

Institution: University for the Creative Arts
Unit of Assessment: 34 Art & Design: History, Practice and Theory
Title of case study: Eco-Design and Eco-Innovation into Business
<p>1. Summary of the impact</p> <p>Professor Martin Charter has directed The Centre for Sustainable Design ® at UCA since 1999. During this time he has developed a body of research concerning sustainable and eco-innovation, and sustainable and eco-design, with a particular focus on organisational implementation within business. This has led to a widespread programme of dissemination and application to SMEs through funded projects, publications, consultancy and training. The specific beneficiaries of this research are the SMEs through these projects, guidance and training.</p>
<p>2. Underpinning research</p> <p>The Centre for Sustainable Design (CfSD) was established in 1995 and focuses on issues of sustainable innovation and product sustainability. It was one of the first research centres in Europe to focus on the environmental, economic and social dimensions of sustainable design, and more specifically upon the environmental and economic aspects of eco-design. CfSD has worked to expand the understanding of eco-design as an integrative ‘design’ approach to design, development and manufacturing of products, services and technologies. CfSD has helped broaden conventional design thinking on sustainable design and eco-design to include the business perspective related to ‘managing eco-design’, including planning, as well as organisational implementation issues such as building cross-functional teams. Charter’s particular contribution to knowledge and understanding lies in the generally improved understanding of the business implications of eco-design and the exploration of the more holistic concepts of sustainable and eco-innovation. In 2002 and 2003, Charter led Department of Trade and Industry (DTI) fact-finding missions on the ‘state of the art’ of eco-design in the electronics sectors in Japan and subsequently in China, Hong Kong and Taiwan, resulting in respective reports. Alongside these activities, CfSD worked with national partners on further research into eco-design and dissemination activities in China, Thailand and India as part of the EC funded Asia Eco-Design Electronics (AEDE), which it led between 2005–2008.</p> <p>Sustainable Consumption and Production (SCP) and the Green Economy have emerged as key areas of European policy development since the millennium. CfSD’s research on Integrated Product Policy (IPP) in the late 1990s contributed to increasing understanding of the demand and supply policy toolbox and approaches to ‘greening’ the market. The IPP research was further taken into work on SCP and the role of business, innovation and design practice at a company level. CfSD research demonstrates that eco-design cannot simply be implemented in isolation at the level of product design, but requires organisational design considerations including the ‘buy in’ and involvement of, for example, supply chain management, procurement, logistics, manufacturing and marketing.</p> <p>As a result of learning from the above, CfSD has re-oriented its thinking on the concept of sustainable and eco-innovation with <i>design</i> being only one element of the process in taking ideas to the market. This research into the organisational dimensions of eco-design has run alongside Charter’s contextual work of chairing the development and launch of the ISO14006:2011 international standard, and delivering associated implementation training programmes worldwide.</p> <p><i>Sustainable Innovation 2013</i> is the 18th international conference organised by the CfSD since 1995. This series of conferences has brought together over 2000 delegates from 50 different countries, and the event has established a reputation for high quality discussion and networking of research and practice on sustainable and eco-innovation, and sustainable and eco-design. Delegates have come from research, business and policy-making communities, and post-conference evaluation demonstrates its formative role in the formation of new, often crossfunctional partnerships and project developments.</p> <p>CfSD has completed additional research, dissemination and industry engagement, particularly with UK SMEs, through a range of EC funded projects with other European partners including:</p>

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- SUSCIN: Sustainable Supply Chain through Innovation - £407K ERDF (2009–12)
- ECOMIND: Environmental Market and Innovation Development - €365K Interreg IV A North Seas (2008–11)
- FUSION: €362K Interreg IV A North Seas (2012–14).

Charter's research has led to his membership of two EC Joint Research Council led Foresight programmes exploring the Industrial Landscape Vision (ILV) for European manufacturing in 2025 and Eco-innovation/Eco-industries in 2035.

3. References to the research

- Charter, M., Clark, T., 'Product Sustainability: Organisational Considerations', *International Journal of Product Development*, Interscience Publishers, Vol. 6 No. 3–4, 2008, pp. 251–275 ISSN1477-9056 (REF2014)
- Tukker, A., Emmert, S., Charter, M., 'Fostering Change to Sustainable Consumption and Production: An Evidence Based Review', *Journal of Cleaner Production*, Vol. 16 Issue 11, July 2008, pp. 1218–1225, ISSN 0959-6526
- Tukker, A., Charter, M., Haag, E., Vercauteren, A., Wiedman, T., 'Eco-Design: The State of implementation in Europe – Conclusions of a State of the Art Study for IPTS', *Journal of Sustainable Product Design*, Springer, Vol. 1 Issue 3, 2001, pp. 147–161
- Charter, M., Tischner, U. (eds.), *Sustainable Solutions: Developing Products and Services for the Future*, Greenleaf Publishing, 2001, ISBN 978-1-874719-36-6
- *Eco-design: European State of the Art*, A European Science and Technology Observatory (ESTO) project report prepared by A. Tukker and P. Eder based on project contributions including M. Charter (2000)
- Charter, M., Clements, V., Cheng, I., Di Nardo, L., (ESF Report) *The European Social Fund: Sustainable Development and Eco-technologies* (2010) (REF2014)
- Charter, M., Gray, C., Clark, T., Woolman, T., 'Review: The Role of Business in Realising Sustainable Consumption and Production' in A. Tukker, M. Charter et al (eds.) *System Innovation for Sustainability 1: Perspectives on Radical Changes to Sustainable Consumption and Production*, Greenleaf Publishing, 2008 (REF2014)

4. Details of the impact

The details of impact are drawn primarily from two distinct yet related projects led by Charter. The first is the consolidation of his research and expertise through his convening of the ISO panel for Eco-Design, and subsequently his leadership of *Sustainable Supply Chains through Innovation*, a collaborative project funded by the Department of Communities and Local Government with the aim of transferring knowledge of eco-design and sustainability to SMEs.

International Organization for Standardization – ISO14009:2011 (Eco-design)

In 2008 Charter was elected to be the Convener of International Experts of ISO14006:2011 (eco-design) managing the process from initiation to publication of ISO 14006 (July 2011) [1]. This work builds on his role as the UK expert to ISOTR14062 (eco-design) between 1999–2001. His expertise was also incorporated within the aforementioned ILV 2025 Foresight programmes which also explored the role of standards. International Standards Organisation (ISO) is a network of national standards bodies that has 164 international member organisations, each of which has the option to publish ISO14006:2011. In the UK, ISO14006:2011 was incorporated by the British Standards Institution as *BS EN ISO14006:2011 Environmental Management Systems – Guidelines for incorporating Ecodesign (ISO14006:2011)* [2]. (Full details of ISO membership are available at http://www.iso.org/iso/home/about/iso_members.htm?membertype=membertype_MB).

The work of ISO14006 has been disseminated to the business community in a number of articles, features and activities including:

- Charter, M., Clements, V., 'ISO14006 – the new standard in design', *The Environmentalist*, Institute of Environmental Management Assessment, Sept. 2011, pp. 20–22
- Charter, M., Clements, V., 'ISO14006: eco-design within an EMS (environmental management system)', *Croner-i Environment and Sustainability*, Croner, Wouters Kluwer, Oct. 2011 <http://www.croner-i.croner.co.uk/croner-i/gateway.dll/ena-resources/ena-features/ena->

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[features-content/ena-gold-features-dcam-5375710?f=templates\\$fn=ena-frameset.htm\\$3.0](http://features-content/ena-gold-features-dcam-5375710?f=templates$fn=ena-frameset.htm$3.0)

- Oct. 2011, ISO14006 (Farnham), free workshop led by Charter and Clements: 10 SME delegates (82% rating); Dec. 2011, ISO14006 (Farnham), free workshop led by Charter and Clements: 5 SME delegates (75% rating)
- Responding to the growing business awareness of ISO 14006, two information videos were produced: Nov. 2011, ISO14006 video (English) uploaded to YouTube (1547 views as at 31.07.13); Feb. 2012, ISO14006 video (Mandarin captions) uploaded to YouTube (277 views as at 31.07.13)
- Webinar with IEMA led by Charter and Clements in Dec. 2011 provided guidance on the integration of eco-design into management systems and was attended by 90 online delegates
- M. Charter and V. Clements led a workshop on ISO14006 at the Institute of Environmental Management (IEMA) conference (UK, Nov. 2011)
<http://www.iema.net/conferences/iemaconference/2011>

Sustainable Supply Chains through Innovation (SUSCIN) [3]

Building on an established body of research concerned with the business and organisational aspect of eco-innovation, CfSD was commissioned by the Department of Communities & Local Government (DCLG) to lead Sustainable Supply Chains through Innovation (SUSCIN) working with project partners Action Sustainability (AS) and Remade South East (RSE).

The project, undertaken between January 2009 and June 2012, sought to build the sustainable business/eco-innovative capacity of SMEs in the South East; deliver sustainable procurement training to buyers in the South East; and to bring together buyers and SME suppliers of eco-innovative products, technologies and services in the South East. Match-funded by the European Regional Development Fund (ERDF), and the South East England Development Agency (SEEDA), the project had a total value of £407,677.88 and included programme design, delivery and evaluation. The SUSCIN project developed a series of innovative activities, workshops and events for disseminating and transferring research knowledge through active engagement of SMEs, procurement professionals and buyers in the South East. Working with specific businesses over a sustained period of time, these activities were bespoke and specific to the needs of SMEs while also offering training and development more broadly. Events included 'Meet the Buyer/Green Buyer' brokerage sessions, sustainable procurement training courses; 'Green Dragon' workshops; 'GreenThink' workshops; and 1:1 consultancy support. Specific sessions focused on the application of eco-design within environmental management systems (ISO 14006), Intellectual Property, and Green Marketing [3].

'GreenThink' is a customised process that aims to support individual companies in developing more sustainable solutions through existing and new products, services and product-services. GreenThink is a staged bespoke process beginning with an initial analysis of the SME's particular needs in relation to its existing and/or new product development and/or innovation processes. This is followed by a 'GreenThink' open ideas-generation session based on findings. The process addresses: 'state of the art' presentation on sustainable innovation and design; identification of income generating opportunities; highlighting of obstacles to market success; 'drill down' focus on specific opportunities; development of commercialisation plans; marketing and selling products; networking opportunities. The ideas are filtered, analysed and presented back to the SME in a succinct report produced within five to ten days of the final workshop. The report provides recommendations in relation to a) existing solutions, b) the development of new sustainable solutions, and/or c) other innovation/organisational challenges/opportunities that have been identified. The GreenThink process was conducted with 36 SMEs from Hampshire, Kent, East Sussex, Surrey, West Sussex, Berkshire and Oxfordshire, during which 247 delegates attended from 98 SMEs [3].

'Green Dragons' aimed to be a practical implementation of the Forward Commitment Procurement (FCP) initiative, which originally arose out of 'Procuring the Future', the 'Sustainable Procurement Task Force' report produced in 2006. It was designed as an innovative workshop and consultancy service, where a team of experienced consultants source and nurture an eco-innovative pipeline of products, technologies or services, focused on the construction sector. Eco-innovative suppliers

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were invited, following a selective evaluation process, to 'pitch' their sustainable goods and products to potential end users such as major construction commissioners and contractors. Drawing upon the specific knowledge and expertise of these firms' specifiers and buyers in their role as Green Dragons, the project worked to advise the suppliers on how better to shape and enhance their offerings to meet the needs of their supply chains [3].

The organisations that provided 'Dragons' included: HPW Architects Ltd, Balfour Beatty; Morgan Sindall, Skanska, Willmott Dixon, Capita Symonds, Network Rail, Procurement for Housing and Sainsbury's. Eco-innovative suppliers included Ambiental, the producer of flood risk software mapping systems used to predict and assess the impact of flooding events across the whole of the United Kingdom; Mantle® Building System© who produce a patented, tested and certified British system-build solution using 'super-insulated' composite materials to provide a structural solution; PaintPlus Colour Systems Ltd., whose Paint+ system for all substrates that is exceptionally durable and exceeds the stringent EU criteria for environmental compliance; and Zeta Group Solar powered lighting technology (Solar Powered Bus Shelter Lighting, Solar Powered Bus Stop Lighting, Solar Powered Amenity Lighting) [3].

195 semi-structured evaluation questionnaires were received from 566 participating SMEs. These demonstrate that SMEs benefited from improved understanding of the general application of sustainability to the development of new products, services and business strategy, and in particular support for the development of new business ideas, networking and collaboration, and buyer engagement (sources to corroborate impact [5,6,7,8,9]). Specific outcomes of SUSCIN include:

- 566 SMEs and a total of 1235 delegates attended training events and engaged in 1:1 consultancy
- 204 SMEs received 12+ hours of business assistance resulting in improved performance in 21 SMEs
- £2.3M reported new business won as direct consequence of participation in SUSCIN
- £0.99M reported net increase in gross value added (GVA)
- creation of 3.27FTE new jobs, and identification of a possible 139.35FTE new jobs across SMEs
- 17 businesses attributed increased turnover of over 5% to new and improved products
- 46 SMEs were enabled to tender for public sector supply chain contracts (£1.9M reported business won)
- network led to the creation of 53 new research and development links between SMEs

Building on action research and learning from SUSCIN, ECOMIND and FUSION projects, Charter was commissioned by the EU Eco-Innovation Observatory to co-author 'Eco-Innovate! A Guide to Eco-Innovation for SMEs and business coaches' [4] with Michal Miedzinski, Technopolis Group Belgium, and Meghan O'Brien, Wuppertal Institute (10,202 downloads at 31 July 2013):

http://www.eco-innovation.eu/index.php?option=com_content&view=article&id=636%3Anew-eco-innovation-sme-guide-published&catid=24%3Aannouncements&Itemid=1 and www.cfsd.org.uk/research

5. Sources to corroborate the impact

[1] ISO14006 *Environmental Management Systems – Guidelines for incorporating Ecodesign* International Organization for Standardization

[2] *BS EN ISO14006:2011 Environmental Management Systems – Guidelines for incorporating Ecodesign (ISO14006:2011)*

[3] Sustainable Supply Chains through Innovation (SUSCIN) Project Report and Evaluation (ERDF/SE/RD1/PR1/UCA)

[4] *Eco-Innovate! A Guide to Eco-Innovation for SMEs and business coaches*

[5] ERDF & RGF Contract Manager, South East Growth Delivery Team (DCLG).

[6] Managing Director, HPW Ltd.

[7] Environmental Development Manager, Hampshire Cosmetics Ltd,

[8] Managing Director, Carey Ambrose Ltd.

[9] Managing Director, Solar Co-op (formerly Maidenhead Transition Town) / Futurecurve.