction is 1:5		The ratio of direct to indirect emissions reduction is 1:5
New materials	Will have an important impact on resource-saving, environmental treatment, material recycling and reutilization		Indirect effect
High-end manufacturing industry			

Source: LCIS Task Force

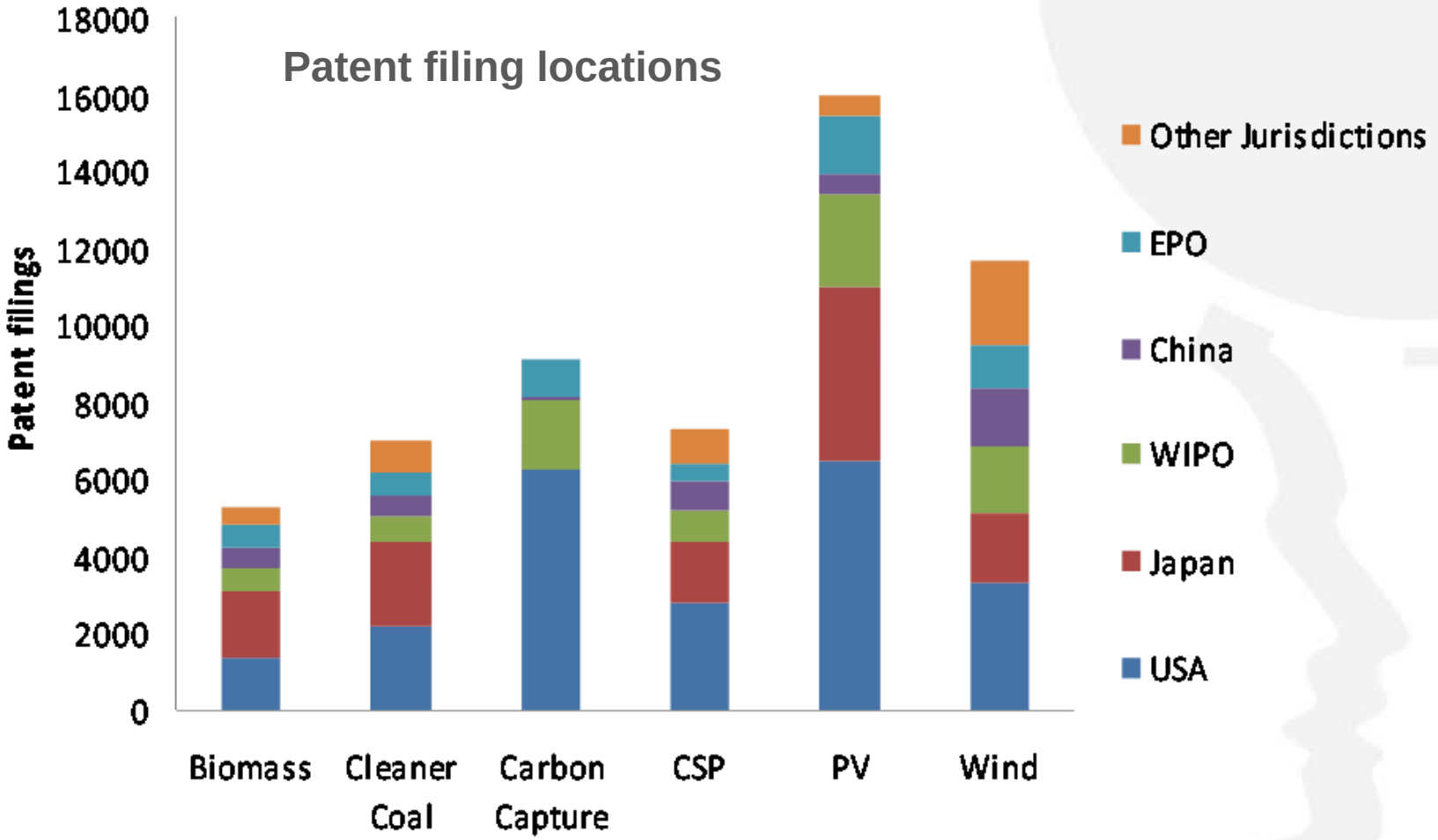
Energy saving and environmental protection sectors are becoming significant growth-drivers of the economy. There has also been large increases in R&D spending in this and other areas

Breakdown of energy-saving and environmental protection sector in 2009 (RMB bn)



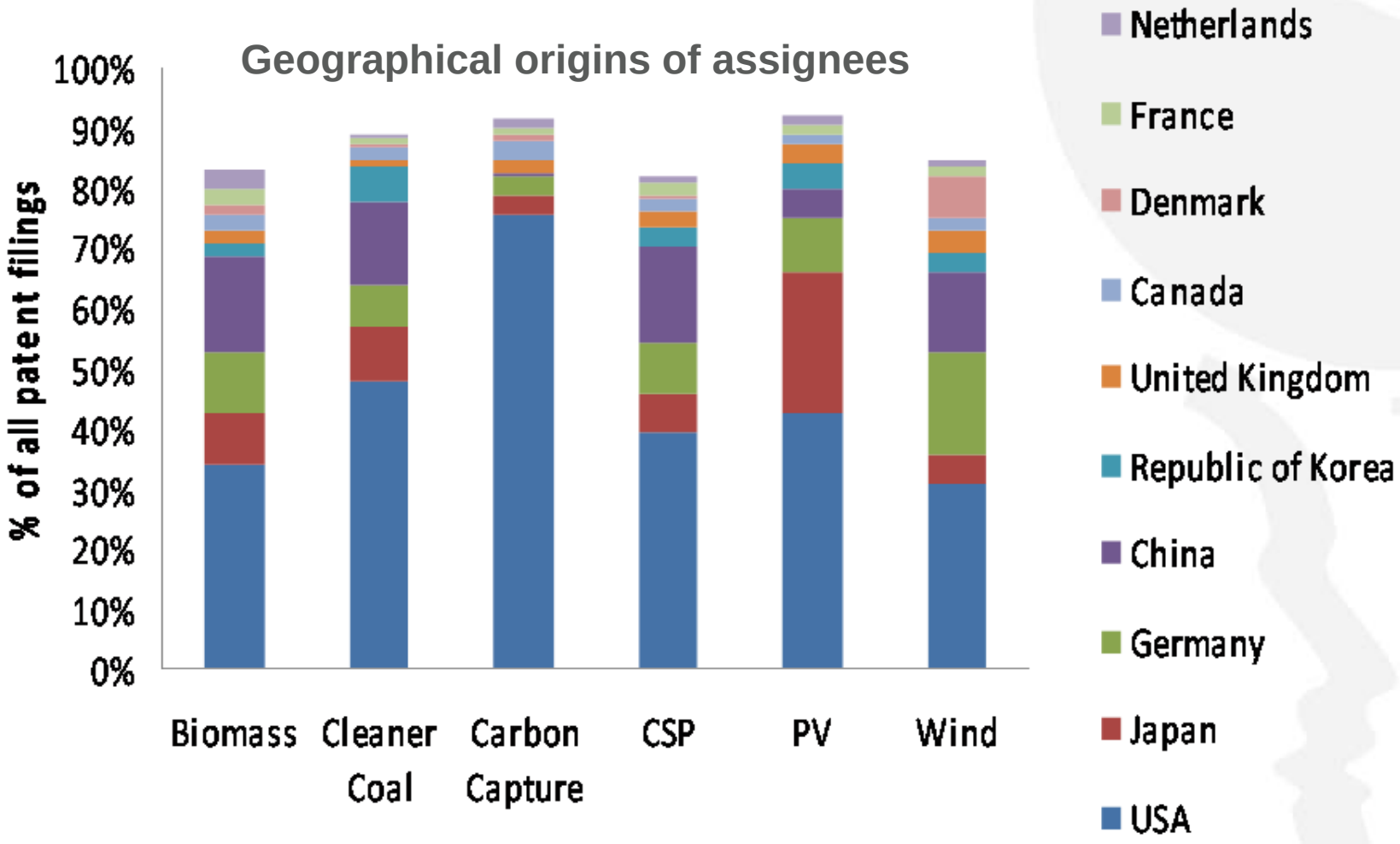
Source: LCIS Task Force analysis of industry sources[37]

China is increasingly popular as a destination for patent filing - indicating intention to invest, sell or license. Not surprising given of the size of the potential markets.



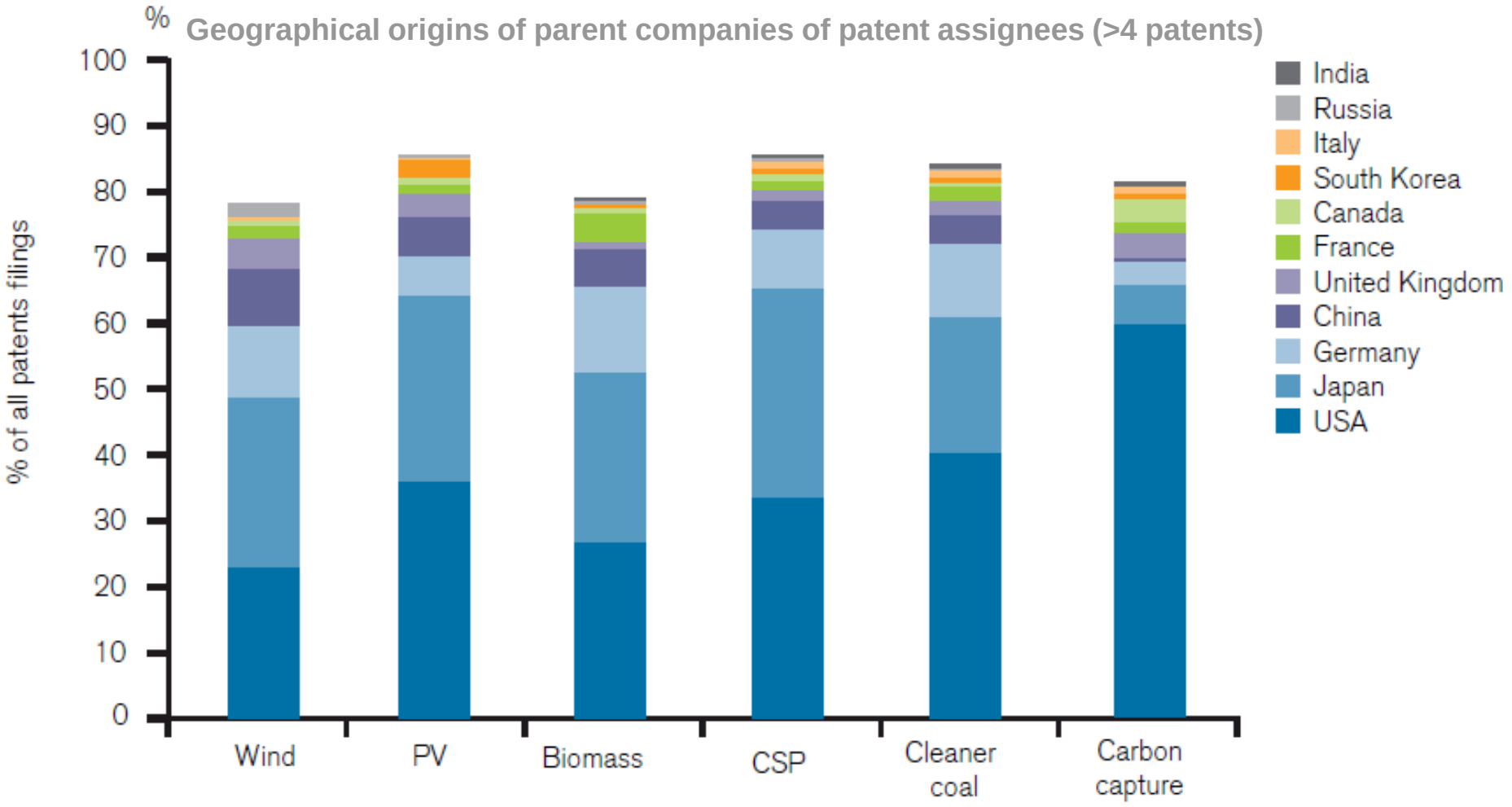
Source: Chatham House (2009)

Where do these inventions come from?



Source: Chatham House (2009)

Innovation is still dominated by OECD actors, who will determine the diffusion speed of the most advanced energy technologies in the next decade.



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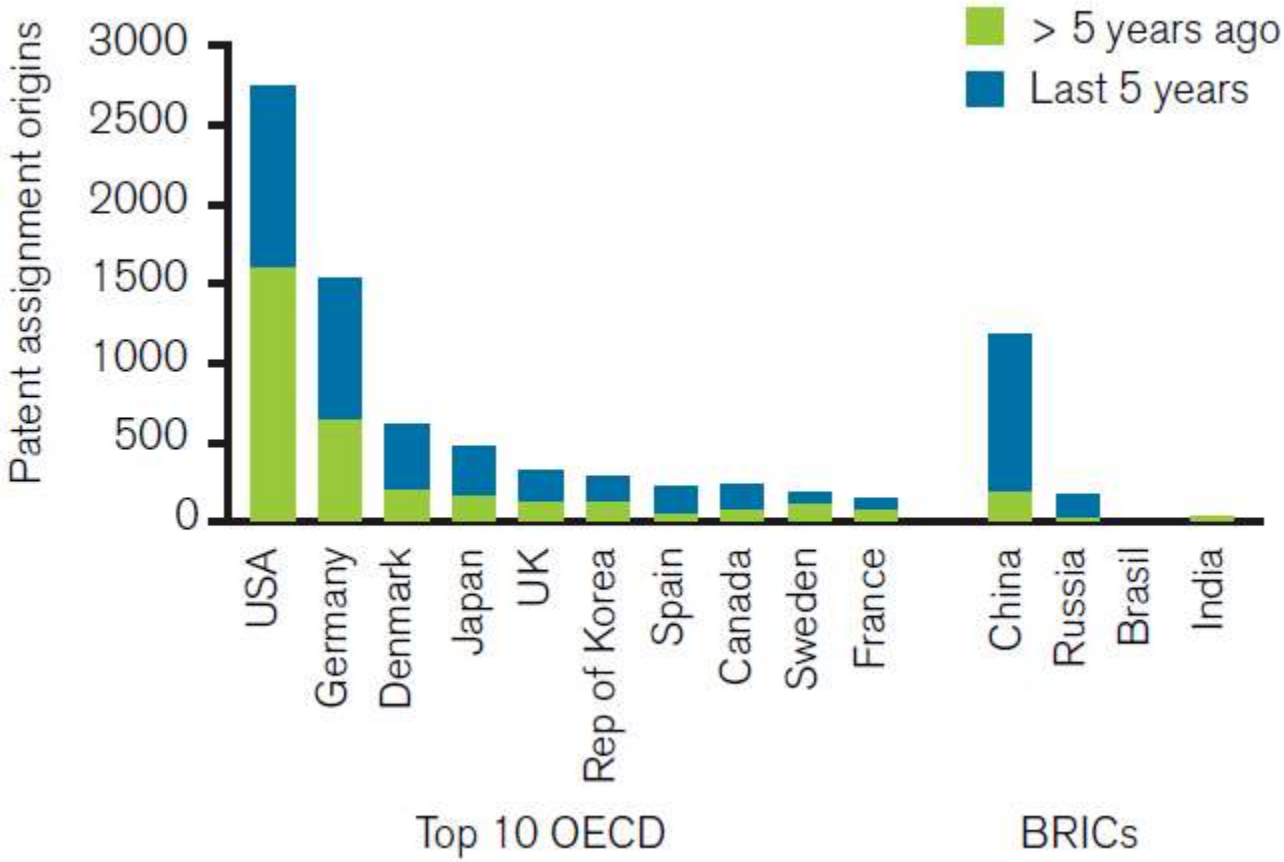
Source: Chatham House (2009)

But China is fast catching up… Wind is a good example.

Wind patents – assignee origin



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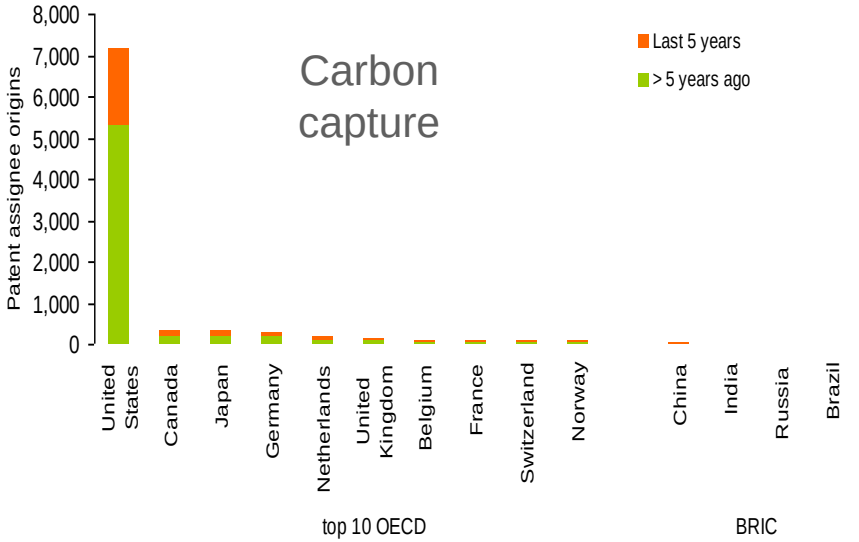
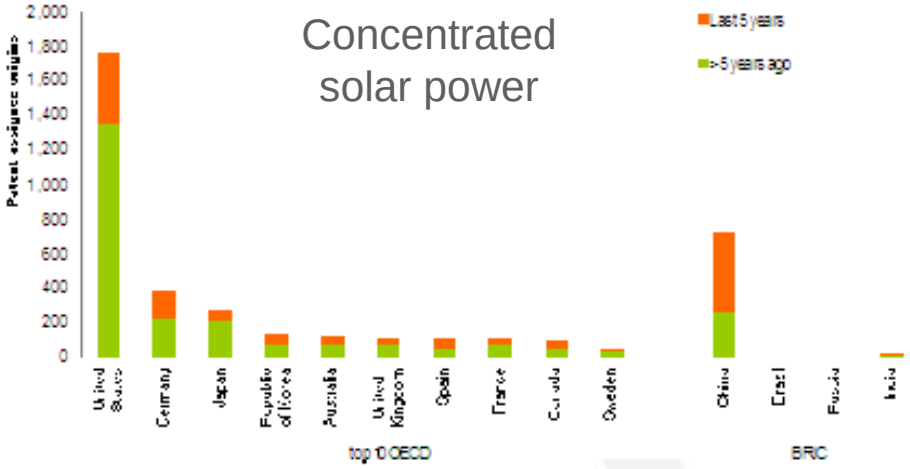
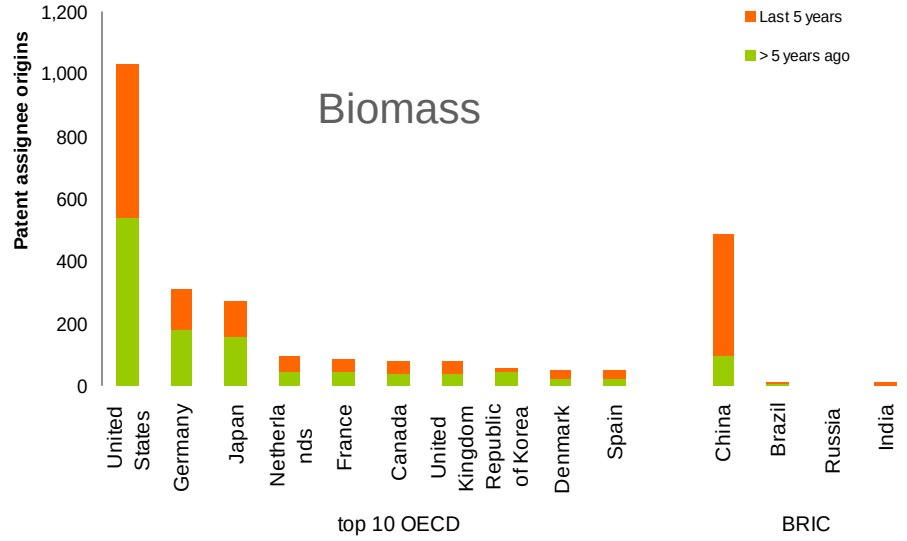
Source: Chatham House (2009)

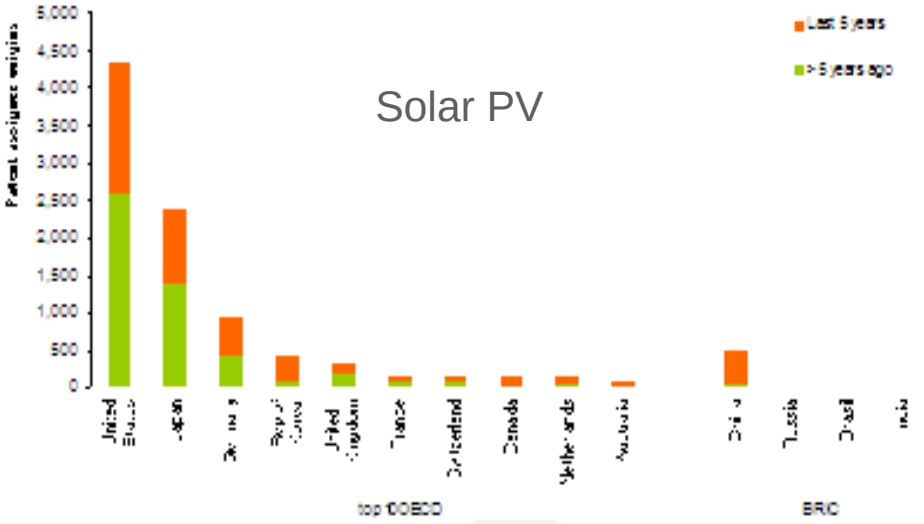
And this pattern is replicated across many technologies, other than carbon capture

Source: Chatham House (2009)

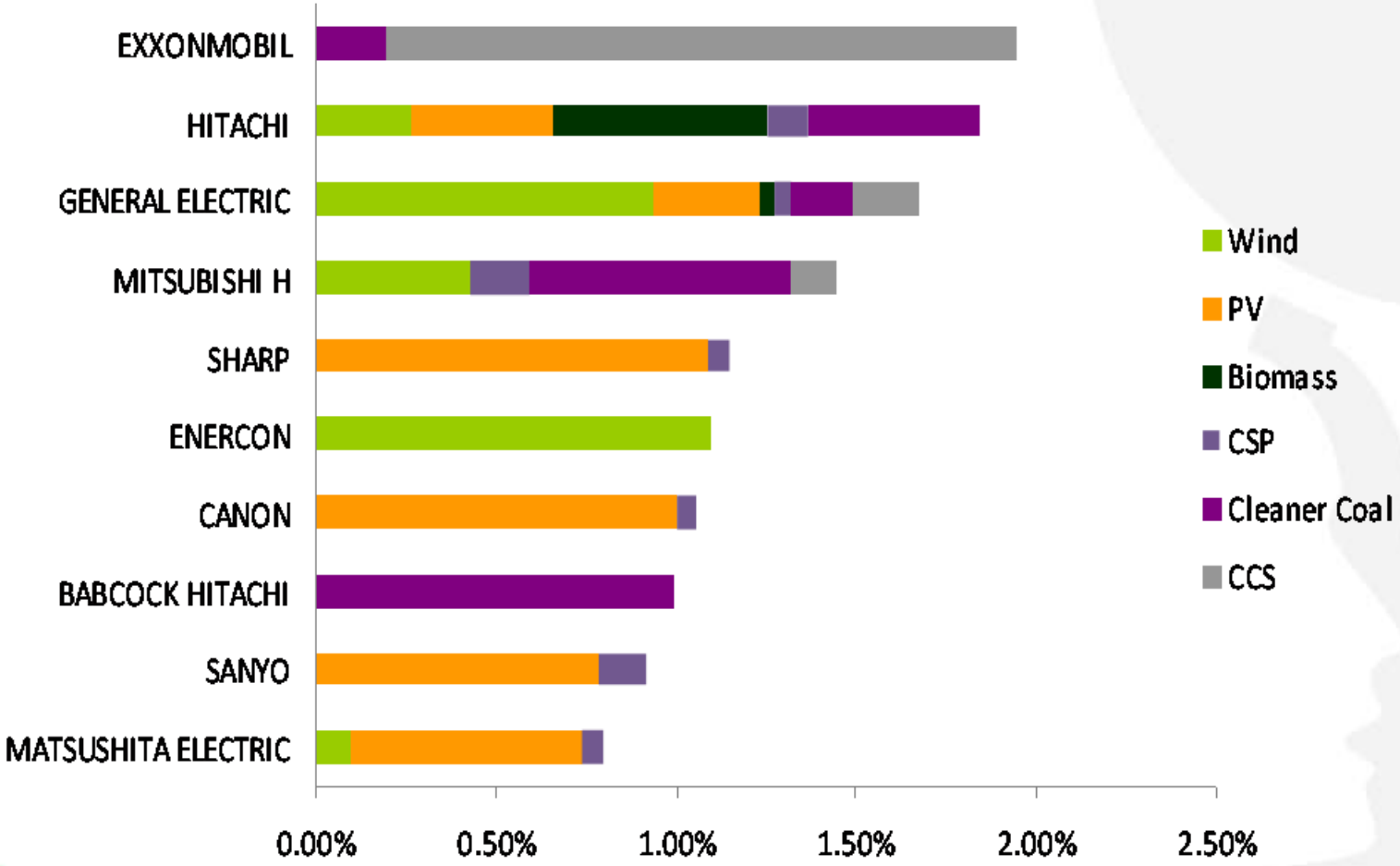








Utilising high carbon assets in a strategic manner remains challenging. Innovation does not always follow the boundary of specific economic sectors. High-carbon companies control some of the key knowledge assets needed for the low carbon economy.



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Source: Chatham House (2009)

Conclusions: Balancing the competitive and cooperative inertia

- In 2005, China became the third largest R&D spender worldwide (in purchasing power parity terms), after the United States and Japan. Firms in emerging economies are also increasingly investing in developed countries. A recent study showed that Chinese firms alone set up 37 R&D units abroad, of which 26 are based in developed countries (11 in the United States and 11 in the EU).
- It is early days to say who will necessarily win the low carbon technology race. China's manufacturing prowess is generating adaptive knowledge but innovation is a different matter.
- What does China want?? Investment, technologies and market access. In a world where there is no obvious store of value, its ability to secure long term and stable investment for its hard earned cash is key.
- Early movers can create new markets for the future – sustainability is the future given the competing resources and other needs. Most trading nations will lose out in a protectionist, inward-looking and defensive world.