edge environment

Research Paper Summary "Industrial Ecology in New South Wales"
- by Viviane Clément

1 Introduction

Australians are among the world's highest waste producers, generating 32.4 million tons of solid waste, of which 54% is disposed to landfill each year. New South Wales in particular accounts for over 6 million tons of landfill waste each year.

Since its introduction in academic circles in the mid-1980s, Industrial Ecology (IE) has had a progressively growing "buzzword effect." By seeking to mimic the efficiencies found in natural ecosystems through the production and consumption patterns of human industrial systems, IE promotes enhanced sustainability by enabling the development of innovations in the use and reuse of waste materials. The wastes or by-products of one industry are used as an input in another industry, thereby closing the material loop of industrial systems. The concept is currently evolving from the traditional, purely park-based approach and has led experts to suggest that incremental adoptions of IE principles, coupled with a more regional approach may be the most effective.

It is in this context that the potential for the development, led by industry demand, of an IE network in NSW under the auspices of the NSW Department of Environment and Climate Change's Sustainability Advantage Program (SA Program) is a viable and innovative project. The Program is a government-business partnership that aims to help companies integrate environmental and sustainability goals in their business practices. The Program's existing framework is a promising "incubator" for an IE network with a number of systems already in place that have proven crucial for a successful network, from the division of member companies into clusters to the presence of a strong core of manufacturing industries.

2 The Case for IE in NSW: Starting with the Sustainability Advantage Programme

An IE network in NSW would initially be based within the SA Program Building Products clusters. This will involve material synergy partnerships, or exchanges, between member companies.

In raw material terms, an IE network centered on the Buildings Products clusters can earmark over 200,000 tons of Sydney based building material waste by-products for potential recovery and reuse as alternative raw material, fuel, or supplementary cementitious materials (SCMs), including:

- Up to 85,000 tons of timber waste per year (pallets, packaging, and particleboard)
- Up to 30,000 tons of fiber cement per year
- Up to 100,000 tons of recycled glass per year (packaging and commercial windows)
- Up to 30,000 tons of rubber per year
- Potential for collaboration with power generators to recover 6 million tons of fly ash per year as an SCM and/or lightweight aggregate.

edge environment

3 Why a Network in NSW Will Work

3.1 Existing Institutional and Technological Support

- **Co-location.** It is a crucial component in terms of the environmental viability of exchanges, as these become increasingly environmentally ineffective with increasing transport distances**.** All member companies are located within the greater Sydney metropolitan area of around 100km.
- **3 Proven Levels of IE.** Firm level IE is already occurring through Program modules. Islands of members in the same Sydney neighborhoods take on Integrated Eco-Industrial Park characteristics and the linking of these islands is characteristic of Networked Eco-Industrial Park Systems. The IE network will be strongly rooted in validated IE structures.
- **Key Group of Actors.** These include already active actors that provide the SA Program with technical expertise and support, namely the DECC, consultants, and member company champions.

3.2 An Established Social Arena

- **Clusters.** This format enables the basis for the social arena of contacts, opportunities, knowledge sharing, and networking so essential to maintaining member interest in IE systems. Clusters also provide collective infrastructure and the achievement of the critical mass of waste needed to make IE viable.
- **Champions.** Engaged company champions will continue to play crucial roles, representing the "go-to" people in their respective companies for synergies.
- **Case Studies.** The development of IE case studies is a valuable tool for marketing purposes and for the recruitment of potential members.
- **Flexibility.** The nature of the SA Program allows for innovation and "thinking outside the box" in terms of resource recovery, while respecting the organizational and institutional contexts in which companies operate.

3.3 Achieving Both Business and Environmental Objectives

- **Low-hanging Fruit First.** Projects that companies have been working on through Program modules represent the low hanging fruit of IE. These have helped to increase environmental performance with economic benefits down the line. These relatively low-risk internal measures are deemed essential to progressing gradually into IE exchanges.
- **Waste arrangements.** Several options are possible here depending on the needs of the company and type of synergy, including shared cost options and even no charge options. It is important to keep in mind that main economic benefits should come from reduced disposal to landfill costs and reduced input costs. Any gains from potential revenue generated from selling wastes can be a definite benefit, but the creation of financial incentives to create more waste should be avoided.
- **Regulation.** It represents one of the main drivers in resource recovery initiatives. In the context of waste regulation and the upcoming Carbon Pollution Reduction Scheme, an IE network can be

an important resource for member companies to ensure compliance while turning efforts into tangible benefits

- **Competitive Edge.** Demonstration of successful synergies in resource recovery can serve as a concrete basis of a company's competitive edge and possible foray into niche markets.

4 Conclusions and Current Efforts

- **Foundations Are Established.** The SA Program has provided members with the social, economical, institutional, and technical means to establish a strong and successful IE network.
- **Material Exchanges Are Underway.** Members are continuing to pursue IE exchange partnerships.
- **Data Collection.** Members are currently completing a data matrix designed to capture data on the flow of materials, and other resources into each company and the flow of products and wastes out of each company. The view is to progressively grow data collection into an interactive online database administered by a third party organization.
- **Incorporation of the AusLCI and BPIC/ICIP project.** Companies can identify the highest life cycle impacts of their materials and use IE as a mode of action to reduce that impact.
- **Looking to the Australasian Industrial Ecology Conference in July 2009.** The evolution and achievements of this budding IE network will be presented. The Conference can also represent a starting point for the launch of the network as an independent, online-based, third-party managed entity.