



## **PhD Scholarship**

***Life Cycle Engineering & Management Research Group***

***School of Mechanical & Manufacturing Engineering***

***The University of New South Wales***

### **SUSTAINABILITY COCKPIT: AN INTEGRATED TOOL FOR ASSESSMENT AND IMPROVEMENT OF SUSTAINABILITY IN MANUFACTURING**

Two APAI PhD scholarships are available to work on a recently commenced ARC Linkage Project (2012-2014) in which the impact of decisions on Energy, Water, Carbon footprint on Australian Manufacturing will be examined. Manufacturing requires resources such as raw materials, water and energy to achieve the transformation process. Consumption of these resources is naturally highly dynamic depending of the state of the manufacturing system. A manufacturing plant consists of complex and dynamic systems of production machines and technical building services. The majority of the factories have been built in the past without giving much consideration to the manufacturing process taking place in the factory; hence they are highly inefficient in terms of water and energy consumption. This problem has been magnified recently due to the dramatic increase in the cost of energy and water, and the lack of understanding of the direct link between energy and water consumption and the associated environmental impact.

This project, in collaboration with the partner organisations ALCOA Rolled Products Pty, FIP Breaks Australia, PLP Preformed Line Products Australia, IFU Hamburg Germany and TU Braunschweig Germany, will involve investigation into the modelling of manufacturing systems and the analysis of the impact of decisions on Energy, Water and Carbon footprint of a business. The result of this analysis should be a modelling platform that allows for the analyses and improvement of manufacturing systems on the cost, lead time and environmental foot-print of the business. The proposed approach will lead to the development of a software solution to increase the efficiency of Manufacturing in Australia. The objective of PhD projects advertised will focus on the development of a Petri net-based process model which will then be linked to the companies' value-stream map in order to evaluate the link between traditional business objectives such as cost, lead time, throughput and the environmental objectives such as CO<sub>2</sub> footprint.

The project will be undertaken through the Life Cycle Engineering Research Group @ UNSW ([www.lceresearch.unsw.edu.au](http://www.lceresearch.unsw.edu.au)). There will be substantial collaboration with the partner organisations. It is expected the successful candidate will spent substantial amount of time at the industry during the course of the project.



Applicants should hold an undergraduate degree of at least Honours 1 or 2A standard or equivalent in Mechanical and Manufacturing Engineering. An experience with manufacturing environment will be an advantage. This project will provide the selected candidate with valuable experience in sustainable manufacturing.

### *Details*

A stipend of \$27,222 per annum (tax free) will be provided for three years. Additional taxable support of up to approx. \$10,000 per annum may be available through acceptance of tutoring duties within the School of Mechanical & Manufacturing Engineering for the suitable candidates. Australian citizens, Australian permanent residents and foreign nationals may apply for this scholarship.

Further information on the project and scholarships on offer may be obtained from A/Prof. S. Kara ([S.Kara@unsw.edu.au](mailto:S.Kara@unsw.edu.au)).

Applications for the scholarship should include the following:

- Cover letter;
- Academic transcript and/or record;
- CV; and
- Names and contact details of two referees.

These documents should be submitted to A/Prof. Sami Kara, School of Mechanical and Manufacturing Engineering, University of New South Wales, Sydney NSW 2052, Australia.