

# Ecodesign Report

Results of a survey amongst Australian  
Industrial Design Consultancies



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Authors:

Johannes Behrisch, Dr. Mariano Ramirez, Dr. Damien Gjurco

## About this report

This report is part of the doctoral research project of Johannes Behrisch at the Institute for Sustainable Futures at the University of Technology, Sydney. Johannes is supervised by Dr. Mariano Ramirez (UNSW) and Dr. Damien Giurco (UTS). The topic of the research project is “Investigating in the role of strategic industrial design consultancies for ecodesign uptake”. It aims at answering the question where industrial design consultancies should direct their efforts to improve ecodesign uptake in the projects they conduct together with their clients. This will not only help industrial design consultancies and their clients to reduce the ecological impact of the solutions they design but also allow industrial design consultancies to extend their business more towards ecodesign services.

## Contact

Johannes Behrisch  
Email: [Johannes.Behrisch@uts.edu.au](mailto:Johannes.Behrisch@uts.edu.au)  
Phone: +61 (0)4 311 28 0 27  
Level 11  
UTS Building 10  
235 Jones Street  
Ultimo  
NSW 2007 Australia



## **Introduction**

Whilst there is increasing focus on pursuing activities which reduce the negative environmental impact of our society, most contemporary product development practice does not devote attention to design products with ecological criteria in mind, an activity usually termed ecodesign.

Industrial designers and in particular industrial design consultancies can play a key role for more ecodesign uptake. Little is known how and how far this potential unfolds in real world product development processes. This report presents findings from a research project, investigating the ecodesign practice of Australian industrial design consultancies. The data was collected via an online survey and supplemented by a previously conducted content analysis of commercial websites of industrial design consultancies. (See also: [http://repository.tudelft.nl/assets/uuid:4648da5c-2ece-421f-824a-9da30ddc3574/301\\_Behrisch.pdf](http://repository.tudelft.nl/assets/uuid:4648da5c-2ece-421f-824a-9da30ddc3574/301_Behrisch.pdf))

## **Methodology**

Commercial websites of Australian industrial design consultancies were identified by using databases, freely available via the internet (Core77, Yellow Pages, Australian Design Awards, Design institute of Australia). To be included in the analysis, the design consultancy needed to have a working website and a clear focus on industrial design had to be visible on the website. Companies, which had a strong emphasis on rapid prototyping, architecture or similar were excluded from the data collection. In total 96 industrial design consultancies were identified and approached via email with the request to participate in an online survey. The response rate of the online survey was 19%. To deliver a comprehensible picture of the ecodesign activities of the entire Australian industrial design community, the findings were supplemented by analysing the capability statements and portfolios on all the identified websites.

## **Involvement of industrial design consultancies in ecodesign activities**

Of the industrial design consultancies, who replied to the online survey, 83 % had worked on ecodesign projects. In total 33 % of the respondents who had not yet practiced ecodesign are promoting ecodesign to their clients without successfully convincing them to invest in their ecodesign services. Only 6 % of the survey-respondents appear to see no potential in offering ecodesign services.

The data from the website content analysis showed a lower ecodesign involvement (45%) among Australian industrial design consultancies than among the survey participants (83 %). The percentage of work of industrial design consultancies, related to ecodesign activities varies greatly between the participants of the survey, ranging from 5% to 80%.

Industrial design consultancies usually work for clients from various industries. The survey revealed that ecological considerations are most frequently included in packaging projects (67 %) and projects for the electronic industry (47 %). (Figure 1)

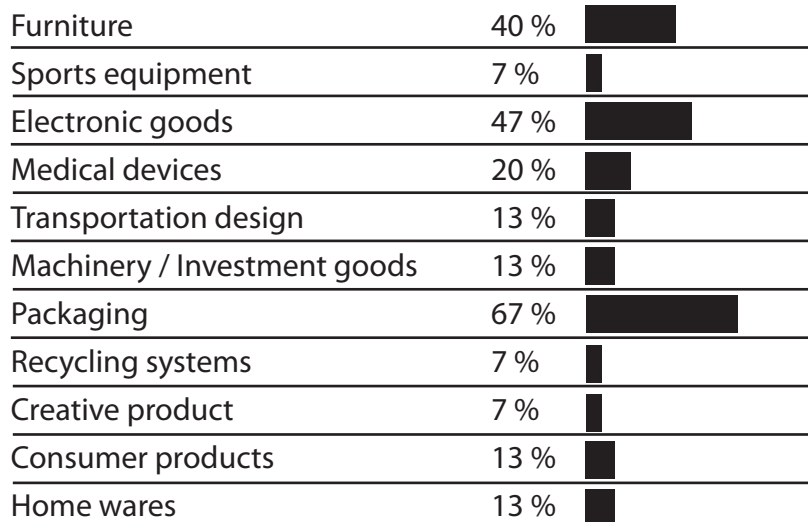


Figure 1: Ecodesign activities of industrial design consultancies per sector (percentages add to more than 100 as companies can work across sectors)

## Popularity of ecodesign interventions

To reduce the environmental impact of a solution, various ecodesign interventions can be followed. An extensive list of ecodesign interventions is published in the manual “Ecodesign: a promising approach to sustainable production and consumption” (1). This list is structured in 8 main categories which have 33 subcategories. As designing is a creative process - always seeking for new ways to solve problems - it is impossible for this list to be complete and exhaustive. For this research, the suggested list was used as a starting point. Whilst the survey allowed participants to suggest additional ecodesign interventions, no further suggestions were listed by respondents. The survey furthermore investigated how frequently clients of industrial design consultancies sought specific ecodesign interventions. The popularity of the ecodesign interventions, sought by the clients varies in the same way as the frequency of application of ecodesign interventions. ‘Optimising the distribution system’ turns out to be the least popular area of intervention, yet the only area where client demand outstripped provision by the consultancy. “Low-impact materials selection” and “Materials usage reduction” turn out to be most popular.

(1) Brezet, H. and Van Hemel, C. (1997). Ecodesign: a promising approach to sustainable production and consumption. Paris: UNEP.

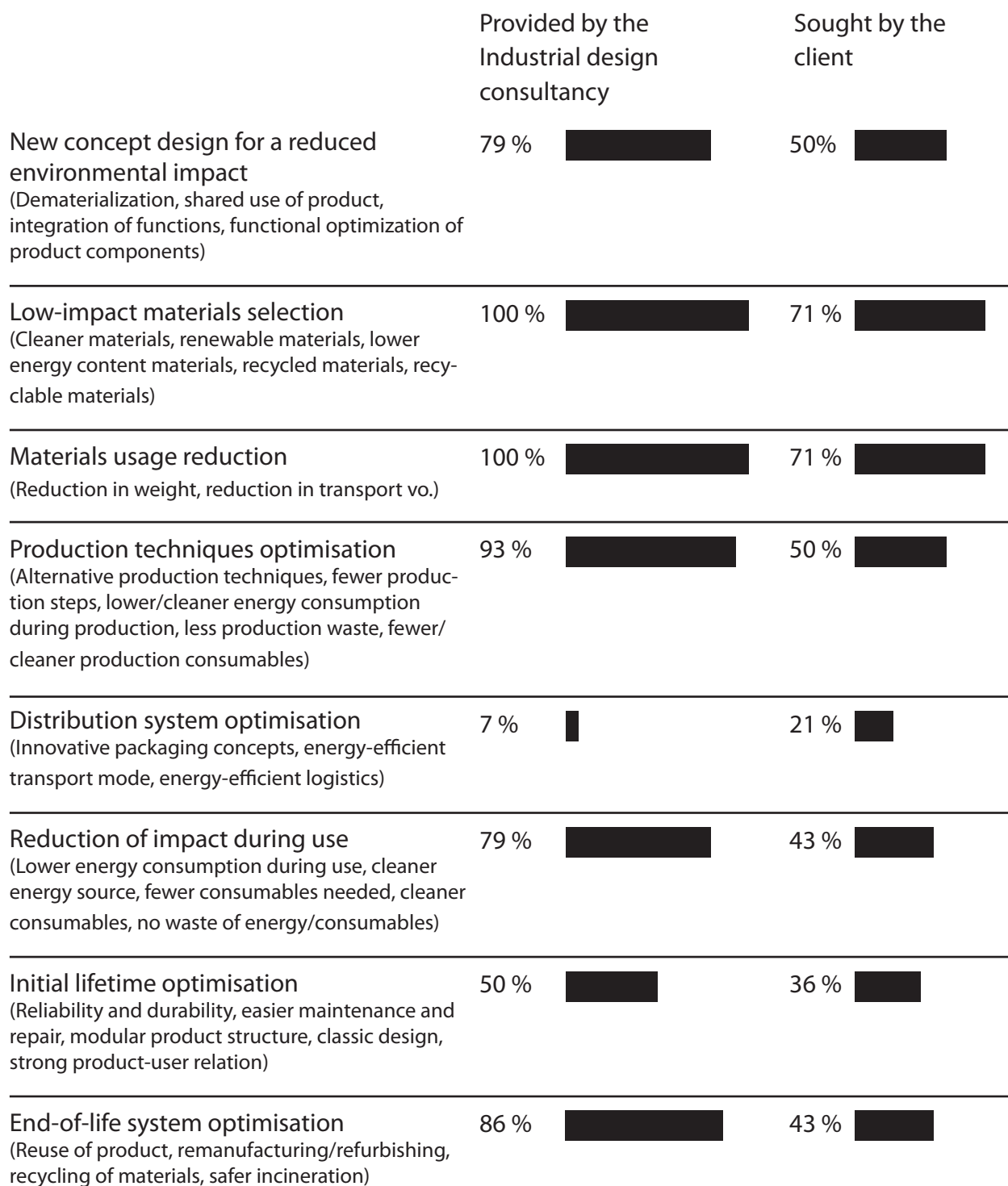


Figure 2: Popularity of ecodesign interventions

## The necessity of life cycle thinking and its application in practice

Ecodesign interventions should not be applied randomly in the hope of an improved environmental performance. To secure a low environmental impact, the choice has to be informed by an understanding of the product's expected physical life cycle, ranging from the extraction of raw materials over the product's production, distribution and use to its final disposal. This activity is termed as life cycle thinking (LCT). To develop the necessary understanding about the product's life cycle, various approaches can be followed, which vary greatly in effort and in the degree of detail they deliver. These approaches can range from running a complete life cycle assessment (LCA) on reference products to just intuition. Depending on the experience of the person, choosing the design intervention, it can be misleading to use less detailed assessment approaches. Especially relying on intuition only brings along a high risk. For example biodegradable materials can, even though they are perceived as being more "natural" than plastic, have a higher environmental impact. An example for this can be found on the website <http://envimpact.org/node/41>, where the environmental load of single use grocery shopping bags made of plastic or paper is compared with single use paper bags. Even though being made from renewable resources and being biodegradable, paper bags are identified as having a significantly worse environmental performance.

Despite this risk, common sense turns out to be the most popular approach for selecting appropriate ecodesign interventions. Together with checklists and guidelines, detailed impact assessments are used least frequently to identify and select appropriate ecodesign interventions.

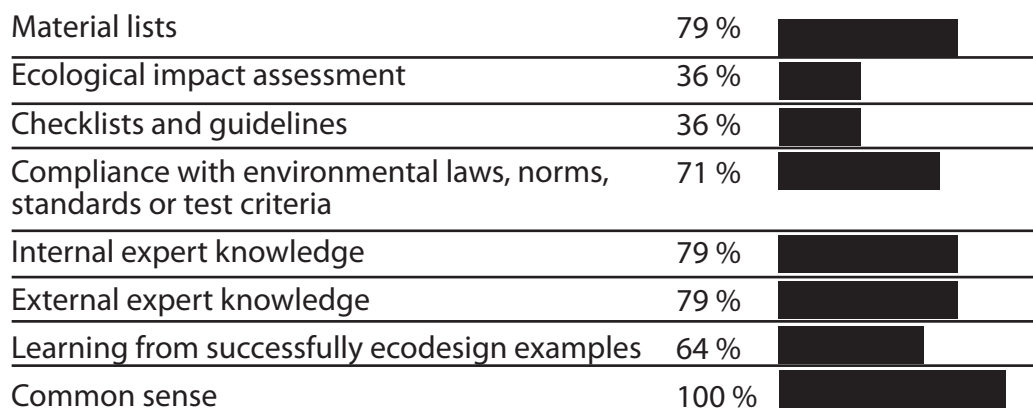


Figure 3: Use of ecodesign support

## Integration of ecodesign in the product development process




Ecodesign considerations have to happen by definition during the product development process. This process can be divided in two main phases (2):

- The product planning phase, which clarifies the main idea that will be developed, and the drivers for doing so
- The strict development phase, which develops a plan for actually making the product

The biggest impact on all the product's properties, including its environmental impact is taken in the product planning phase. It therefore is most beneficial to implement ecodesign early. This also best facilitates mediating potential conflicts between ecological and other requirements as well as best exploiting possible win-win situations. It therefore is important to understand how far industrial design consultancies have influence on this early phase of the product development process.

It was found that 73 % of the survey participants, who conducted an ecodesign project, stated that the ecodesign implementation happened in both phases. Overall, 89 % of the survey-participants state to have some influence on the product planning phase and all of them appear to have influence on the strict development phase. Compared with results from the website content analysis, which identified only 40 % of the industrial design consultancies offering services for the product planning phase, the respondents of the survey have more influence on this phase.

### Involvement of the survey participants in product planning activities (total 89%)

Project definition (business plan, overall product concept, align project and corporate identity)	72 %	
Market definition (target group, market opportunities)	44 %	
Product definition (definition of product functions, modes of use, product semantics)	78 %	

### Involvement of the survey participants in strict development activities (total 100%)






Definition of the product form (2D visualisation, 3D visualisation, mock up, prototype)	100 %	
Engineering of the product (functions, manufacturability)	89 %	
Ensure compliance with norms, standards and legislative framework	67 %	
Manufacturing (Supplier sourcing, Tooling)	89 %	
Distribution	6 %	

Figure 4: Strategic and operational influence of industrial design consultancies

(2) Roozenburg, N. and Eekels, J. (1995). Product design: fundamentals and methods. Hoboken: John Wiley & Sons Inc.

## Ecodesign projects

Participants of the online survey were asked to reflect about one representative ecodesign project. In 43% of these projects, designing an eco friendly product the top priority. In the other projects, ecodesign was of lower importance. In 86 % of the cases, the project was conducted together with a client who played in 58 % of the cases the key role for integrating ecodesign into the product development process. More than half of these clients (60%) are small companies with 2-25 employees. The projects were split between being designed for the national market (45%) and international market (55%).

In 73 % of the cases, the relevant ecodesign information was provided by the industrial design consultancy.

## Advertising of ecodesign services

To convince clients and potential clients of using their ecodesign services, industrial design consultancies can use various different communication channels. Most participants of the online survey state to use individual channels prior to starting an design project for this purpose. Examples are presentations of the company profile (50 %) or project briefing negotiations (56 %). Presenting free extra ecodesign concepts at a later stage of a project (13 %) or taking part in ecodesign competitions (0 %) are least popular. Previous collaboration between the industrial design consultancy and the client (33 %) as well as recommendations (25 %) are mentioned most frequently as beneficial factors to establish the necessary trust in the client company to initiate an ecodesign project.

Several drivers can play a role for implementing ecodesign into the product development process. They are of different importance for the industrial design consultancy and the client company. Figure 5 illustrates the most frequently mentioned driver for industrial design consultancies to take the initiative to practice ecodesign.
















	Client motivation	Consultancy drivers
Ecologically sustainable products as a market opportunity	50 % 	50 % 
Gain practical experience in ecodesign	0 %	17 % 
Compliance with environmental laws, norms, standards or test criteria	33 % 	0 %
Price development on the market for resources	25 % 	0 %
Economic savings (ex. material reduction)	42 % 	0 %
Competitors practice ecodesign	33 % 	0 %
Elevate product quality through ecodesign	25 % 	0 %
Ecodesign as a source of innovations	33 % 	67 % 
Sense of responsibility towards the environment	50 % 	100 % 
Ecological sustainability as an important trend	67 % 	67 % 
New material with great potential	8 % 	0 %

Figure 5: Drivers for ecodesign



## **Evaluation of a representative ecodesign project**

Participants of the survey were asked to evaluate the outcome of an ecodesign project, they would classify as representative. Thereby most of them (92 %) were confident that the project resulted in an ecologically improved performance of the solution. Most projects (92 %) were completed on budget and all of them to the satisfaction of the client (100 %). Most survey participants stated that the project not only intensified their relationship with the client (100 %) but also helps them to attract new clients (92 %). The larger share of survey participants agrees that the conducted ecodesign projects improved the image of the industrial design consultancy (92 %) as well as the image of the client company (100 %).

## **Concluding remarks**

This research has shown that industrial design consultancies can play a role for ecodesign uptake in the product planning phase as well as in the strict development phase and that they and their clients can benefit from this. The ecodesign interventions, applied by the industrial design consultancies mainly reflect the ones, demanded by their clients. Industrial design consultancies mostly appear to use common sense to direct their ecodesign efforts. If they do not have the necessary experience, this circumstance can have negative impact on the appropriateness of the ecodesign interventions they apply. The absence of a detailed and structured impact assessment furthermore makes the environmental benefit of the developed design questionable. In terms of client satisfaction, economical benefit and reputation improvement ecodesign projects are perceived as successful by the industrial design consultancies.

Nevertheless the majority of projects, handled by industrial design consultancies do not include ecodesign. Ecodesign therefore does not appear to successfully diffuse into the everyday praxis of most industrial design consultancies. To develop an understanding how to improve this situation, more detailed insight into real world ecodesign projects has to be gained.

## **Further research**

This research is part of a larger project at the University of Technology, Sydney. It investigates where industrial design consultancies should direct their efforts to increase ecodesign practice and to benefit from actively offering ecodesign as a service to their clients. The next part of the project will pay more attention to the client perspective and investigate the interaction between client-company and industrial design consultancy in greater detail as well as the necessary adaptations which happen in both companies. The data will be collected by conducting various case studies, investigating specific ecodesign projects.