



Conference Paper

Striving for a Cleantech Future, One Product at a Time

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Abstract

Geelong is one of Australia's fastest growing cities. It faces significant social, environmental and economic challenges as it transforms into a city of the 22nd century. With its strong growth; proactive business, industry and community groups; and commitment to working together in an innovative culture, the city is ideally placed to take on the challenges of a comprehensive response to making Geelong more resilient. Cleantech Innovations Geelong is an alliance of business, industry, government and academia looking to develop markets for cleantech goods and services. Our aim is to establish Geelong as a Centre of Excellence for cleantech in Australia, by attracting investment, creating jobs and building skills. The program is a partnership funded through the Manufacturing Productivity Network (State Government), the Geelong Manufacturing Council and Future Proofing Geelong (City of Greater Geelong).

Clean Technologies are defined as economically viable products, services and processes that harness renewable materials and energy sources, dramatically reduce the use of natural resources and cut or eliminate emissions and wastes. This paper (and presentation) will feature three case studies which illustrate how businesses are establishing collaborative partnerships to innovate and diversify into new markets for cleantech goods and services.

Keywords: cleantech, clean technologies, energy efficient, industrial lighting, tender, recreational bridges, innovation, food waste, biodigester, manufacturing

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1 Introduction

Since its launch in 2013, Cleantech Innovations Geelong has provided a focus for businesses in Geelong looking to establish their next generation of innovation. Feedback from Cleantech Innovations Geelong members indicates a number of opportunities for businesses and industry to collaborate on product and service innovations. These innovations will enable businesses in Geelong to create jobs, build skills and increase turnover.

Cleantech Innovations Geelong will improve the productivity and competitiveness of participating businesses and industry, by facilitating the delivery of strategically

planned projects which secure market development opportunities. Projects have been identified to support manufacturing and engineering, green buildings and environmental product and service providers.

With Manufacturing Productivity Network Program funding, secured in 2014, Cleantech Innovations Geelong now facilitates a robust level of support to stimulate demand for cleantech goods and services, and develop the market to respond to this increased demand.

Cleantech Innovations Geelong is a collaboration between the Geelong Manufacturing Council, Future Proofing Geelong and the State Government. The Geelong Manufacturing Council is a non-political not for profit organisation funded by industry partners who wish to promote the region as a dynamic and innovative manufacturing centre of the future.

Future Proofing Geelong is a collaboration of business, industry and community groups working to support new and existing initiatives that contribute to a more sustainable, livable and productive Geelong.

The services available through Cleantech Innovations Geelong include:

- Brokerage: to bring buyers and sellers together
- Facilitating collaborative projects: to deliver Market Development Plan outcomes
- Facilitating Procurement for Innovation*: to stimulate demand for cleantech goods and services
- Facilitating export opportunities: to develop business opportunities
- Facilitate skills and capability activities: to improve cleantech skills
- Deliver marketing and events: to raise the profile of Cleantech Innovations Geelong

Small pump-priming grants are also available to help businesses undertake market development activities.

The Cleantech Innovations Geelong Advisory Board, which provides strategic advice for the program, consists of representatives from the Geelong Manufacturing Council, the City of Greater Geelong, CSIRO, Deakin University, the Barwon South West Waste and Resource Recovery Group, the Geelong Performing Arts Centre, Insulpak, clean technologies specialists, and observers from AusIndustry and the Department of Economic Development, Jobs, Transport and Resources.

2 Procurement for Innovation

One of the game-changing services to be provided through Cleantech Innovations Geelong is procurement for innovation (also known as forward commitment procurement).

This innovative method stimulates market demand and supply through public procurement. Using the substantial buying power of public sector procurement, this method is a way to move markets to more cleantech options. Essentially, a public sector procurer establishes a forward commitment to procure a product to respond to a need, which is not yet available on the market. The forward commitment can be up to 3 years in the future. By making this commitment, suppliers on the market are assured that if investment in research and development of a response to an unmet need is undertaken, there is a commitment to procure when the public sector buyer goes to tender.

In the United Kingdom (UK), Her Majesty's Prison Service was spending substantial portions of its annual budget on managing the waste generated from routine mattress replacement. Therefore, a forward commitment was made to procure zero waste mattresses from the market¹; an innovation which was not already available on the market. This forward commitment had a three year deadline. This gave the market the time to research and develop the manufacture of a zero waste mattress which, when HM Prison Service went to tender, the market was able to respond; and a zero waste to landfill mattress is now being procured under contract.

3 Project synopsis

3.1 Procurement for innovation project – recreational bridges

The City of Greater Geelong is using its procurement process to establish an innovative solution for use in recreational spaces - zero maintenance recreational bridges with a 100+ year design life. The Council owns and manages over 160 bridges, many of these are timber, concrete and steel pedestrian bridges which are in various conditions and present an ongoing maintenance liability for the City.

The eight suppliers who have expressed an interest in this procurement exercise have been supported by Cleantech Innovations Geelong to research and develop a solution to the unmet need identified. Links are also being made with Geelong based engineers, designers and manufacturers to stimulate economic growth through this procurement exercise.

3.2 CLOey trial: household food waste processing unit

Moving beyond recycling, reducing greenhouse gas emissions and creating a more sustainable region, while diverting residential food waste from landfill is this project's unique selling points.

¹https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32438/11-996-case-study-fcp-in-practice.pdf

Food waste and other compostable organic materials account for almost 60% of household rubbish and it is important to keep this valuable resource out of landfill. To tackle this problem, a trial of a domestic household composting unit, called CLO'ey, was conducted in 50 households throughout Geelong. The unit converts household food waste into nutrient rich soil conditioner within 24 hours. The trial was heavily oversubscribed and feedback from residents about how easy the unit is to use, was overwhelming. Resident feedback also provided valuable insights into how the product can be improved for the Australian market through design. And the reduction of food waste going into the rubbish bin is impressive.

3.3 Energy efficient industrial lighting

Dramatic savings could be achieved through intelligent controls in LED Lighting. LED lighting is beneficial because of its ability to instantly turn on and dim with no detrimental effect to life time or performance. This is not consistent with existing inefficient light forms; which diminish in performance and reliability when repeatedly turned on and off and dimmed.

This is where Integrated Intelligence plays a role in turning future retrofit projects and new installs into a smarter way of controlling lighting. Ultimately this offers the lowest possible total operating cost to the end user and creates the lowest possible carbon emissions contributed by lighting.

Currently, ESIC Lighting has installed control systems at two locations to view the savings associated with intelligent control. Savings will be achieved by dimming the lamps when sufficient ambient light is present and by dimming lamps when a space is unoccupied. The existing installations use Bluetooth technology to adjust the settings of each lamp from an Android device (phone).

The ultimate goal for this project is to offer a lighting control product which contributes to energy savings for any LED Lighting upgrade within commercial/industrial facilities. The product is easily configured using a tablet and will also be suited to typical existing lighting control protocols (0-10VDC) found in many lamps today (especially LED lamps).



Figure 1: existing bridge (image courtesy of City of Greater Geelong).



Figure 2: visionary bridge (image courtesy of internet search of innovative bridges).

4 Images

4.1 Procurement for innovation project – recreational bridges

4.2 CLOey trial: household food waste processing unit

4.3 Energy efficient industrial lighting

5 Results

5.1 Procurement for innovation project – recreational bridges

- Support is now being provided to the eight suppliers requiring support to bring their innovative recreational bridges to tender.



Figure 3: CLOey unit in household kitchen (image courtesy of Closed Loop).



Figure 4: Energy efficient, wirelessly controlled, industrial lights (image courtesy of ESIC Lighting).

- The Tender will be released in May 2017, for first bridge installation during the 20017/18 financial year.

5.2 CLOey trial: household food waste processing unit

- The next phase of this project is to establish more demand for the product. If this can be achieved, the supplier is looking to shift the manufacturing of the units from Asia to Geelong.

- The CLOey unit contributed to approximately a 25% volume reduction in general household waste bins, which participated in the trial

5.3 Energy efficient industrial lighting

- Installations have been completed in Caron Laboratories, Geelong and National Tiles, Melbourne (roll out to all Melbourne stores has been approved).
- Significant savings in lighting consumption, between 84%–92%, compared with previous lighting installed in warehouses.

6 Summary and Conclusion

Cleantech Innovations Geelong has undertaken a market analysis of the market needs in Greater Geelong; a skills audit of manufacturers' ability to meet these needs; and generated a strategic plan (a Market Development Plan), which outlines the gaps and opportunities in the market, and projects which will respond to these gaps and opportunities.

The Top 10 take home messages from the market research and skills and capabilities audit conducted by Cleantech Innovations Geelong are:

- The global trends in clean technology as they relate to Greater Geelong, show dominant growth areas to be clean cities, renewables, energy efficiency, waste management & recycling, water, green buildings, biomaterials, biofuels and stimulating demand for clean technology goods and services
- The multiplier effect of medium technologies (as opposed to low or high technologies) is for every 1 job created, anywhere from 2 to 6 peripheral jobs will be generated
- Greater Geelong has a diverse economy and current employment growth is being driven by Health Care and Social Assistance, Construction, Public Administration & Safety, Education & Training, and Accommodation & Food Services
- Manufacturing remains one of the region's top four employers however, the recent decline across a number of manufactured product categories (the greatest being in motor vehicle manufacture) has had ripple effects throughout Geelong's economy
- Developing a clean technology driven growth economy relies on the technical services and production businesses we already have, which are looking for their next opportunity to diversify their markets
- Developing and expanding cleantech market opportunities will require investment and a broad range of business capabilities

- There are opportunities for businesses to adapt their existing operations and create new business opportunities individually or through alliances
- Education and training programs need to follow the demand stimulation exercise of Cleantech Innovations Geelong (and not occur in isolation of it) and we need to embed cleantech training into existing training programs
- Developing markets for cleantech is not about green or cleantech jobs, but rather 'greening work'
- We have a number of transferable skills in Geelong. In addition, there are opportunities for topping up skills we already have (e.g. developing more green skills amongst plumbers and electricians); and developing more cleantech skills within management, procurement and architecture

The projects identified in the Cleantech Innovations Geelong Market Development Plan focus on those which expand businesses, create/maintain jobs and develop skills throughout Greater Geelong. They represent projects which are striving for a cleantech future, one product at a time.