

## Submission to the Senate Economics References Committee on the Australian Innovation System

16 June 2014

### Submission made by:

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### Introduction

Australian CleanTech is research and advisory firm that works on environmentally focussed seed, venture and project investments in Australia, China, Korea and Singapore and with involvement in projects in Malaysia and the Philippines. We work with technology companies, investors and governments across all these regions to help facilitate the investment in and uptake of economically viable environmental goods.

In Australia, we manage two major industry development programs for the Department of Industry and have also worked for state governments, investors and many companies that provide environmental products and services. We also publish a detailed annual review of investment activity in the sector, the Australian Cleantech Review, maintain a stock market index of the listed cleantech companies and manage the Australian CleanTech Network, a national networking and pitching group.

Internationally, we have worked for investors looking at the Australian market, technology companies seeking market entry and governments facilitating the growth of their own cleantech companies. With a partner in Beijing, we publish the China CleanTech Index that tracks the 160 Chinese listed cleantech companies. We have been facilitating the development of a joint investment fund between Australia and Korea and are also working to facilitate a fund enabling Chinese investors access to the Australian market. Finally, we regularly speak at international cleantech investment and venture capital events and presented in Seoul, Vancouver and Singapore over recent months.

### Overview

Thank you for the opportunity to provide input into this critical inquiry. We have provided below some high level information with reference a number of your specific areas of focus. We have not however provided input to all areas as there will be others that have better insight into, for instance, the funding, policy position and employee retention issues for research institutions. We would be happy to provide further information or to answer queries at any stage if helpful.

At the highest level and as well recognised, Australia produces some excellent research outcomes but struggles to bring these concepts to fruition in a way that provides economic advantages for the country. Through Australian CleanTech's international work, we frequently find surprise that Australia does not support commercialising its excellent research to a greater extent. The return on investment in research is therefore good when considering global reputation but poor when considering economic payback.

The usual arguments for this failure are made around the lack of effective venture capital, the risk adverse nature of Australian culture, the weakness of university commercialisation

departments to name just a few. All of these have some merit but, as demonstrated by the repeated inability to find a quick fix, the issue is a complex challenge.

In our view, the key issues are as follows:

- **Risk Capital** - Australia is awash with risk capital but it is almost entirely devoted to finding the next patch of 'rich dirt'. The venture capital industry is small and has failed to grow significantly despite the success of the now discontinued Innovation Investment Fund Program. There has been good recent growth of angel and incubator groups and this is providing funding for low cost IT focused innovation but is still failing to fund many hardware related companies. To make a step change in this requires a new way of approaching the seeding and facilitation of venture funding in Australia.
- **Industry Collaboration** - there are few mechanisms to enable innovators to easily connect with each other and with those that will be the target customers in a non-threatening and collaborative manner. With effective clusters and shared learning at a point where innovators are not immediately seeking investment or sales, the innovators will learn what potential future partners are seeking and how to develop their products or services to ultimately better meet the needs of others.
- **Intellectual Property Ownership** - there is a big weakness in the Intellectual Property ownership structure in Australia whereby the majority of IP is owned by the publicly funded institution as opposed to the publicly funded researcher. Clearly the research institutions are keen to keep the status quo as they occasionally secure returns from commercialisation. However, the low level of successful research commercialisation and the often low levels of aptitude of university commercialisation departments indicates that this system is not providing a return on investment for the country.

This submission provides comments on a number of the specific areas of focus of your inquiry and suggests some solutions to each of the above key issues that may add value to your final conclusions.

### **(a) The Need to Attract New Investment**

We agree that there is a need to attract new investment into the Australian innovation ecosystem. However, we do not believe that this should merely be a matter of replicating or expanding previous schemes. Whilst the Innovation Investment Funds had some good successes it has failed to provide a sustainable funding model that has enabled ongoing reinvestment from successful entrepreneurs as has been seen in other parts of the world. We would therefore recommend that the Committee considers two alternative mechanisms to attract new investment.

1. **Equity Crowd Funding** - Whilst there are concerns regarding financial security, the growth of equity crowd funding for innovative companies globally provides a strong incentive for the financial regulations to be changed to enable this to happen locally. As things stand, an Australian innovative company is able to find loopholes in the current regulations and effectively raise equity through long-dated pre-sales or via US based systems that will accept Australian based investors investing in Australian connected companies. Given this is happening anyway, it feels sensible to provide a greater level of oversight and control and bring under the control of ASIC in a formal manner.

RECOMMENDATION 1 - Allow equity crowd funding to be fully accessible in Australia with appropriate regulation to safeguard investors.

2. **Joint International Venture Funds** - Australian CleanTech has been working for several years to help promote the concept of establishing international venture funds that

are partially funded by two national governments with complementary industries. This type of scheme is not unique and there are global precedents in operation.

A joint fund would be equally funded by both governments and aim to equally invest in each country. The investments would however be largely targeted at those that would have increased value through the links with and through the partner country.

If done well, a joint venture fund would:

- i. enable Australian start-up companies to more easily access global markets;
- ii. enable the building of value from Free Trade Agreements through facilitating market access; and
- iii. create a new way of financing innovation in Australia through linking investment with international market access and therefore potentially significantly increasing the value of the investment.

There is one particularly fund project that is well progressed and the international partner government is ready to provide their portion of the funding.

**RECOMMENDATION 2** - Commit to trialling Joint Venture Funds as a new and innovative form of financing Australian innovation.

### **(b) The Government's Approach to Innovation**

Innovation necessarily threatens incumbent business models. One of the clear roles of Government is to look beyond the vested interests of currently successful companies and make decisions that are in the best interests of the whole country over the longer term.

This task is complicated in Australia by both the short duration of election cycles which compound short term decision making and also the fractured and sometimes competing nature of innovation support from different levels of Government.

When looking to target innovation funding and effort, it is recommended that there is a transparent assessment of what national benefits will be derived should the investee company achieve its potential. This needs to be balanced with a need to allow funds to invest in the best companies but there should at least be a reporting requirement on some statistics of what 'success' might look like. This might include potential jobs, investment and trade that would be enabled through the initial investment.

Another area of focus for added benefit is how much the investee company will add value to other industry in Australia should it be successful. For instance, companies that have a focus on resource efficiency might be able to provide solutions to existing industry to help improve their efficiency, productivity and competitiveness. The national benefit of this would be both a growing young company with global potential and improved competitiveness for existing industry. The return on investment for the country would be significantly greater than for an equivalent successful company that provided no productivity benefits.

**RECOMMENDATION 3** - Future innovation funding to be weighted towards investing in companies and technologies that provide the greatest national benefits through creating local industry or assisting other parts of the economy to become more efficient and productive.

### **(c) Translating Research into Economic Benefits**

The conservative and bureaucratic nature of universities does not provide an organisational culture that lends itself to entrepreneurship and risk taking. This results in excessive levels of due diligence and unnecessarily restrictive contractual arrangements. From personal

experience of this self-defeating process, Australian CleanTech will not now work with any universities on commercialisation projects.

There is no justification for the research institution being the sole or major IP owner. If the funding comes from public sources then the funder should impose conditions that will create the longest term value for the country. IP could as easily be vested in the researchers if that would increase the chance of successful commercialisation. Individuals are more likely to take the risk of spinning out technology and taking the required risks to 'give it a go' than large bureaucratic institutions. There is probably an argument for some level of royalty payment back to the institution, but with control on the entrepreneurial decisions given to an individual, there is a greater chance that commercialisation pathways will be pursued with greater vigour.

RECOMMENDATION 4 - Through provision of public research funding, enable Intellectual Property to be primarily owned by the researcher(s) rather than the research institution.

#### **(d) The Relationship with Advanced Manufacturing**

Advanced manufacturing presents the only way in which developed and expensive nations are able to continue to provide manufactured products rather than relying entirely on service economy activities. Some countries including Australia also have the advantage of significant mineral and fossil resources but these also eventually become expensive compared to lower cost countries.

Advanced manufacturing enables the creation of high value and highly skilled jobs that can provide both increased efficiency for industrial customers and export trade to global markets. Therefore the national benefit of backing an advanced manufacturing technology is greater than would be generated in backing a purely service related business.

Advanced manufacturing ecosystems can build on the value of high quality research to deliver high value industry. This transition however requires a different set of skills to those normally considered part of an innovation ecosystem. Typical support skills and services included in innovation ecosystem maps include experienced legal, management, IP strategy and corporate structuring skills. When extending the focus to cover innovation through advanced manufacturing, the additional skills of design for manufacture, supply chain management, lean manufacturing - to name just a few - are required.

Any innovation ecosystem programs must therefore ensure that these additional skills are sourced and readily available to emerging companies.

RECOMMENDATION 5 - Facilitate advanced manufacturing innovation through the establishment of ecosystems that include all of the required engineering design and manufacturing services needed for success.

Two examples of ways that this type of ecosystem activity can be facilitated are through clusters and mentoring programs. Australian CleanTech has been delivering two programs for the Department of Industry since 2011 that have focussed on assisting the growth of high quality, high potential firms focussed on resource efficiency technologies. These programs have provided significant value for the participating firms through increased access to knowledge, capabilities, partners, customers and investors.

A summary of each of these programs is provided below.

**Cleantech Cluster** -. The cluster is formally titled the Cleantech Capability Teams and has over 250 member companies. The cluster works extensively with industries in mining, manufacturing, property and food to identify resource efficiency related challenges and then sources solutions from within the cluster members.

The membership comprises a wide variety of companies with fully commercialised products looking to increase their market access and customer base. The benefits of successful outcomes delivered through this program are that not only through increased sales to the member companies but also the industry customers benefit through adopting more resource efficient operations.

Cluster membership also includes internal service providers that assist other members with professional services to improve their sales outcomes and profitability.

A flyer for the program is provided in the Attachments and further information is available at [www.cleantech-teams.com.au](http://www.cleantech-teams.com.au).

**Australian Technologies Competition** - Australian CleanTech developed and manages the Australian Technologies Competition mentoring and awards program. Now in its fourth year, the program aims to find and assist Australia's best companies providing resource efficiency technology solutions. The program identifies 30+ Semi Finalists each year and then provides to each of these companies:

- intensive mentoring to address weaknesses in their business plans;
- connections to partners, customers and investors in Australian and internationally; and
- publicity and exposure to help raise their profiles.

The judges assess the entrants on the basis of the quality of their technology, the market potential of this technology and their business strategy. Many good technologies do not get shortlisted due to failures to appreciate their realistic market and its access channels. The companies that do get shortlisted are therefore those that have the greatest global potential for commercial success and the associated national benefits that their product provides.

The 2014 Semi Finalists and the list of 2011-13 Alumni companies are provided in the Attachments and further information is available at [www.austechcomp.com](http://www.austechcomp.com)

Similar programs could be initiated or extended to encompass other streams of advanced manufacturing firms.

**RECOMMENDATION 6** - Facilitate advanced manufacturing growth through clusters and mentoring programs to help increase capabilities, connections and exposure for emerging companies.

### **(i) Policy Actions to Enable International Engagement**

International engagement for innovation can be delivered through the creation of international joint venture funds with specific mandates to invest in companies that have potential to increase bilateral trade and then also facilitate the delivery of that trade.

This can be particularly effective where the partner country has better access to larger markets, such as the US, Europe or Asia. The partner country can then be utilised as a route for Australian companies to secure a global footprint.

This policy action is covered by Recommendation 2.

### **(i) Policy Options to Create an Innovation Pipeline**

To provide support for emerging industries in areas of future competitive advantage requires a structured approach to assessment and delivery. It also necessarily requires long term programs that provide an environment for ongoing investment and development that will deliver significant benefits over the longer term

The planned outcomes of this program should be to create national clusters of excellence that are delivering world-leading solutions to Australian and international customers and building Australian industry capabilities and expertise.

To achieve this requires the mapping of both current capabilities and technology development pathways. This would enable forecasts of areas of activity in which Australia may be able to secure a leading global position. It is essential to both look at existing capabilities and at forecast technology adoption trends to be able to focus on areas of activity where Australia already has strength and for which the future demand will be high.

The approach will be deliberate and targeted and will focus on a small group of clusters (maybe a maximum of three) that have the greatest potential to make a long term and significant contribution to the economic development of Australia.

To be able to effectively deliver this project requires a mix of deep industry knowledge, an understanding of technology capabilities and future technology trends and a study of global case studies of how clusters of excellence have been most effectively and efficiently delivered.

Activities that would need to be included in this program are described below.

- 1. Capability Mapping** - by looking at pockets of excellence it is possible to build a profile of the Australian capabilities in specific technology areas. This process can also highlight potential gaps in these pockets of excellence into which it may be possible to direct future research efforts to further build on the existing capabilities.
- 2. Supply Chain Focus** for collaborative outcomes. This could build on the initial capability mapping to then examine to full supply chains for the component companies identified as parts of the centre of excellence. This would provide a more complete capability map and highlight areas of strength and weakness in building a growing industry base.
- 3. Technology Trends Focus** - to understand the potential for growth of the centres of excellence, it will be essential to take a view of future technology trends and, more importantly, technology adoption trends. This will enable the greatest effort to be applied to the activities that have the greatest potential to grow into significant industries. It will also enable a balancing of the benefits of developing world leading technologies against those that have the greatest commercial potential.
- 4. Transforming Existing Industry** - the final stage of the work might to review how the growth of the identified target sectors might be utilised to assist existing industries to transform and reinvent themselves. This would look at the skills base required for industry growth for the targeted centres of excellence and compare that to skills that already exist within Australian industry. Where matches are found, guidance could be provided on industry transition plans to enable the greatest economic benefits to be retained by Australian companies. Not only would this provide a growth path for existing industry but it would also build in resilience by opening up new revenue streams for existing companies that may have a heavy reliance on declining industries.

Australian CleanTech has developed this concept into something that is deliverable and will create tangible benefits for all parties and would welcome the opportunity to provide further insight into how this can be delivered effectively without being too slowed by the necessary bureaucratic oversight.

**RECOMMENDATION 7** - Facilitate the creation of national clusters of excellence that are delivering world-leading solutions to Australian and international customers and building Australian industry capabilities and expertise.

## **RECOMMENDATIONS**

The recommendations that have been made above are repeated below.

<b>Ref</b>	<b>Recommendation</b>
1	Allow equity crowd funding to be fully accessible in Australia with appropriate regulation to safeguard investors.
2	Commit to trialling Joint International Venture Funds as a new and innovative form of financing Australian innovation.
3	Future innovation funding is to be weighted towards investing in companies and technologies that provide the greatest national benefits through creating local industry or assisting other parts of the economy to become more efficient and productive.
4	Through provision of public research funding, enable Intellectual Property to be primarily owned by the researcher(s) rather than the research institution.
5	Facilitate advanced manufacturing innovation through the establishment of ecosystems that include all of the required engineering design and manufacturing services needed for success.
6	Facilitate advanced manufacturing growth through clusters and mentoring programs to help increase capabilities, connections and exposure for emerging companies.
7	Facilitate the creation of national clusters of excellence that are delivering world-leading solutions to Australian and international customers and building Australian industry capabilities and expertise.

## **ATTACHMENTS**

Cleantech Capability Team - Industry Brochure

Australian Technologies Competition - 2014 Semi Finalists and 2011-13 Alumni Companies

**Attachment**  
**Cleantech Cluster Flyer**





# Cleantech Capability Teams

## Connecting Industry with Energy, Water, Waste and Environment Solution Providers

We aim to provide a simple, easy and cost effective way in which the **Mining, Manufacturing** and **Built Environment Sectors** can interact with companies and organisations that provide cleantech solutions.

Cleantech companies provide a wide variety of solutions including products and services involved in renewable energy, water, waste, recycling, energy efficiency, energy storage, building products, transport technologies and environmental services.

**A One-Stop-Shop for Energy, Water, Waste & Environment Solutions.  
FREE SERVICE TO INDUSTRY**

### BENEFITS FOR INDUSTRY

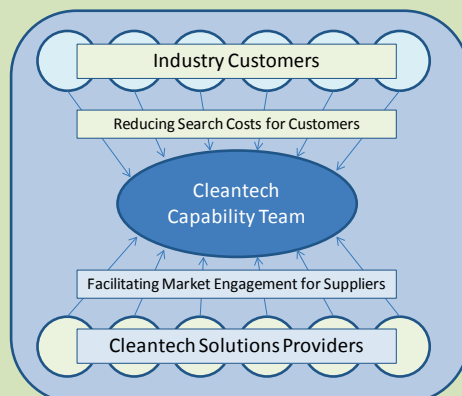
The uptake of cleantech solutions helps customers to become more efficient, competitive, resilient and sustainable.

This free service helps industry to find the best solutions for them in the quickest time.

This saves time, ensures good quality introductions and enables you to pick the right solution for your operations.

### CLEANTECH CAPABILITY TEAMS

We are a national network of over 250 companies that is industry-driven and industry-chaired. The Team administration is funded through a grant from the Australian Department of Industry, but the team is self-sufficient and commercially focussed.



### WORKING WITH INDUSTRY

When working with a company, we have found that the following three step process creates that greatest benefits:

#### 1. DEFINE PROBLEMS

Meet with the Industry Client and discuss the biggest problems they face with respect to energy, water, waste or other environment related issues.

#### 2. SEARCH FOR SOLUTIONS

Assess solution options and call for expressions of interest from solution providers. Assess responses and discuss options with Industry Client.

#### 3. FACILITATE ENGAGEMENT

Facilitate a workshop with Industry Client staff and solution providers on generic solutions available now and those that will be available in the near future. Work with Client staff to build knowledge and facilitate successful discussions.

#### Contact Details:

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#### Find out More at

[www.cleantech-teams.com.au](http://www.cleantech-teams.com.au)  
Including the Full Team Directory

Supported by :



**Attachment**  
**Australian Technologies Competition**

**2014 Semi Finalists**  
**&**  
**2011-13 Alumni Companies**

## Australian Technologies Competition 2014 - Semi Finalist Overviews

Name	Company	State	BUILT ENVIRONMENT	ENERGY	FOOD	MANUFACTURING	MINING	WATER	Entry Summary
Jason Beath	Acid Solutions	QLD					Y	Y	Acid Solutions provides a solution to very quickly treat extremely large volumes of highly contaminated, low pH, dissolved metal contaminated water to irrigation, drinking water or environmental release quality. Its capabilities allow the treatment hundreds of millions of litres of contaminated water in-situ on difficult to access remote sites such as mine sites.
Ole Jochen Stockhausen	Aeratron	NSW	Y	Y					Aeratron provides an energy saving, noise reducing fan/turbine technology suitable for applications in IT, server cooling, medical devices, defence, and many more. With more than 10,000 units sold worldwide, Aeratron is currently finalising its extended product range (light, different sizes, accessories), with all products being the most energy efficient and quietest in their class.
Gary Finke	Aromatrix Australia	QLD	Y			Y			Aromatrix Australia's technology involves the treatment of air for removal of hazardous or odorous gases in industrial settings. The heart of the treatment process uses bacterial (both autotrophic and heterotrophic) inoculated on a packing media to absorb pollutants through the bio-film which are then degraded to simple non-hazardous and non-odorous compounds. The process is environmentally sustainable and the operating costs a fraction of more traditional forms of gas treatment.
Yuri Obst	Baleen Filters	SA			Y		Y	Y	The Baleen filter is an engineered adaptation of the natural technique used by the class of filter-feeding whales of the same name. Baleen employs a 'double-act' of high pressure, low volume sprays (one which dislodges material caught by its filter media, whilst the other sweeps it away for collection) without need for downtime, making it a truly continuous self-cleaning filter/separator with collected material often recognised as a resource rather than as waste.
Elizabeth Lette	BioGill	NSW			Y	Y		Y	BioGills are clean, green, proven bioreactors providing superior biological wastewater treatment at lower cost and lower energy. BioGills use patented, flexible Nano Ceramic Membranes known as "gills" that are radically different from conventional bioreactors. BioGills provide the ideal, oxygen-rich habitat for microorganisms to rapidly grow and effectively "eat" the nutrients out of wastewater. With installations now in 7 countries, BioGills are helping resorts, tourist parks and food/beverage processors achieve regulated discharge standards.
Phil Hodgson	Calix	NSW				Y		Y	Calix has invented, developed and patented the step-change in kiln ("calcination") technology needed to meet the demand for CO2 emissions reductions, particularly for calcining carbonate minerals such as limestone and magnesite to oxides. Using indirect-counterflow heating, Calix reactors efficiently process minerals by radiative heat transfer through a central reactor tube, producing oxides and enabling the capture of pure CO2. The process gives control of the product reactivity, with reactivities up to ten times higher than convention product.
Michael Ottaviano	Carnegie Wave Energy	WA		Y					Named after a Greek sea goddess, the CETO Wave Energy Technology harnesses the enormous un-tapped renewable energy present in our ocean's waves and converts it into two of the most valuable commodities underpinning the sustainable growth of the planet; zero-emission electricity and zero-emission desalinated water. Carnegie's design philosophy is to produce the most robust and lowest cost wave power technology.

Name	Company	State	BUILT ENVIRONMENT	ENERGY	FOOD	MANUFACTURING	MINING	WATER	Entry Summary
Tony Formica	CINTEP	QLD	Y	Y				Y	CINTEP's Recycling Shower system reduces water and energy consumption from showering by 70% without reducing flow rate, temperature, or time in the shower. For every 3.3 litres at the showerhead, we only use 1.0 litre of water. Other features include: built-in chlorine filter, touch screen display with shower usage information, remote control option, and very precise digital temperature control.
Robert Stevenson	Ecoult	NSW		Y					UltraBattery energy storage solutions are safe and has complete existing end-of-life recycling. Combined with Ecoult's enabling software and hardware, UltraBattery outperforms its competitors in longevity, cycle life, efficiency and performance. UltraBattery is a hybrid lead-acid energy storage device containing both an ultracapacitor and a battery in a common electrolyte. It provides a 13x increase in longevity over traditional lead acid batteries when operated in high rate charge and discharge applications.
Greg Solomon	Eden Energy (Carbon)	WA	Y			Y			Eden Energy converts methane into hydrogen and carbon nanotubes without producing CO2 by using its proprietary catalytic pyrolysis process. The produced Carbon Nanotubes can be used as an additive to concrete or polymers to significantly increase compressive and flexural strength, and electrical and thermal conductivity.
Euan Beamont	Energy Farmers Australia	WA		Y	Y				Energy Farmers has created an on farm, waste to energy solution for poultry manure. The system enables farmers to alleviate the problems of on farm storage of poultry waste, use heat generated through the process for their farming operation and produce high value, nutrient rich by-products to sell. The by-product of the process is biochar, an increasingly in demand product for soil conditioning. The advantage of our technology is that it is continuous flow, can handle a wide range of waste types, is simple to operate and maintain and can process the litter without the addition of other feedstocks.
Andrew Proud	Global Future Solutions	QLD				Y			Global Future Solutions (GFS) has developed and patented a method of producing surfactin. Surfactin is one of the most powerful biosurfactants available. Our unique approach uses Bacillus subtilis and the surfactin it produces to manufacture a poultry house sanitizer that far exceeds the effectiveness of currently used toxic sanitizers. Unlike current products, GFS Poultry Protect can be used to treat both the shed and the litter. It is cost effective for the grower as it produces healthier birds and is effective over an extended period of time controlling pathogens & pests, while also controlling odour.
Trevor Bayley	Green Distillation Technologies Corporation (GDTC)	VIC		Y					GDTC recovers energy from end of life tyres. The technology, known as Destructive Distillation, which is based in pyrolysis, breaks down the rubber in a tyre into its constituent atoms. Some of these recombine into a hydrocarbon vapour which is extracted and condensed into a 'manufactured' oil comparable to a light crude or a #2 diesel fuel. Of 100% energy utilised in the manufacture of a new tyre, GDTC recovers approximately 65% in the form of oil and carbon.
David Anstee	GreenSync	VIC		Y					GreenSync is a technology company in the energy analytics area. The company's technology uses cloud computing to simulate energy system constraints enabling it to locate, profile and forecast upcoming problems. GreenSync is working with major utilities to reach their customers, and enrol them into demand management programs.
Kyle Wolff	Hydrasyst	QLD	Y			Y		Y	Kerawash™ is a patented and disruptive water recycling technology for continuous batch washers (CBW) in the commercial laundry industry. Commercial laundry is one of the largest consumer of potable water and generator of polluted waste water. Using Kerawash, a typical commercial laundry operation will reduce water use by up to 80% reduce energy use by up to 70% and reduce water pollution loading in trade waste.

Name	Company	State	BUILT ENVIRONMENT	ENERGY	FOOD	MANUFACTURING	MINING	WATER	Entry Summary
Gary Bertuch	HySSIL	VIC	Y						HySSIL is commercialising a range of green, lightweight, sustainable building products based on the CSIRO's biomimicry and geopolymer technologies, which will make construction of housing and commercial buildings significantly more affordable and sustainable. The HySSIL products currently being commercialised are geopolymer lightweight cellular precast wall panels and flooring systems and geopolymer lightweight roof tiles.
Gennadiy Sukhinin	InnovEco Australia	VIC					Y		InnovEco developed a new process based on the ion exchange (IX) technology which solves some problems in the existing copper extraction processes. One particular problem is the presence of large quantities of fines fractions in the ore which significantly reduces the efficiency of the traditional technologies. Proposed IX process can recover over 90% of copper and other metals from fines, clays and low grade minerals in a cost effective way in comparison to less than 50% using traditional methods.
Jolleh Abshar	Magellan Power	WA		Y					The GPSS-SWR is an energy storage solution consisting of solar panels, a four quadrant inverter, lithium batteries and a battery monitoring system. It is designed to correct power quality problems associated with the Single Wire Earth Return transmission system used in regional areas.
Emma Davis	Marinova	TAS			Y	Y			Marinova is a biotechnology company focused on developing innovative medical and nutritional applications from marine plants. Specifically, Marinova's manufacturing facility is targeted to the extraction of sulphated polysaccharides known as fucoidan from brown seaweeds. Marinova's solvent free Maritech® extraction technology generates a high volume of aqueous by-product containing significant quantities of nutrients and minerals beneficial in horticultural applications. This by-product is being commercialised to achieve increased crop yields and qualities.
Geoffrey Bell	Microbiogen	NSW		Y	Y				Microbiogen leads the world in the development of new and novel strains of the yeast <i>Saccharomyces cerevisiae</i> (SC). The yeast SC underpins over US\$300 billion in products per year and is the most widely utilised industrial micro-organism in the world by a factor of 100 times. Microbiogen's technology is unique in that it utilises advanced breeding technologies to develop new and industrial characteristics that are unable to be developed through genetic engineering approaches. Specific areas of successful development by Microbiogen include adding the ability to metabolise xylose, the ability to grow at industrial rates on non-sugar low value waste streams such as glycerol and organic acids, higher tolerance to temperatures, faster and more efficient fermentations when producing alcohol amongst others.
Callum McCracken	Minnovare	WA	Y				Y		Minnovare has found the solution to time consuming land surveying methods when aligning a drill rig by developing the Azimuth Aligner. The device is easy for drillers to use and significantly improves the operational performance and productivity of setting up a drill rig to a heading and inclination by reducing the time needed to physically align a drill rig from more than 1.5 hours to just five minutes.
Stephanie Moroz	Nano-Nouvelle	QLD		Y					Nano-Nouvelle's Tin Nanode increases the energy density of lithium ion batteries by up to 50% compared to the current graphite technology. This will allow thinner batteries to last longer in applications such as mobile phones and tablets in particular, and will provide benefits in most other applications.
Michael Vainer	Polymeric Powders Company	VIC				Y			The company has developed environmentally sustainable technologies for utilising reclaimed natural/synthetic rubber crumb (including tyre crumb) as raw materials for the manufacture of a new engineering material – Polymeric Powders. The powders are a genuine partial substitute for the more costly natural/synthetic rubber base polymers required by industrial and automotive rubber products manufacturers, as well as a valuable ingredient for plastic-rubber composite materials manufacturing in their own right including 3D printing.

Name	Company	State	BUILT ENVIRONMENT	ENERGY	FOOD	MANUFACTURING	MINING	WATER	Entry Summary
Phillip Henshall	QuikCool Cooling Technologies	SA		Y	Y				Quickcool's product is a thermal storage system that can store cold energy in special ice bank tanks using cheaper off peak electricity at night to then provide cold energy during the day to commercial refrigeration medium temperature applications. It is in simple terms "special ice" and is capable of achieving reductions in energy costs of up to 50% compared to alternative systems.
Bob Cart	RayGen Resources	VIC	Y	Y		Y	Y		RayGen Resources is developing Concentrated Solar Photovoltaic (CSPV) technology that may soon produce the cheapest energy in the world. RayGen uses sun-tracking mirrors called heliostats to concentrate sunlight onto high-efficiency, multi-junction solar cells that were originally designed for use in space. RayGen's system weighs half that of typical PV systems, is upgradeable and scaleable, redeployable and self-calibrating, cheaper than other CSP solutions and more powerful than other PV solutions.
Prof Chem Nayar	Regen Power	WA		Y			Y		Regen Power has designed and developed a fully integrated innovative HybridGEN™ Power Pack generator with variable speed diesel generator, solar/wind and battery pack with load management and control system. HybridGen saves 85% fuel over a conventional generator and avoids 25 tons of CO2 per 10KW generator / year. Hybridgen is better because it overcomes problems that conventional diesel gens experiences such as: the engine operating on low load efficiency affecting wet stacking and cylinder glazing; poor fuel efficiency; poor reliability; maintaining stable voltage and frequency under varying solar and wind inputs.
Tim Kealy	Rheology Solutions	VIC		Y	Y	Y	Y		Rheology Solutions has brought to market novel technologies for an online process control instrument that delivers real-time data to afford better quality control for production processes, initially in the food, personal care and, later, mining and other sectors. The instrument is an 'OnLine Rheometer' (OLR), which measures and delivers a characteristic flow curve for a liquid in a pipe in real time.
Malcolm Robertson	Robertson Technology	WA		Y				Y	The Robertson Technology provides a measurement of efficiency and fluid flow rates of motor driven devices such as pumps, blowers, and hydro-turbines, by thermodynamic methods. It is accurate and stable differential temperature measurement (< 0.001°C over 10 years), can be portable or fixed and has low maintenance costs.
Robin Bean	Safelash	NSW				Y			The Safelash patented lashing harnesses for containers on ships significantly cuts processing times (0.5-2 hours), are ergonomically superior and greatly reduce the load (-90%) on workers. Its electronic actuator further reduces effort and provides process assurance. This will improve operational security and cut insurance costs. Labour reductions and fuel savings will deliver significant direct savings per lift.
Mark Halliwell	Taggle Systems	NSW	Y					Y	Taggle Systems has developed a radio-based telemetry system which is being deployed as Australia's first dedicated M2M telecommunications network. Its aim is provide a means by which to gather small amounts of data from millions of devices at low cost hitherto unavailable. The system comprises low-cost, low-power transmitters which send small data packets hourly from, say, water meters for over 10 years on a single AA battery to a receiver.
Robert Romer	TankPro	NSW	Y		Y	Y		Y	The TankPro Unit is a small, portable, stand alone water sterilising unit that provides eco-friendly re-use of stored or collected water. The primary use for the TankPro unit is for sterilizing diseased water containing human harmful bacteria, micro-organisms, pathogens and viruses that is responsible for the deaths of millions of people every year in developing countries that do not have access to clean, safe sterile water.

Name	Company	State	BUILT ENVIRONMENT	ENERGY	FOOD	MANUFACTURING	MINING	WATER	Entry Summary
Dr. Caroline Noller	The Footprint Company (TFC)	NSW	Y						TFC has developed a cloud based Life Cycle Assessment platform "Plan8 iQ" which resolves the critical need to connect building designers with whole-of-life environmental information at the point of design. It successfully eliminates two fundamental barriers to more sustainable buildings being, the cost and time intensity of assessments. Plan8 iQ achieves a factor 10 reduction in these barriers, which TFC hopes will deliver radical innovation.
Jeffrey Moore	Virtual Curtain	WA					Y	Y	The Virtual Curtain technology purifies mine wastewater in a rapid, more-effective way that does not require substantial infrastructure or difficult chemistry to achieve. The treatment involves the formation of hydrotalcite, a layered mineral that simultaneously incorporates many of the contaminants already present in the wastewater in a synergistic way into it's structure. The development of the Virtual Curtain technology challenges the longstanding paradigm of the use lime to treat acidic mining wastewaters.
Dr Penelope Mitchell	WDU Sustainability	QLD				Y			WDU Sustainability's OSCA (On-Site Composting Apparatus) is an automated, aerobic composting technology designed for on-site management of organic waste. Using minimal energy, OSCA processes food waste, agricultural waste, compostable packaging, paper and cardboard, manure, and green waste into safe, stable, high quality compost.
Richard Turner	ZEN Technologies	SA		Y					The ZEN Freedom PowerBank is a residentially sized Energy Storage System with unique aggregated fleet control designed as alternative infrastructure for Utilities to maximise the value of existing grid infrastructure through "edge of grid" energy storage. The system features large format lithium ion phosphate cells for compact long life use. And a full Battery Operating System (BOS) for intelligent distributed control on the grid. The system comes standard with 20kWh of Energy Storage with options for 10kWh or 40kWh.
Daniel Zafir	Zenogen	NSW		Y		Y			Hydrogen is the fastest growing industrial gas market worldwide, worth US\$150B annually, for use in the manufacture of metals, chemicals, semiconductors and food products. The traditional methods of producing hydrogen involve fossil fuels or electrolysis using platinum catalysts. Zenogen's technology is a proprietary electro-catalyst that eliminates platinum metals, reducing the cost of catalysts potentially to 1/10th of today's prices, with a demonstrated improvement in energy efficiency of over 30%.

# Competition Alumni Companies

## 2013 Finalists & Semi Finalists

Company	Company Overview	Website
<b>AUSTRALIAN WINNER 2013 &amp; MANUFACTURING CLEANTECH AWARD WINNER</b>		
BluGlass Limited	BluGlass is a semiconductor company bringing to market a breakthrough in the LED lighting and solar industries called Remote Plasma Chemical Vapour Deposition (RPCVD). RPCVD is a revolutionary approach to the manufacture of group III nitrides which are essential components of millions of electronic and power devices.	<a href="http://www.bluglass.com.au">www.bluglass.com.au</a>
<b>MINING CLEANTECH AWARD WINNER</b>		
Global Future Solutions	Global Future Solutions (GFS) is an Australian Biotechnology company producing environmentally friendly products for the Oil and Gas, Poultry, Life Sciences and Sanitisation Industries. This submission is focussed the Oil and Gas industry, specifically the highly controversial unconventional gas extraction. GFS MEGR 102 is unique in that it utilises bacteria and bio surfactin to replace toxic chemicals and outperforms the competitor's products in all gas well environments.	<a href="http://www.globalfuturesolutions.com">www.globalfuturesolutions.com</a>
<b>BUILT ENVIRONMENT CLEANTECH AWARD WINNER</b>		
Organic Response	Organic Response is a revolutionary lighting control system using Distributed Intelligence to deliver maximum energy savings with optimal occupancy comfort. Uniquely, the technology requires no additional design, hardware, wiring or commissioning to install. The system allows other building management systems to access and exploit its real time, location specific occupancy information to make more intelligent decisions and improve their own energy efficiency.	<a href="http://www.organicresponse.com.au">www.organicresponse.com.au</a>
<b>ARENA RENEWABLE ENERGY AWARD WINNER</b>		
Specialty Coatings	EnerSheet™ is a large format resin-impregnated fibreglass composite roof sheeting product with embedded thin film solar photovoltaic (PV) material. EnerSheet™ is easy to install and is Australia's only building-integrated PV (BiPV) roofing material.	<a href="http://www.specialty.com.au">www.specialty.com.au</a>
<b>FOOD &amp; BEVERAGE CLEANTECH AWARD WINNER</b>		
Z-Filter	Z-Filter separates solids from liquids, by trapping them inside a single, zippered, filter element a 'Sock'. The Z-Filter continuously filters separates, rolls, compacts and compresses the solids inside the sock expelling the liquids to provide a dry cake. Z-Filter's 'Filtration Innovation' is the most efficient means available to separate solids from liquids.	<a href="http://www.z-filter.com">www.z-filter.com</a>



Company	Company Overview	Website
<b>2013 FINALISTS</b>		
Elevare Energy	An Australian power electronics company using its technology to make energy storage with batteries commercially viable reducing GHG's and rising power prices. Solutions include community energy storage and the dSTATCOM that solves Power Factor Correction and other issues in commercial sites.	<a href="http://www.elevare-energy.com">www.elevare-energy.com</a>
MicroHeat Technologies	MicroHeat Technologies (MHT) develops advanced fluid heating technologies, that is patent (PCT) protected globally and delivers energy optimisation & water consumption reduction. The Technology uses a 'direct energy transfer' method of heating to for point of use appliances with a small footprint .	<a href="http://www.microheat.com.au">www.microheat.com.au</a>
RayGen Resources	RayGen is creating the lowest cost power generation technology in the world - and it's renewable. RayGen's solar technology combines the most efficient solar cells (>44%) with mirrors, the lowest cost and most efficient collector. Unlike all other PV systems, RayGen separates collector and generator to optimize each independently. This provides a breakthrough in cost reduction.	<a href="http://www.raygen.com">www.raygen.com</a>
<b>2013 SEMI-FINALISTS</b>		
Bombora Wave Power	Bombora Wave Power has developed a novel wave energy convertor that converts the ocean's swell into a fossil fuel free source of cost effective electricity. Through a sturdy, seabed mounted design and flexible membrane, we're able to withstand storms and harness a greater proportion of the available wave energy.	<a href="http://www.bomborawavepower.com.au">www.bomborawavepower.com.au</a>
Commercial Diving Services	HST assists ships to travel faster through the water, consume less fuel and emit lower green-house gases, ensuring that their hulls are clean and smooth - free from fouling organisms such as slime, algae, weed and/or molluscs - through the application of heated sea water within a patented underwater device which travels along ships' hulls.	<a href="http://www.commercialdiving.com.au">www.commercialdiving.com.au</a>
DiUS Computing	DiUS Computing's ChargeIQ is a world-leading home charging solution for plug-in electric vehicles. ChargeIQ seamlessly integrates the driver, vehicle and the grid to minimise the costs of charging for vehicle owners, utilities and society more generally.	<a href="http://www.dius.com.au">www.dius.com.au</a>
F Cubed Australia	F Cubed's unique technology is a solution to the world's water issues only using natural renewable solar energy. F Cubed panels produces pure clean drinking water, from any feed water source by bio-mimicking the natural water cycle of evaporation and condensation; also producing a secondary water supply of UV disinfected, heated, and filtered water, precipitating inorganic compounds and leaving no waste..	<a href="http://www.fcubed.com.au">www.fcubed.com.au</a>
Imaca NeoPower	Neopower solar hot water uses highly efficient evacuated tube solar collector to collect the sun energy. When the solar controller senses the collector is heated by the sun, it will give a signal to a circulation pump, then the pump pushes water through the solar collector, transferring the captured heat into the water.	<a href="http://www.neopower.com.au">www.neopower.com.au</a>

Company	Company Overview	Website
KATRU Eco-Inventions	The IMPLUX™ Wind Power Turbine (IMPLUX) is an internationally patented, distinctly unique cutting edge technology that delivers power from turbulent winds in the urban environment. It is a highly efficient technology which captures the limited urban wind resource. IMPLUX overcomes the shortcomings of existing turbines for urban applications including poor efficiency, safety, noise and aesthetics via a radically different next generation design developed specifically for multi-storey buildings.	<a href="http://www.katru.com.au">www.katru.com.au</a>
New Wave Power Systems	The DC HYBRID Power Transmission System is designed to achieve optimum efficiency when integrating energy generation, storage and consumption within a building. The system allows a premise to use renewable- generated (DC) energy either directly - for example to power lighting - or by storing the energy for possible back-up power, UPS or peak time load-shifting.	<a href="http://www.map.eng.unimelb.edu.au/teams/power-system/">www.map.eng.unimelb.edu.au/teams/power-system/</a>
Nexus eWater	Nexus eWater is commercialising products that will transform the energy and water performance of homes by unlocking the value of grey water, an abundant and largely untapped resource found in every home. These innovative products will deliver high-efficiency hot water using heat recycled from grey water, and high-quality treated water for non-potable uses such as toilet flushing and garden irrigation.	<a href="http://www.nexusewater.com">www.nexusewater.com</a>
ORACLE Air Conditioning Services	Air-conditioning units are least efficient at high ambient temperatures, when cooling demand is highest. We have developed a new hybrid chilled-water evaporative cooling technology. We have named our technology as an 'ultra cooler' because of its performance capabilities relative to other evaporative cooling products.	-
Oztren Industries	Rotogen is a variable pitch vertical turbine system that is self regulated and dynamically adjusts to the wind in gusty conditions, making it safer and able to work in a wider range of weather conditions. It is reliable in extreme weather and outperforms all other vertical turbines for total variability both in blade adjustment and grid tie power production.	-
Positive Recycling	Positive Recycling delivers a Used Battery Collection Service that provides a convenient, safe, environmentally appropriate, regulation compliant solution for the collection, storage and transportation for recycling of Used Lead Acid Batteries (ULABs). At the core of this service will be the Positive Pallet which is a specially designed, enclosed, banded, signed, front loadable, collapsible, dangerous goods Pallet.	<a href="http://www.positiverecycling.com.au">www.positiverecycling.com.au</a>
PTronik	The pMC Master Controller is an Environmental Dust Management System, developed by Ptronik, to significantly improve efficiency in Industrial Dust Collectors. The 'pMC' is a breakthrough technology that collects and uses real time plant data to automatically monitor and control the cleaning process thereby optimizing plant performance.	<a href="http://www.ptronik.com">www.ptronik.com</a>
Q Solar	Q Solar's high efficiency solar heaters have multiple applications in industry, agriculture and for heating of all size buildings. The new solar heaters are easy to retrofit to existing fuel burners and can be used to preheat the air of combustion and decrease fossil fuel consumption and pollution.	<a href="http://www.q-solar.com">www.q-solar.com</a>

Company	Company Overview	Website
QuickCool Cooling Technologies	Our concept is an efficient thermal storage system for medium temperature (0 to 8 dg) commercial refrigeration applications using phase change materials (PCM). During the night in low ambient temperature a standard refrigeration plant will freeze the PCM material within the thermal storage unit reducing energy demand and costs.	<a href="http://www.alltechrefrig.com.au">www.alltechrefrig.com.au</a>
Reposit Power	Reposit Power has developed a 'Batteries-as-a-Service' platform to enable electricity retailers to put a battery in every home to solve a battery of technical and commercial challenges faced in the electricity grid. The Reposit Power platform manages residential energy storage to deliver energy, power and other services that create savings and produce additional revenue streams for retailers and consumers in the National Electricity Market (NEM).	<a href="http://www.repositpower.com">www.repositpower.com</a>
Samec	SAMEC is developing wirelessly connected, solar powered, devices that are part of an 'internet of things'. The first is My Free Power, which integrates a smartphone app, Bluetooth technology and the latest organic photovoltaic solar cell technology in a smartphone protective case. The product will share information about the user's power savings via social media by showing the amount of CO2 savings taking place and promotes peer networking to increase power savings and help market the product.	<a href="http://www.samec.com.au">www.samec.com.au</a>
Silenceair	Silenceair has developed an award winning technology platform that targets the rapidly expanding 'Green Building' ventilation market, currently estimated to be worth \$15 B in the USA alone. Our products enable architects, engineers and builders to create low cost, energy efficient, fresh air ventilation systems for buildings in noise-affected environments that would otherwise require expensive and energy hungry mechanical systems to provide the necessary ventilation.	<a href="http://www.silenceair.com">www.silenceair.com</a>
SmartBurn International	The SmartBurn device is a combustion catalyst for wood heaters. Based upon a mixture of natural, non-toxic and non-corrosive ingredients the SmartBurn device improves the combustion efficiency of wood heaters and open fireplaces resulting in a 54% reduction in wood particulate emissions from entering the atmosphere and a 17% more effective burn of wood.	<a href="http://www.smartburn.com.au">www.smartburn.com.au</a>
Uniflow Power	The Uniflow Generator is biomass fuelled, steam driven engine that produces 5kW of electricity, rotary mechanical power, steam, hot water, and other heating services. It is a 21st century steam engine that can be fuelled with the lowest grade fuels to produce renewable energy services on demand.	<a href="http://www.pritchardpower.com.au">www.pritchardpower.com.au</a>
Utilitas	Utilitas partners with farmers, food and beverage manufacturers, waste managers, and wastewater treatment plant operators to recycle energy from their organic waste streams to cap their increasing energy costs. Utilitas, a specialist biogas project development company, uses well proven technology and a smart business model to produce competitively priced 'Organic Energy'.	<a href="http://www.utilitas.com.au">www.utilitas.com.au</a>
ZEN Energy Systems	ZEN has developed a range of 'Intelligent Distributed Energy Storage' systems from Residential to Utility Scale based on a distributed computing architecture that allows for joint participation by all parties. The core is a world leading 'Battery Operating System' (BOS3) that enables a high level of functionality and control together with advanced battery optimisation of large format lithium iron phosphate cells to break through previous cost barriers to storage.	<a href="http://www.zenhomeenergy.com.au">www.zenhomeenergy.com.au</a>

Company	Company Overview	Website
Zeobond	E-Crete™ is a geopolymer based binder that delivers up to 80% CO2 emission savings compared to Portland cement and is capable of meeting the maximum Green Star Concrete Credit performance criteria. E-Crete meets all of the performance requirements of standard N-Grade concretes under AS 1379 and is specified in VicRoads section 703 for General Concrete Paving.	<a href="http://www.zeobond.com">www.zeobond.com</a>

## 2012 Finalists & Semi Finalists

Company	Company Overview	Website
<b>WINNER</b>		
enLighten Australia Pty Ltd	enLighten Australia designs and supplies highly efficient LED lighting for commercial, industrial and residential strata applications, reducing energy consumption by up to 93% compared with traditional fluorescent lighting.	<a href="http://www.enlighten.com.au">www.enlighten.com.au</a>
<b>RUNNERS-UP</b>		
Polymeric Powders	Polymeric Powders I has developed a high-tech process to turn end of life tyre waste into a high value very fine devulcanised and activated rubber powders that can be used to economically replace virgin material in the manufacture of high end products in the areas of rubber, plastics and elastomers.	<a href="http://www.polymericpowders.com">www.polymericpowders.com</a>
Biofiba Ltd	Biofiba is a composite comprising 100% natural organic matter sourced from commercially grown, renewable, non-food crops processed and extruded into a simulated timber plank as an alternative to timber, plastic, cardboard and polystyrene in the manufacturer of biodegradable export shipping pallets.	<a href="http://www.biofiba.com">www.biofiba.com</a>
<b>FINALISTS</b>		
Silicon Fertilisers	Silicon Fertilisers has developed an innovative product (MaxSil) from post-consumer waste glass which will reduce the amount of waste being taken to landfill and can be used to significantly increase plant nutrient uptake and increase crop yields by up to 25%. MaxSil has also demonstrated the capacity to reduce carbon intensive phosphate inputs by up to 50%.	<a href="http://www.maxsil.com.au">www.maxsil.com.au</a>
Aeratron Pty Ltd	Aeratron has developed a new fan design with increased airflow efficiency that reduces energy use by up to 50% on air conditioning, creates reduced noise and can be retrofitted.	<a href="http://www.aeratronaustralia.com.au">www.aeratronaustralia.com.au</a>

Company	Company Overview	Website
SkyCool Pty Ltd	SkyCool manufactures a cool-roof coating reduces the internal temperatures of buildings, such as shopping malls, airports and warehouses to below ambient, typically saving 30-50% of a building's air-conditioning energy giving IRRs of 25-100%.	<a href="http://www.skycool.com.au">www.skycool.com.au</a>
Tropiglas Technologies Ltd	Tropiglas Technologies Ltd is developing energy-generating clear glass technology that will have market entry as a clear low-emissions glass for the automotive and building industries. The technology blocks IR and UV radiation and associated heat whilst allowing visible light through.	<a href="http://www.tropiglas.com">www.tropiglas.com</a>
<b>SEMI-FINALISTS</b>		
Active Bio-Culture Pty Ltd	Active Bio-Culture Pty Ltd has developed a cost-effective and energy efficient aeration device (Aeralif) to achieve water and wastewater aeration for multiple applications with reduced capital and operating costs and also reduced energy consumption.	<a href="http://www.activebioculture.com.au">www.activebioculture.com.au</a>
Bennett Clayton	Bennett Clayton provides high efficiency onsite generation using multiple small-scale gas generators that switch on and off with demand and operate at peak efficiency and have the capability of also being used for cogeneration.	<a href="http://www.bennettclayton.com.au">www.bennettclayton.com.au</a>
Casafico Pty Ltd	Casafico's walling and construction systems are an innovative combination of latest technology materials and unique construction methods that are able to utilise industrial land-fill waste to produce high quality, low cost, energy efficient construction.	<a href="http://www.casafico.com.au">www.casafico.com.au</a>
CINTEP Pty Ltd	CINTEP make showers that use 70% less water and energy than conventional showers without reducing flow rate, water temperature or time spent in the shower. The product provides a 70% reduction in water and energy consumption in a package with an average payback of 3 - 4 years at current utility prices.	<a href="http://www.recyclingshower.com.au">www.recyclingshower.com.au</a>
ELE Australia Pty Ltd	ELE Australia has developed a concentrating solar solution utilising fresnel lenses and combined with biogas to provide a complete solution initially to the intensive animal farming sector.	<a href="http://www.ele-australia.com.au">www.ele-australia.com.au</a>
Elemental Energy Technologies	The SeaUrchin™ hydro-kinetic Turbine is designed to economically capture the vast energy of the world's ocean streams, tidal currents and river flows for the generation of electrical power. The SeaUrchin™ technology harnesses up to four times more power, is up to 70% more efficient and costs less than conventional "propeller" based marine generators.	-
Energy Saving Networks Pty Ltd	The Wattwatchers technology is an energy monitoring system that allows consumers to be involved in large scale demand-side participation. This allows consumers to control their power bills over smartphones and PC's, enables new forms of energy services to flourish based on aggregation or profiling, and community-based energy saving networks to form.	<a href="http://www.wattwatchers.com.au">www.wattwatchers.com.au</a>

Company	Company Overview	Website
Environmental Sciences Australia Pty Ltd	The SkyVent - SeaBreezer product is a wind directional skylight ventilator that combines daylight and natural ventilation in the one product It uses a innovative wind directional exhaust ventilation system connected to a light pipe using no energy at a low cost to create a healthy house.	<a href="http://www.envirosciences.com.au">www.envirosciences.com.au</a>
GenesisERT	GenesisERT has developed a highly efficient micro-hydro technology that generates electricity from waste kinetic energy from movement of fluid through pipes and is 50% more efficient than existing micro-hydro units.	-
GreenSync Pty Ltd	GreenSync has developed a demand response platform which enables electricity retailers to offer their commercial and industrial customers money for reducing power usage during critical periods by switching off non-critical equipment when requested in return for incentive payments.	<a href="http://www.greensync.com.au">www.greensync.com.au</a>
H2O Organiser Ltd	H2O Organiser technology provides control systems to stop water loss by monitoring flow and automatically stopping flow for detected unwanted flows.	<a href="http://www.h2ostoptheflow.com.au">www.h2ostoptheflow.com.au</a>
Intelligent Software Development	ISD's SimuAlt simulation program operates in the field of advanced data analytics, using simulation and artificial intelligence technologies to provide mass-consumer-based forecasting and decision-support tools to assist business and Government with strategy and policyfor energy and smart grids, water, waste and environmental policy.	<a href="http://www.isdanalytics.com">www.isdanalytics.com</a>
Intresto Pty Ltd	Intresto's Rocksolver is building material optimisation software. Rocksolver solves the jigsaw puzzle when building with irregular-shaped blocks of unprocessed rock to make it easy to use this cheap, abundant and sustainable resource.	<a href="http://www.intresto.com.au">www.intresto.com.au</a>
Katrú Eco-Inventions Pty.Ltd.	Katrú Eco-Inventions has developed the IMPLUX Wind Power Turbine that provides an efficient, tailored, safe and aesthetically compatible small wind solution.	<a href="http://www.katru.com.au">www.katru.com.au</a>
nDure Technologies Pty. Ltd.	nDure Technologies is developing a technology that helps diesel burn more completely to reduce pollutants and enhancing fuel efficiency.	<a href="http://www.nduretec.com">www.nduretec.com</a>
Recycling Solutions Pty Ltd	A range of small manual Plastic Bottle Crushers that will crush all plastic bottles, aluminium and steel cans designed to be used in homes and the commercial industry. By reducing the waste volume, the product helps make recycling more viable.	<a href="http://www.plasticbottlecrusher.com">www.plasticbottlecrusher.com</a>
Rotary Heat Exchangers	Rotary Heat Exchangers has developed an enthalpy or total energy rotary heat exchanger for use to provide high efficiency air conditioning in humid climates. This is being extended for application in all climates with potential energy reductions of up to 50%.	<a href="http://www.rotaryheatexchangers.com">www.rotaryheatexchangers.com</a>
Silenceair International Pty Ltd	Silenceair's technology provides soundproof ventilators for buildings and machinery that reduce noise levels by over 85% whilst allowing air to enter buildings with very little resistance.	<a href="http://www.silenceair.com">www.silenceair.com</a>

Company	Company Overview	Website
Smart Roof Australia Pty Ltd	Smart Roof Australia has developed a solar thermal heating, cooling and ventilation system known as Smartbreeze, which is able to save up to 40% on heating and cooling bills by using radiant warm air to heat a building on a cool day and provide purging and natural nocturnal cooling to assist cooling a building on and after a hot day.	<a href="http://www.smartroof.com.au">www.smartroof.com.au</a>
Solar Dwellings	Solar Dwellings has developed Energy Efficient Refrigerator that changes the concept of refrigeration for domestic and commercial use through having a number of separate air-tight drawers that are opened independently to reduce unnecessary energy loss.	<a href="http://www.solardwellings.com.au">www.solardwellings.com.au</a>
Switch Automation Pty Ltd	Switch Automation has developed the Switch Smart Hub, a cloud based building management system for buildings and communities that can integrate renewable energy management and is provided on a software-as-a-service solution.	<a href="http://www.switchautomation.com">www.switchautomation.com</a>
Tat-G Corp Pty Ltd	The Tat-G On-Site Organic Digester is a commercial-scale organic waste processing system using advanced vermiculture technology and capable of handling a variety of organic materials in combination with cardboard packaging materials.	<a href="http://www.ecco-technologies.com">www.ecco-technologies.com</a>
Timbercrete Pty Ltd	Timbercrete has developed a low emissions masonry product utilising waste timber feedstock that can replace many brick and concrete applications. The product is easier to construct, more versatile, better insulating and reduces waste to landfill.	<a href="http://www.timbercrete.com.au">www.timbercrete.com.au</a>

## 2011 Finalists

Company	Company Overview	Website
<b>WINNER</b>		
Smac Technologies	SMAC Technologies' Shaw Method of Air Conditioning (SMAC) is a patented and proven highly energy efficient, low costing air conditioning (AC) technology with results from over 40 installations showing reduced AC energy consumption of between 30% and 85%.	<a href="http://www.smactec.com">www.smactec.com</a>
<b>RUNNERS-UP</b>		
SolMax	The SolMax combines existing roofing and solar products to produce a cheap, efficient solar concentrator that can be retrofitted and delivers heat, cooling and electricity to commercial premises at the lowest cost.	-

Company	Company Overview	Website
Clean Oil Services	Clean Oil Services' LubeMaster utilises a centrifuge technology to provide ongoing cleaning of oil in a more efficient way than standard pore membrane filters.	<a href="http://www.cleanoilservices.com">www.cleanoilservices.com</a>
YellowDot Energy	YellowDot Energy has developed Australia's largest solar high-flow groundwater extraction system bore based on a proprietary control algorithm to operate the motor in such a way that we can achieve maximum possible shaft speed (and pumping volumes) given the available solar energy incident on the PV array at any moment in time.	<a href="http://www.ydot.com.au">www.ydot.com.au</a>
<b>FINALISTS</b>		
AquaGen Technologies	AquaGen's SurgeDrive wave energy system overcomes the historical problems of wave energy by converting the energy above water and provides a solution that is scalable and cost competitive with other renewable energy sources.	<a href="http://www.aquagen.com.au">www.aquagen.com.au</a>
AquaHydrex	AquaHydrex is an inexpensive, integrated solar-powered water-splitting technology that enables onsite manufacturing of hydrogen for use in industrial processes.	-
MOES	The Calcination Energy Storage system provides an energy storage solution that combines conventional molten salt technology with the chemical dissociation reaction of lime calcination to deliver an order of magnitude increase in energy storage capacity per unit volume.	-
Cogen Microsystems	Cogen Microsystems is developing a hybrid solar energy system for household and commercial application using a heat engine and low cost solar thermal collector to generate electricity and hot water at lower installed cost than competing technologies. This system is commonly referred to as a micro combined heating and power (mCHP) product.	<a href="http://www.cogenmicro.com">www.cogenmicro.com</a>
Ducane Australia	The Drainwave is a simple device that can be installed in any house that enables the use of low flow water appliances such as ultra-low flush toilets. It enables this through capturing water through a 'tipping bucket' design and then using pulse flushes to ensure the low flows can pass through conventional plumbing.	<a href="http://www.drainwave.com.au">www.drainwave.com.au</a>
RESA Operations	RESA's Eco Whisper Turbine is a unique virtually silent 20kW horizontal axis wind turbine for on and off grid connections that utilises a unique blade design and an outer cowling/ring to ensure optimum energy capture and conversion.	<a href="http://www.resau.com.au">www.resau.com.au</a>
Sundermann Water Power	The patented bi-directionally Sundermann low-head water turbine has been specifically designed to maximise operational efficiency in slow water flows to open up new viable locations for tidal and run-of-the river flows.	<a href="http://www.sundermannwaterpower.com">www.sundermannwaterpower.com</a>