

## Clean Technology Investments

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Clean Technology investments are often seen as highly speculative and backing only the 'bleeding' 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'.

### Drivers of Growth

Much has been written on why investing in cleantech should derive superior long term investment returns<sup>1</sup>. There have however also been discussions that the sector is just a 'green bubble'<sup>2</sup>. The growth of this sector is however underpinned by four key and strong macro-economic 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, revenues for cleantech companies will grow from increasing demand from industrial companies. This demand is being driven by two issues:

- Larger companies 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. In Australia, Reputex is now analysing and reporting on the supply chain emissions of the largest listed companies and this will increase this focus.

### **Investing in the Science of the Future**

In my work at Australian CleanTech, we work with technology companies, investors and governments in an attempt to drive the greatest benefits for all parties. We have worked with many technologies including the following:

- An environmentally friendly chemical vapour deposition technology that uses less energy and less toxic chemicals in the production of light emitting diodes

(LEDs) whilst at the same time reducing costs. This technology, being developed by BluGlass, has now found a new application in the production of very high efficiency (>50%) photovoltaic cells that will potentially change the economics of global concentrating solar installations.

- A nanotechnology enabled selective enzyme biosensor that produces real time, highly sensitive results for nutrient monitoring. The CleanFutures AquaSens technology offers greater management control for nitrates and phosphates in water and for sulfites in wine.
- Dye-based solar cells (DSC) using an electrolyte, a layer of titania and ruthenium dye sandwiched between glass to produce flexible photovoltaic films. Dyesol has developed the technology and is working with global roofing and window manufacturers to create economic building integrated solar solutions.
- A technology for recycling polypropylene (PP) back into pellets that can be used in the manufacture of new PP products of the same quality and at a reduced cost. Novarise is currently China's biggest PP recycler and is starting to roll this technology out globally.

Many other companies and technologies are innovating through utilising innovative business models including community finance and energy service company models. Often, the greatest success stories involve combining technology innovation with business model innovation to change the way consumers behave and how products are used.

### **Benefits to Society**

The potential benefits to society of the spread of cleantech are far more than just reduced environmental damage. 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 Carbon*<sup>3</sup>, 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 Johnson<sup>4</sup>, 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'.<sup>5</sup> 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.

Professor Dexter Dunphy of the University of Technology Sydney takes this one step further. By considering how corporations can go beyond just minimising their negative impacts on their environment and stakeholders, he envisages the *Sustaining Corporation*<sup>6</sup>. A Sustaining Corporation is one that has a positive impact on its surroundings by enhancing the quality of its community and natural environment. Cleantech solutions will be an integral part of achieving these outcomes.

Clean Technology 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.

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- <sup>1</sup> Aston A (18 December 2008) *Investing in Cleantech Companies*, *Bloomberg Businessweek*, [http://www.businessweek.com/magazine/content/08\\_52/b4114070599591.htm](http://www.businessweek.com/magazine/content/08_52/b4114070599591.htm)
- <sup>2</sup> 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>
- <sup>3</sup> O'Brien J (editor) (2009), *Opportunities Beyond Carbon: Looking Forward to a Sustainable World*, Melbourne University Press.
- <sup>4</sup> 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/>
- <sup>5</sup> 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>
- <sup>6</sup> Dunphy D, Griffiths A & Benn S (2003), *Organizational Change for Corporate Sustainability*, Routledge Press, Abingdon, Oxfordshire, UK