

CleanTech Investments: The Future of Industry

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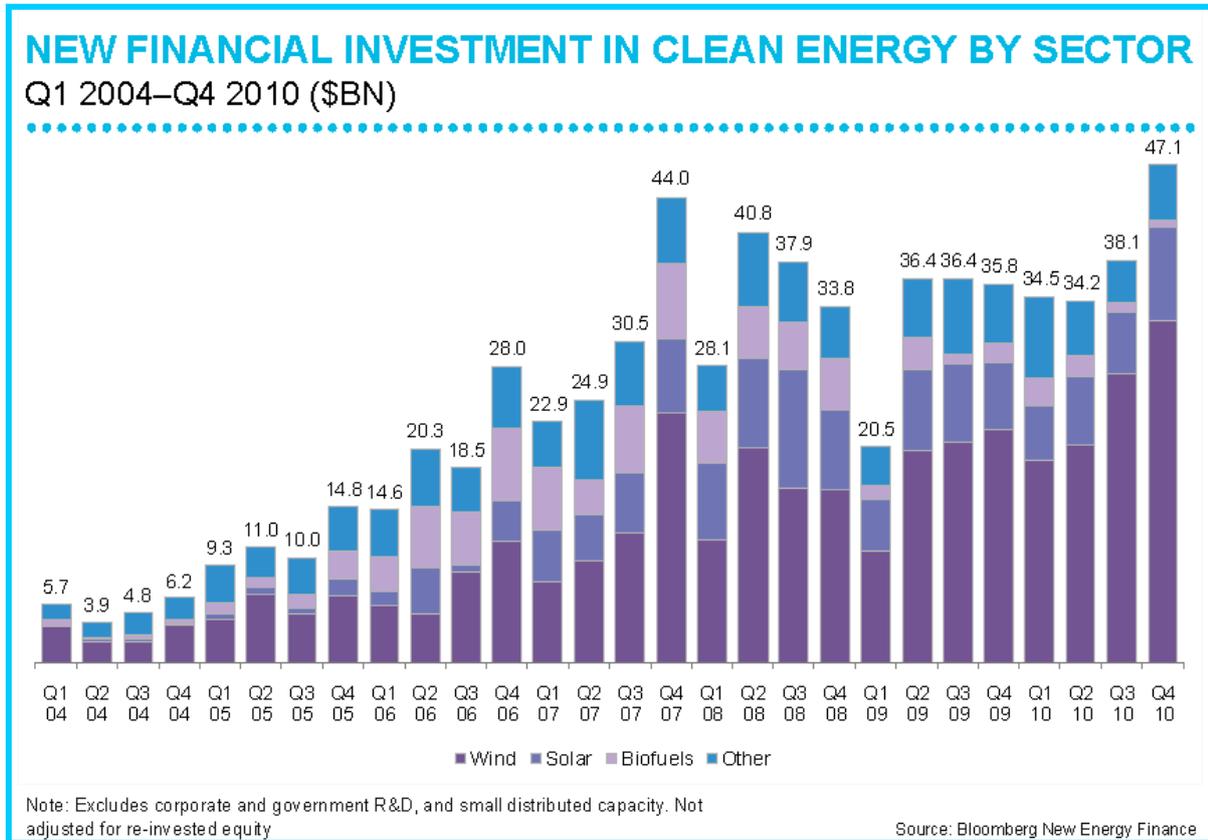
Clean Technology investments are often seen as highly speculative and backing only the leading edge of science innovation. If this was the case, then it would only suit those with a very high risk tolerance seeking large returns. Some of the larger US and European venture funds have taken this approach and put significant resources behind some very early stage biofuels and energy storage technologies that, if they succeed, will change the world.

The truth however is that with a little bit of research, it is easy to find a good number of companies that base their businesses on making money from doing environmental good without necessarily being at the forefront of technological innovation. That's not to say that every company claiming environmental benefits is a good investment – far from it – but there are plenty of options available for investors of all risk appetites.

Companies that fall into the clean technology ('cleantech') basket include those that are focussed on renewable energy (wind, solar, geothermal etc), water technologies, waste management and recycling, green buildings, energy efficiency, biomaterials, energy storage, vehicle technologies, environmental services, biofuels and carbon. The element that binds these diverse companies together is that their products and services all have both 'economic and environmental benefits'.

Global Activity

Research into the global investment into clean energy is undertaken and published by Bloomberg New Energy Finance. As can be seen in the chart below, the total global investments in clean energy peaked in 2008 and dropped back to 2007 levels during 2009. 2010 saw a strong recovery nearly back up to the 2008 levels. In particular, the fourth quarter of 2010 saw the highest recorded total financial investment into clean energy. For clean energy, Wind and Solar dominate the global investment picture. Other research into the venture capital investment across all of the cleantech sectors shows that, in 2010, the largest recipient sub-sectors were Solar, Energy Efficiency and Transport Technologies. North America still dominated the figures for cleantech venture capital in 2010 whilst Europe and the Asia region vied for top spot for total clean energy investment.



Much of this activity is being by regulatory measures. California is moving forward with its emissions trading scheme, Ireland is driving hard to deliver a large scale wave power industry, and even the UK – not famed for its sunshine - is rolling out large scale solar projects driven by its commercial scale feed-in tariff.

But cleantech is not just confined to the rich nations that led the first industrial revolution. Korea is driving economic growth through its Global Green Growth Initiative and is transforming its industrial conglomerates into cleantech leaders.

China too is driving the growth and development of many cleantech industries. The Twelfth Five Year Plan has seen the country place and even greater emphasis on environmental technologies. These are being driven to both clean up the country’s environmental problems, such as air and water quality and emissions reduction, and to create export industries.

Sadly, Australia with all of its abundant natural resources in renewable energy and its excellent research activity is falling well behind the pack. This is partly to do with a lack of

political will, partly driven by the riches being created through the resource sector and partly the lack of educated investors.

To understand the potential of cleantech for investors, for governments and for the community at large it is necessary to understand the drivers behind cleantech adoption, the short term sectoral trends and the longer term technology trends that will produce the long term solutions. Each of these areas is examined below.

Drivers of Growth

Much has been written on why investing in cleantech should derive superior long term investment returns¹. There have however also been discussions that the sector is just a 'green bubble'². The growth of this sector is however underpinned by four key and strong drivers that will ensure its longevity.

- There are many tangible assets being constructed to provide core services such as power, water, waste and recycling.
- The demand for these core services and for reduced impacts on the natural environment is growing due to both population growth and increasing wealth.
- As the world continues to use and deplete its natural resources there is increasing pressure on communities to adopt cleantech solutions to increase efficiency and decrease waste.
- There is the recognition of climate change and consequent regulatory regimes. This is a separate driver from those above and, whilst it will result in additional growth in some cleantech sub-sectors, it does not underpin the cleantech sector as a whole.

On a more immediate level, demand for cleantech products and services will grow from increasing demand from industrial companies. This demand is being driven by two issues:

- Larger companies around the world are facing increasing regulatory pressures to report on and reduce their environmental impacts. This not only includes emissions reporting but there are a multitude of other environmental regulations regarding air quality, effluent standards, impact on native vegetation and reduced water availability that are driving companies to seek more resource efficient and less polluting technical solutions.
- Companies are also starting to face supply chain pressures to both report on the environmental impacts of their operations and strive to reduce this footprint. Companies such as Walmart and Tesco are leading the way in this.

Cleantech Trends for 2011

In the short term, there are plenty of changes occurring being driven by political positioning, technology development, investment trends and increasing community awareness and changing behaviour.

Here are our top cleantech forecasts for 2011:

- **Carbon Déjà Vu** - The carbon debate in developed countries such as Australia and the United States that are seeking to introduce schemes will have a feeling of 'déjà vu' as arguments are repeated to oppose any broad based emissions trading scheme. This will be led by emissions intensive industries protecting their profits. Interestingly, countries that have historically been seen as the laggards of emissions trading, China included, are likely to take the lead in both the roll out of trading schemes and leadership positions in the global debate;
- **Policy on the Run** - There will be an increasing realisation within the community of developed countries that they are dropping far behind those countries seeing cleantech as a global industrial opportunity. The national politicians will then start to quickly make policy on the run to show that there is progress and that they are being competitive with the developments of China and Korea;
- **Chinese Wind to Dominate** - Chinese wind turbine suppliers will continue to enter new markets and their move to dominate global supply with high quality, cheap products. This growth will be accompanied by local assembly plants and partnerships in many countries which will make the 'threat' of the Chinese take over more attractive.
- **Large Solar Roll Out** – Whilst there has been steady growth over the last few years in specific countries, this will become more widespread during 2011 as solar approaches grid parity and the subsidies required to make projects viable decrease. There will also be a growing roll out of utility scale (30-50 MW), small utility projects (1-3 MW) and commercial scale projects (50-200 kW) projects in Australia, the UK, India and in other jurisdictions.
- **Electric Car Uptake** – with the launch of numerous electric vehicles in 2011, the uptake of EVs will happen quickly and to the detriment of internal combustion car makers. This uptake will then also drive recharging infrastructure, although most of this is likely to be home-based, and then smart grid applications.

- **Asian Money** – in the same way that investment has been coming from Asia into the global mining sector, 2011 will see the first of the large scale Asian investments into the international cleantech sector. This will open up the sector to more ambitious growth;
- **Local Money** – there is also likely to be a growing interest and roll-out of community financed projects, where communities take control of local development and, at the same time, secure the investment returns;
- **Insurance Takes the Lead** – globally, there is a strong move from the insurance industry to quantify the risks inherent in climate change and the associated regulatory measures. The insurance market is likely to start asserting its influence over investment decisions during 2011. Indeed, the insurance industry may end taking the lead in the climate debate and in driving industry and government to adopt and develop cleantech solutions.

Cleantech in China

In recent research undertaken by Australian CleanTech, we have completed preliminary reviews all of the listed Chinese companies to identify cleantech investment opportunities. Of the 154 companies we have identified to date, 122 companies are listed in Hong Kong, Shanghai or Shenzhen. Other exchanges that have listed Chinese cleantech companies include Singapore, Taiwan, New York, Toronto, Sydney and NASDAQ. These companies cover a wide variety of the cleantech sub-sectors with the largest group being in Solar with 34 companies, followed by Energy Efficiency with 31 companies and Water with 25 companies.

There are also many unlisted investment opportunities available. Many of these projects are available in China and increasingly, Chinese investors are looking to invest in cleantech projects and companies around the world.

Australian CleanTech is currently working with Chinese and Korean investor groups looking at investments into solar, wind and recycling opportunities in Australia, India, the UK and Malaysia. There appears to be a growing interest both from the Chinese investors to look globally and from project proponents happy to work with Chinese investment partners.

Long Term Cleantech Trends

To build both long term economic sustainability and investment returns, it is essential to have a view of the type and timing of technologies that will be adopted on a large scale. Much contemporary literature provides advice on current and forecast cost curves for future energy

technologies. There are other reports that provide forecasts of the future energy mix to 2020 or 2030. However, these provide little assistance to governments or investors wanting to fully understand long term trends.

Australian CleanTech has recently tried to consolidate many of the existing reports to provide longer term technology forecasts. The report, *Prosperous Sustainability: Clean Technology Forecasts to 2050*, presents a scenario of technology development. The forecasts include the timing of mass roll-outs of technologies and, possibly more interestingly, the timing of their decline. It is based on economic activity measures rather than installed capacity as this will indicate the areas of growth.

By understanding the likely timing of technology maturation, it is possible to develop policies that secure the maximum benefits for a specific region. These benefits may include opportunities for economic development, the creation of jobs and the potential to establish global or regional centres of excellence.

Cities, states or nations will have the greatest chance of securing technology leadership by recognising this potential early and implementing proactive policies to build the foundations of industry growth. These foundations may include policies focussed on investment attraction and the development of industry, infrastructure and skills.

The key assumptions and findings of the report are set out below.

Wind Energy - The current wind technology will grow quickly over the next few years and gradually be replaced by second generation technologies, which may include vertical axis and darrieus turbines, towards the end of the decade. Eventually the requirements for large towers and motors, will mean that wind is left behind as an expensive technology for new installations.

Solar Energy - Solar Roof Top Solar Panels will continue to grow quickly over the next few years. After that however, it is forecast that other solar technologies, such as building integrated photovoltaics (BIPV), will become cheaper and retrofit panels will start to become obsolete. Utility scale solar is forecast to have a long gestation but will form a major component of the industry by 2050.

Other Renewables - Geothermal is another long term survivor although it is going to take more than five years for the industry growth to occur with any significance. Wave and Tidal power follow the same growth path as geothermal through to about 2030, after which they start to decline as technologies with fewer mechanical parts emerge as cheaper options.

Transport Energy - Cellulosic and Algae Biofuels start to replace first generation biofuels within the next few years and, as oil prices increase, they will grow for some time. The growth of electric vehicles and recharging infrastructure has been brought forward by recent events

in the global car industry. The major global roll out will commence in 2011-12 and continue to grow throughout the forecast period.

The Built Environment - The built environment comprises energy efficiency, green building products and materials and smart grids. It forecast that this will continue to grow and innovate throughout the entire period. Energy efficiency and building products will grow quickly immediately as some of the easy wins are taken. Smart Grids, however, will only significantly expand in the 2020s once structural issues connected with distribution networks are resolved.

Water and Waste - Water and waste technologies are forecast to grow throughout the forecast period. Preserving, reusing and creating new sources of potable and 'fit-for-purpose' water along with materials recycling and resource recovery will be driven by growing populations and improved living standards.

There are of course many limitations to this type of foresight work. It will certainly not provide any policy or investment certainty. It may help to provide caution against backing industries with limited long term prospects. Its greatest use however is to provide a frame work for governments and investors to build long term economic benefits by focussing on the sectors of cleantech that are most likely to be 'winners' both globally and within their regions.

Benefits to Society

The potential benefits to society of the spread of cleantech are far more than just reduced environmental damage. Cleantech products and services will create more efficient businesses, less waste, greater recycling of all materials, higher standards of living, more fulfilling jobs and urban environments that are better places to live. Through adopting technologies that reduce energy, water and resource usage, societies will increase their productivity, their global competitiveness and drive local economic development and employment.

This applies not only to the starting of new companies with new technologies, but also to increasing the resilience of existing industry to more effectively compete in the future.

In the collection of essays, Opportunities Beyond Carbon³, the concept of the transition to a more sustainable world presenting opportunities to also find solutions to other societal problems is explored. For instance, by improving town planning and building design and utilising cleantech solutions, emissions and resource use can be reduced. This can also lead to more integrated communities and, ultimately, happier, more connected residents. Writing in the Environmental Leader, this thought is further developed by Mark Johnson⁴, who suggests that it requires a wider level of systems thinking rather than just the application of new technologies into existing systems.

The ultimate goal of cleantech is to integrate it into everything we do, and, in the words of Vinod Khosla (one of the world's leading cleantech venture investors), to become 'maintech'.⁵ The category will then not be something special: it will just be the way things are done. This is one of the reasons that investing in the sector has merit. Those technologies that do become 'maintech' will generate extremely healthy returns.

Cleantech investing is therefore not just about providing the scientific foundation for future technologies. Cleantech is just an essential part of the transition to a world in which efficiency is improved, productivity and economic growth improves and communities function more effectively.

John O'Brien is Managing Director of Australian CleanTech, a research and broking firm that provides advice to cleantech companies looking to grow, investors looking to invest in the sector and governments looking for economic development. Australian CleanTech works across Australia, China, Korea and Malaysia and publishes the Australian Cleantech Review and the Australian Cleantech Index.

¹ Aston A (18 December 2008) *Investing in Cleantech Companies*, *Bloomberg Businessweek*, http://www.businessweek.com/magazine/content/08_52/b4114070599591.htm

² Nordhaus T & Shellenberger M (20 May 2009) *The Green Bubble: Why Environmentalism Keeps Imploding*, *The New Republic*, <http://www.tnr.com/article/the-green-bubble>

³ O'Brien J (editor) (2009), *Opportunities Beyond Carbon: Looking Forward to a Sustainable World*, Melbourne University Press.

⁴ Johnson M (1 February 2010), *Why Systems Thinking, Rather Than New Technologies, Will Jump-Start the Clean-Tech Economy*, *Environmental Leader*, <http://www.environmentalleader.com/2010/02/01/why-systems-thinking-rather-than-new-technologies-will-jump-start-the-clean-tech-economy/>

⁵ Khosla V (2008), *It's about Main Tech, not Clean Tech*, <http://www.zdnet.com/videos/green/vinod-khosla-its-about-main-tech-not-clean-tech/222297>