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Title: **Encouraging sustainable product design – an update on practical New Zealand activity**

Category: Sustainable Technology

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Abstract:

Design and innovation processes are key 'front-of-pipe' drivers towards sustainable industry practice. Sustainable product design (as 'design for the environment') is identified in the New Zealand Waste Strategy as a key element of waste reduction and materials efficiency.

Building on existing partnerships with industry, product stewardship initiatives and sustainable procurement, the Ministry for the Environment is working to make sustainability part of the product design and innovation process. Key aspects of encouraging sustainable product design that have been identified, and are being progressed, include:
-   Networks and workshops to increase awareness among designers, educators and industry leaders;
-   Tools and resources to support sustainable product design and innovation for industry, design professionals, and design school graduates;
-   Showcasing and rewarding good practice (through awards and case studies);
-   Building capacity to deliver sustainable product design and innovation;
-   Introducing environmental aspects to existing and emerging design and innovation initiatives; and
-   Exploring opportunities to encourage path-breaking innovation through research and development futures thinking.

Examples are used to illustrate emerging activity in these key areas. A focus is provided on the positive interest building in industry and the design sector.

Key words: sustainability, design, innovation, sustainable product design

Introduction

The Ministry for the Environment (MfE) provides leadership in New Zealand across government and the community on environment. This includes working to improve sustainable practice in industry. This is vital because the activities of industry can affect our environment through resource use, the use of hazardous substances, waste generation, emissions, discharges and the need for infrastructure.

When looking at the sustainability of industry, design and innovation processes need to be considered. This is because 'front of pipe' decisions made during product design and development can greatly influence a product's life-cycle environmental impact. For example, materials selection may significantly impact upon resource depletion, product toxicity or end-of-life recyclability. Other factors influenced by design decisions may include product durability, energy efficiency, or distribution impacts (Environment Australia, 2001).

It has been estimated that up to 70 percent of the cost of development, manufacture and use of a typical product is determined in its design phase (United States National Research Council, cited in Yarwood and Eagan, 1998). Others have estimated that this same proportion of a product's environmental impact can be influenced during design (EcoRecycle Victoria and Product Ecology Pty Ltd, 2005). This 'cumulative lock-in' of environmental impact arising from decisions made along the product development cycle is illustrated in Figure 1 below.
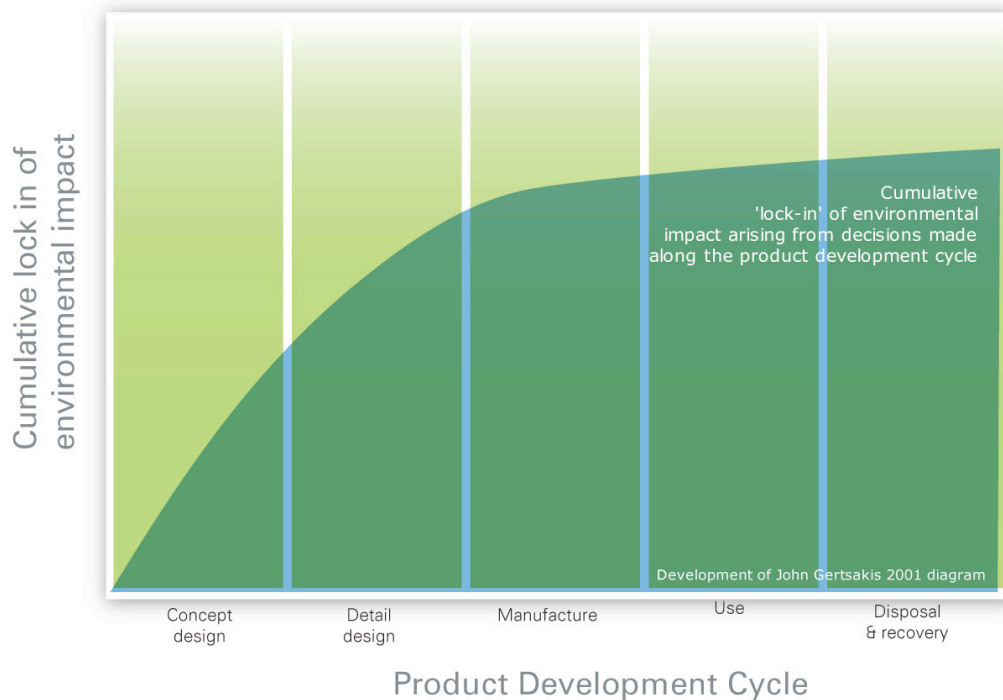

Figure 1 *Cumulative lock-in of environmental impact*
(Locus Research 2006, based on Lewis and Gertsakis 2001)

Sustainable product design (as 'design for the environment') is identified in the New Zealand Waste Strategy (MfE, 2002) as a key element of waste reduction and materials efficiency. Also, noting the ability of design to prevent waste at source and encourage greater levels of product reuse and recycling, the Strategy states "products and substances should be designed, produced and managed so all environmental effects are accounted for and minimised during generation, use, recovery and disposal" (p20).

The breadth of environmental impacts able to be addressed through sustainable product design means that it is also consistent with a range of other central government policy initiatives. These include initiatives to increase energy efficiency and reduce greenhouse gas emissions, such as the National Energy Efficiency and Conservation Strategy (note that a new strategy is being drafted at the time of writing) and climate change policy (MfE, 2006a).

Sustainable product design and the Ministry for the Environment

Recognising all of the above, the Ministry for the Environment is committed to make sustainability part of the design and innovation process. The Ministry has therefore commenced a project in this area, as part of its work helping industry to be competitive, profitable, and grow sustainably (MfE, 2006b). This has been framed under the term 'sustainable product design' (as opposed to alternative terms such as 'eco-design' or 'design for the environment'), to provide consistency across the Ministry's 'sustainable industry' work programmes.

The project aims to increase interest in, delivery, and availability of sustainable product design, and involves resources, capacity building and other non-regulatory approaches (as outlined further below). The project has strong linkages with the Ministry for the Environment's Sustainable Industry Group work under:

- the New Zealand Waste Strategy (MfE, 2002) – which includes the development and implementation of product stewardship initiatives;

- the New Zealand Packaging Accord 2004 (MfE, 2004) - which includes sustainable design as a focus area; and

- the Govt[3] programme (MfE, 2006c) - which includes a range of sustainable procurement initiatives.

Project overview

Building on initial scoping work, the Ministry for the Environment has identified a number of key aspects, or project strands, to be addressed as part of encouraging

sustainable product design. These inter-related strands are intended to help make sense of activity in this area. They include:

- Networks and workshops to increase awareness amongst designers, educators and industry leaders;

- Tools and resources to support sustainable product design and innovation for industry, design professionals, and design school graduates;

- Showcasing and rewarding good practice (through awards, case studies);

- Building capacity to deliver sustainable product design and innovation;

- Introducing environmental aspects to existing and emerging design and innovation initiatives; and

- Exploring opportunities to encourage path-breaking innovation through research and development futures thinking.

Importantly, the above strands are not intended to be mutually exclusive, nor are they intended as areas to be solely worked on, or delivered by, the Ministry for the Environment. Rather, they provide a conceptual framework around which the Ministry's involvement can be geared. This is useful for the Ministry as it has identified its approach in this project as primarily one of partnership, enabling and facilitation, recognising that a robust 'system' to support sustainable design will require actions across a wide group of players.

Progress to date

The Ministry for the Environment's progress to date has been focussed on an initial stage of developing networks and building awareness. And while progress in these areas has been positive, it is in the wider context of partnerships and stakeholder initiatives that the extent of practical activity to encourage sustainable product design begins to emerge. This is illustrated through the examples below.

- In August 2005, the Ministry hosted a successful workshop bringing together around 30 design practitioners, companies, organisations and educators with some sustainable product design experience. The purpose of this workshop was to provide a forum for sharing experiences, resources, networks and initiatives, and to discuss a few key framing questions around moving ahead with sustainable product design (see *Table 1*).

  In addition to indirectly informing the initial stages of the Ministry's project development, this workshop also provided the basis for a 'virtual network' of parties interested in sustainable product design. This virtual network, which has subsequently

grown to over 80 individuals, now regularly receives email updates from the Ministry for the Environment on sustainability and design, providing a dedicated communication channel in this area. This loose group might also provide a useful precursor should a move towards more formal or organised sustainable product design networks (for example, via the 'O2 Network') occur in the future.

Table 1 *Summary examples of discussion at a Ministry for the Environment workshop on sustainable product design, August 2005.*

Framing Question	Example Responses
What are some of the opportunities for moving sustainable product design forward?	- 'Mainstreaming' into existing and emerging design initiatives - Improved understanding of potential benefits of a sustainable approach - Alignment with innovation initiatives and New Zealand's 'clean and green brand' - Make the concept and tools more accessible
What are (and could be) the motivators for sustainable product design for designers, design users (companies) and consumers?	- Market access (especially export) and differentiation - Leadership and values - Legislation and policy trends
What barriers are there to sustainable product design?	- Misperceptions ('green' products = lower quality, more expensive etc.) - Lack or awareness and understanding - Perceived and/or real lack of guidance (e.g. tools, objective criteria) - Incentives
How can sustainable product design be recognised/celebrated?	- Education – e.g. design schools - Industry recognition – e.g. awards - Labels – e.g. Environmental Choice

- Positive progress towards encouraging sustainable product design has also been achieved in partnership between the Ministry for the Environment and the Designers Institute of New Zealand. This has included supporting the Institute's decision to introduce a Sustainable Product Design category into its annual Best Design Awards for the first time in 2006. With the Best Design Awards representing a major event on the domestic design community calendar, the inclusion of a dedicated sustainability category contributes to both 'showcasing and rewarding good practice' and wider design community awareness.

- Guidance, tools and resources have begun to be addressed through the addition of a comprehensive list of sustainable product design resources on the Ministry for the Environment's Simply Sustainable web resource (www.sustainability.mfe.govt.nz). Simply Sustainable is the Ministry's hub of guidance on sustainable business practice, and includes sections on: communication and reporting; environmental management; pollution prevention; product sustainability; resource efficiency; social aspects; and supply chain management.

- Media interest in sustainable product design has also continued to grow. For example, *ProDesign* journal, a key bi-monthly publication in the New Zealand design community and the official journal of the Designers Institute of New Zealand, has introduced a regular 'focus on sustainability' feature (ProDesign, 2006). This is consistent with approaches taken by Australian publications such as *Curve* and *In Design* magazines, and is expected to help raise designer awareness about the relevance of sustainability.

- Additional examples of progress towards more sustainable product design in New Zealand include, but are not limited to:

  - Plastics New Zealand, as part of its Plastics Sustainability Initiative (and supported by the Ministry for the Environment's Sustainable Management Fund), has developed a suite of Eco-design Guidelines. A number of case studies of sustainable product design in the plastics sector have also been documented as part of the Plastics New Zealand Best Practice Programme (Plastics New Zealand, 2006).

  - The Packaging Council of New Zealand has continued to run regular workshops for its members and interested parties on sustainable packaging and design for the environment as part of its commitments under the New Zealand Packaging Accord 2004 (MfE, 2004).

  - The Govt[3] programme to encourage more sustainable practice by central government agencies (MfE, 2006c) has continued to grow, with 47 core agencies now formally signed up to the programme. With government spending at least $25 billion per year, and programme aspects targeting sustainable procurement, buildings, office-consumables and equipment, this initiative has the potential to contribute significantly to market demand for more sustainable products.

  - The number of New Zealand businesses holding, or in the process of qualifying, for Environmental Choice certification in the last year has more than doubled over the year to June 2006, with over 700 products now accredited to use this eco-label.

  - A steering group of New Zealand Life Cycle Assessment (LCA) practitioners has been established to assist the growth of a network in this area. The overall

aims of this LCA network will include to increase education and awareness of LCA among stakeholders (including industry, academia, government, non-government organisations, LCA practitioners, end users and the general public) and to promote product-oriented environmental work in companies (Nebel, 2006).

Looking forward

The Ministry for the Environment has identified a number of focus areas for activity going forward. These include:

- Taking a closer look at existing guidance on sustainable product design, and the extent to which this meets present needs (commencing with a workshop in October 2006).

- Continuing to partner with stakeholders such as the Designers Institute of New Zealand to provide workshops and events to raise awareness around sustainable product design.

- Preparing and disseminating a number of case studies highlighting the benefits of sustainable product design, and demonstrating how it can be undertaken in practice.

- Continuing to build relationships with wider design and innovation initiatives such as the New Zealand Trade and Enterprise-led Better by Design programme, with a focus on mainstreaming recognition of sustainability in design.

Conclusion

With initiatives to encourage sustainable product design consistent with government policy, the Ministry for the Environment has commenced a project to start making sustainability part of the design and innovation process. While the focus to date has been on growing networks and raising awareness, practical activity being undertaken by a range of stakeholders illustrates the positive progress that is being made. This is expected to continue, with the Ministry for the Environment having identified a number of focus areas for future attention. As more work is undertaken in this area, an increased interest in, delivery, and availability of sustainable product design is anticipated.

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