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# Award-winning industrial design products: are they are also sustainable?

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**Abstract:** Every year, international design award giving bodies announce the winners of their design competitions, celebrating and promoting them to the public as exemplars of good design or design excellence. Winners are commended on the basis of innovation, form, function, quality, safety, and ecological sustainability. This latter criterion questions if there is real need for the product, if it reduces environmental impact, has a long lifetime, is resource efficient, complies with environmental best practice, considers end-of-life issues, designed for disassembly, and ethical. This paper investigates the approaches by which design award winners claim to respond to the sustainability criterion. The archives of the most popular awards in which most designers aim to be recognized in were consulted, and a content analysis was conducted against the conditions for sustainable product innovation. The study found that product design accolades do their job well in highlighting the excellent work of industrial designers and the manufacturers they work with. However, given the urgency of climate change and environmental disasters that are attributed to the impacts of not-so-responsible designs, it is sensible to rethink whether those in product development should continue pursuing the market oriented approach of offering consumers endless streams of award-winning material stuff to own. As the analyses show, designers and manufacturers are indeed capable of creating excellent solutions that are ecologically sustainable and socially responsible. While the proportion of such innovations is still low in comparison to the rest of the awarded products, it is promising to see growth in this area.

**Keywords:** industrial design, design awards, sustainable design, socially responsible design

## 1. Introduction

When people see a well-designed and useful object such as a smart phone, tablet computer, classic chair, ergonomic workstation, or hybrid car, they can usually grasp innovative minds were at work in creating this solution that answers their needs, but probably wouldn't realize that an industrial designer was instrumental in these intelligent creations. Industrial designers do work in many products that can be considered good design, delivering pleasure and convenience in the tools, furniture, packaging, vehicles and other products that we use in our daily lives.

Industry has established awards to recognize the efforts of design practitioners and manufacturers in offering the highly innovative products and outstanding solutions in the marketplace. These accolades stimulate the understanding of the business and public realms about the impact that excellent design could bring to the quality of human life everywhere and to the national and global economies. However, "good design", as recognized by international industrial design awards, has largely been about fresh looking novel objects that are driven by market consumerism and the latest technologies, with seemingly little regard for the impacts at the end-of-life of these products. Indeed designers are implicated in the mountains of short-lived products in landfill and other environmental problems arising from planned obsolescence [1] and the proliferation of unnecessary products and packaging [2].

Accolades for industrial design creations can be generally categorized generally into two types. One is an endorsement scheme for well designed products, whereby submitted entries are given commendations depending on how they conform to the assessment criteria and benchmarked with similar products in their particular category. In this mode the design award functions like a seal of design quality. The entrants do not compete with other products but instead demonstrate that they are exemplars of good design. Many products receive equal recognition, and there can be multiple winners at various levels. Commonly the designs entered in these endorsement schemes are required to be already in production and available for usage or purchase in the market. Most of the long-running mainstream industrial design awards are of this type.

The other type is based on an open contest where products vie for the honor of being named the best among the submitted products in meeting the competition brief. In this category only one product is adjudged the best and awarded the highest accolade, such as a gold prize. The second best gets the silver prize, the third best the bronze, and there can be a few honorable mentions or highly commended works too. In this award system, only one or a few products emerge as winners. It is common for designs entered into this award type to be at conceptual level and not actually available in the market.

Unfortunately many of the ground-breaking ideas entered in the competition-type design awards do not get realized into actual production, perhaps due to lack of financial viability, practicality or manufacturing resolution. Often as a concept progresses during the iterative process of new product development, several technical constraints are imposed along the way, causing the idea to reshape, sometimes significantly, in order to address the production and other requirements; the project could also ultimately be shelved if a feasible business model cannot be assured.

The criteria for evaluating products for design accolades vary, but in general the entries are assessed according to the product qualities and keywords in Figure 1. These adjudication criteria successfully

distinguish good design and design excellence in the marketplace from bad design and dull, unexciting products. The sixth criterion, "sustainability", has only been added in recent years by all major awards as a new prerequisite to entry, in apparent recognition of the need to minimize the overall lifecycle impacts of manufactured products on the environment.

**Figure 1.** Assessment criteria in mainstream industrial design awards.
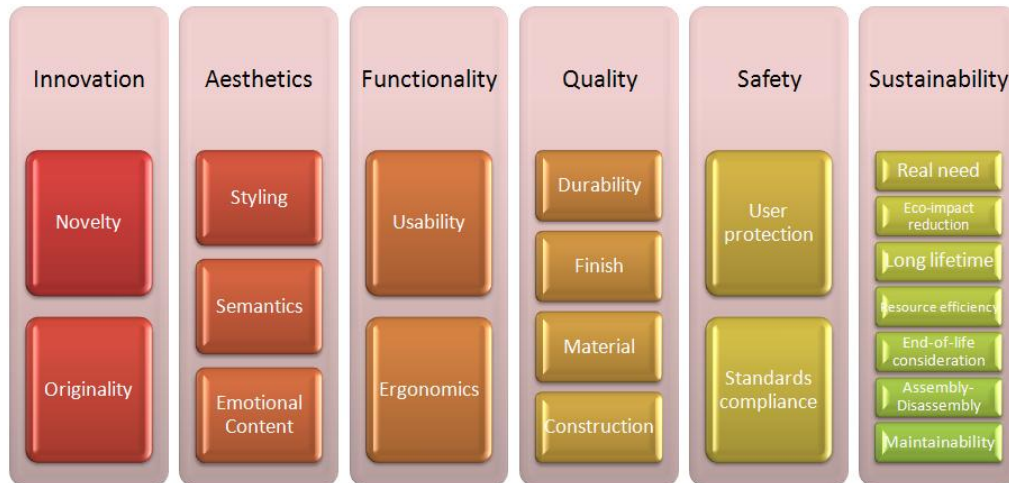


## 2. Sustainability in industrial design

It is widely accepted that sustainability, or more specifically sustainable development, consists of three pillars: ecological, social and economic [3]. Sustainable design can be said to be similar: it has to be ecologically benign, socially equitable and economically viable [4]. Since the early history of the industrial design profession, designers have rendered product creation services to manufacturers to help ensure their continued profitability, or "economic sustainability". At this time when the planet and its peoples are suffering from the global effects of climate change, which are claimed to be linked to the unintended consequences of manmade solutions, we need to strongly consider how design could become more environmentally sensitive and socially responsible.

### 3.1. Ecologically sustainable product innovation

In 1971 the activist design professor Victor Papanek accused industrial design as being one of the most harmful of professions; he asserted that "by creating whole new species of permanent garbage to clutter up the landscape, and by choosing materials and processes that pollute the air we breathe, designers have become a dangerous breed" [5].

In later decades "green design", "ecodesign" or "design for environment" became the answer of the industrial designers and manufacturers to this call for accountability on the global environmental crisis stemming from conventional market-driven design and mass production. Through clever solutions informed by impact assessment, ecologically sustainable design minimizes environmental harm while maintaining quality of life. Strategies and tools outlined in ecodesign manuals and checklists [6, 7] are often used to understand or measure impacts of products at various phases of their lifecycle. These strategies include prescribing materials with lower environmental impacts (non-toxic, low embodied energy, renewable, recycled or recyclable, etc); designing for recycling or reuse; efficient usage of

energy, water or other materials; transport volume minimization; consideration of disassembly, maintenance and recyclability; optimizing product lifetime; cleaner production; and so on.

### 3.2. Socially sustainable product innovation

Papanek argued that "much recent design has satisfied only evanescent wants and desires, while the genuine needs of man have often been neglected by the designer" [5]. He advocated that market-oriented designers go beyond "appearance design, styling, or design cosmetics", and use their talents instead to address the needs of the disadvantaged minorities in society and others often ignored by the design profession. His pleas for good design that solves problems in the real world contributed to the emergence of "socially responsible design", defined as "the use of design to address social, environmental, economic and political issues" [8]. This ideology campaigns for all humans to acknowledge their moral obligation to act for the betterment of society and life in general. A proposed model for socially responsible design, based on the management approach of corporate social responsibility, identifies crime, education, government, health, fair trade, ecology, social inclusion and economic policy as the eight socially significant domains to which designers can direct their creative problem solving skills [8].

Many recent design movements and philosophies can be linked to socially responsible design. There is "socially responsive design", which "takes as its primary driver social issues, its main consideration social impact and its main objective social change" [9]. Analogous to this is "humanitarian design", which upholds the universal and egalitarian rights and dignity of every human being through appropriate solutions. These include such approaches as "design for the bottom of the pyramid" [10], "design for the millennium development goals" [11], "design for the other 90%" [12], "design for the majority" [13], and "design for development" [14]. "Ethical design" is grounded in principles that are popularly accepted in society as morally right values. Another relevant but ambiguous principle is "democratic design", which suggests that good design should not be reserved for the affluent few but rather made accessible to everybody; it could also refer to participatory design in which stakeholders are actively involved in identifying problems and in co-creating the right answers to their needs. Universal or inclusive design represents another ethos, promoting non-discriminatory products that are inherently usable by as many people as possible, whether able-bodied or physically challenged. All these movements allude to an emerging stream of "design activism" among people who passionately want to "use the power of design for the greater good of humankind and nature" [15].

## 3. Methodology

This paper investigates the accommodation of ecological and social sustainability within international industrial design awards. Design awards and competitions are viewed here as public arenas where practitioners display their best abilities in offering meritorious solutions to a range of design issues, and where organizers demand the most notable outcomes in the industry through the evaluation criteria that they establish.

The research was firstly narrowed down to the most popular awards (Table 1) which designers aim to be recognized in. The archives of these awards were consulted, and a content analysis was conducted on evidences of sustainable product innovation. After tabulating the number of awards

given out yearly, it became evident that the study will entail analysis of an exceedingly huge number of winning designs, even when student entries and conceptual proposals have been excluded (Table 2).

Due to time constraints, the study was further limited to the last four years of three mainstream awards: the Australian International Design Awards (AIDA), the International Design Excellence Awards (IDEA) based in the USA, and the International Forum Product Design Award (iF-pd) based in Germany. The G-Mark of Japan and the Red Dot Award of Germany had the most number of awardees; the analyses of these will be incorporated in a future publication. The Chicago Athenaeum Good Design Awards, while being the world's first accolade for industrial design, was excluded because the archives do not provide any explanatory text to describe the winning products. Contrastingly the other five awards provide rather detailed descriptive information about the winners, allowing deeper understanding of the design; IDEA, G-Mark and Red Dot even supply the jurors' rationales for awarding the most outstanding products.

**Table 1.** Mainstream industrial design awards in the study.

| Award | Accolades | First awarded | Web site | Operator |
|---|---|---|---|---|
| Good Design \| Product Design, USA | Good Design | 1950 | www.chi-athenaeum.org | Chicago Athenaeum Museum of Architecture and Design |
| iF \| Product Design Award, Germany | iF Award | 1953 | www.ifdesign.de | International Forum Design GmbH |
| Red Dot Award \| Product Design, Germany | Red Dot, Honorable Mention | 1955 | www.en.red-dot.org | Design Zentrum Nordrhein Westfalen |
| G-Mark: Good Design Mark, Japan | Good Design Award | 1957 | www.g-mark.org | Japan Industrial Design Promotion Organization |
| AIDA: Australian International Design Awards | Design Award, Good Design | 1958 | www.designawards.com.au | Good Design Australia |
| IDEA: International Design Excellence Awards , USA | Gold, Silver, Bronze | 1980 | www.idsa.org | Industrial Designers Society of America |

**Table 2.** Number of accolades awarded per year, excluding student and concept categories.

| Award | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| AIDA | 42 | 61 | 73 | 111 |
| G-Mark | 1043 | 1067 | 1034 | 1110 |
| Good D | 400+ | 433 | 587 | 494 |
| IDEA | 49 | 157 | 118 | 152 |
| iF-pd | 742 | 811 | 785 | 756 |
| RedDot-pd | 666 | 863 | 926 | 1073 |

# 4. Results

Graphing the results of the analysis of the three award schemes selected for the study (Figure 2), it can be seen that the socially sustainable product innovations can be categorized into product groupings, discussed in the subsections that follow.

## 4.1. Designs for saving lives and fostering good health

Consistently outnumbering all other winning designs in the three schemes are products which are categorized as "medical", "scientific" and "health care". Clearly these products are directly involved in saving lives and promoting good health, safety and wellbeing that would enable people to participate and contribute to society. Most of these were items for in-hospital patient care, and many were also for home use. These include

- In-hospital bedside care: universal trolley stretchers, vital signs monitors, intravenous containers, electric beds, neonatal incubators, infusion workstations, respiratory ventilators, bedpans, catheter handsets.
- Emergency rooms: knee bandages and braces, ultrasonic nebulizers, asthmatic inhalators, pressure garments, hypothermia cooling kits, obstetric forceps, orthopedic braces, spinal immobilization backboards, cold compression therapy.
- Clinical diagnostics: portable ultrasound tools, breast volume scanners, ECG, MRI, lung function screeners, melanoma detectors, sleep study, prostate exam chairs; analyzers for blood chemistry, cancer and infections in tissue samples, cell metabolism.
- Surgery: operating tables, instruments for surgery and laparoscopy, workstations for organ recovery and transplantation, touch-free faucets, surgical lights.
- Domestic use: forehead thermometers, blood pressure monitors, blood glucose testers, breast pumps, asthma puffers, infrared heaters, sleep apnea masks, hearing aids, eating aids, wheelchairs, prefilled syringes, body fat scales, walking frames, HGH injectors.

The majority of these award winning medical products are not necessarily groundbreaking; indeed they are mostly incremental innovations in a mature market. Interestingly, some of the rather radical innovations come from Royal Philips Electronics:

- Philips Lifeline PERS (personal emergency response service), a cordless phone system with a wearable medical alert button and back-to-base station for immediate assistance and emergency coordination, to enable frail elderly people with independent living at home.
- Philips' interactive toy CAT (computerized axial tomography) scanner, also known as "kitten scanner", designed to help lessen children's anxiety about the scanning procedure by using role play and storytelling to learn what to expect.
- Philips Breath Counter, a solar-powered respiration-monitoring device to enable health-care workers in developing countries to detect pneumonia and accurately and reliably identify and classify cases of the disease in just 60 seconds.

Relevant to this category also are products used to save lives and improve human living conditions during disasters and emergencies. These include rapidly deployable shelters (RDS), rapid deployment flood walls (RDFW), firefighting devices, fire sprinklers, vehicle crash extrication tools, and winches.

**Figure 2.** Breakdown of socially sustainable product innovation by categories in design awards.
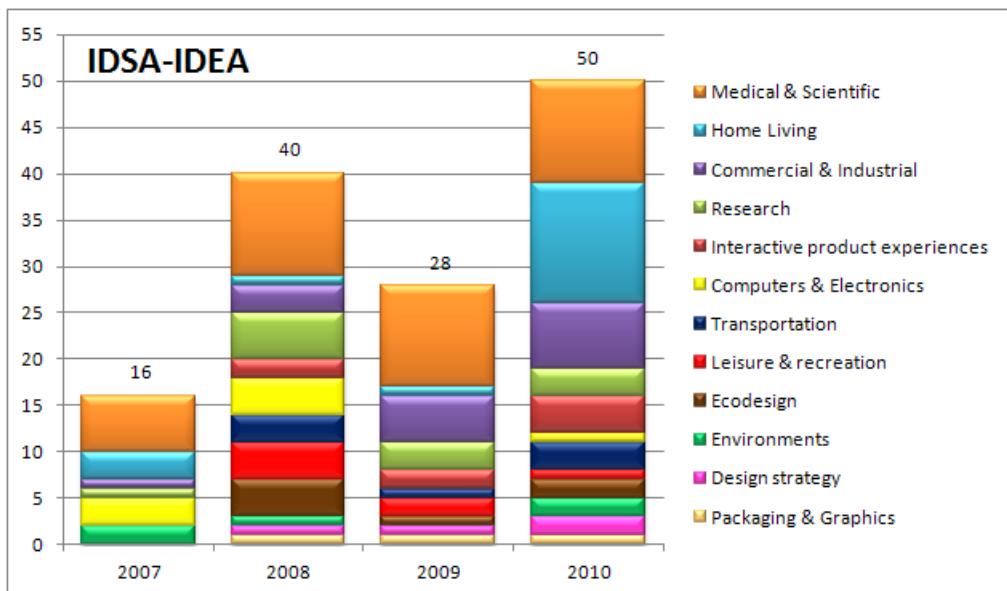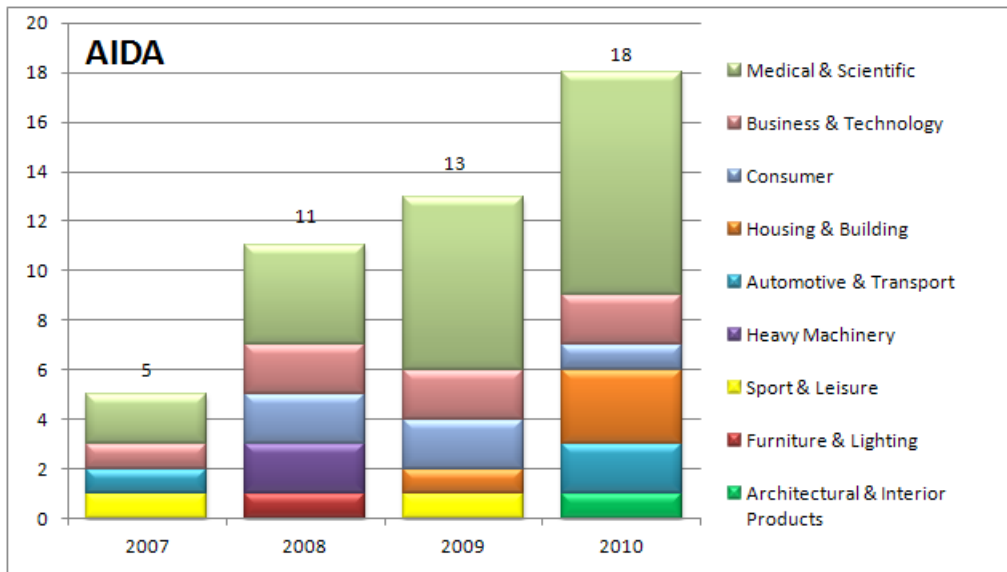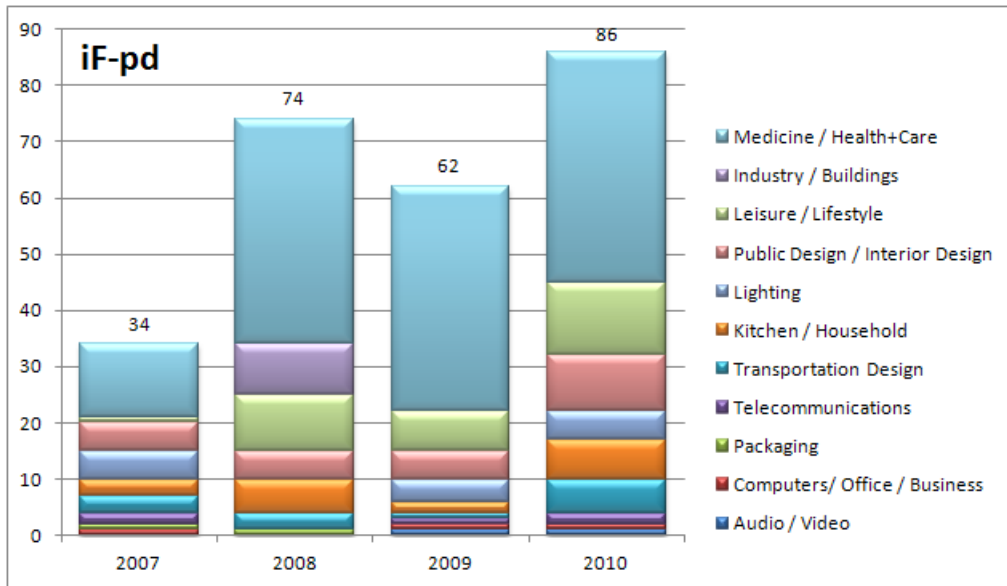
*4.2. Designs for low-impact recreation and lifestyles*

Products that enable participation in behavior-changing recreational activities constitute the second largest number of socially sustainable product innovations, although only 1/3 the number of medical and scientific products.

- Products which enable and enhance participation in sustainable mobility and commuting. These include folding bicycles, city bikes, road bikes, electric bikes, as well as cycling accessories such as safety lights, handlebar grips, tire levers, helmets, pannier bags, water flasks, security locks, and parking stands.
- Products which afford safe and pleasurable participation in healthy outdoor activities. These include life jackets, rechargeable flashlights, backpacks, amphibious lanterns, head lamps, snow shovels, educational tennis gloves, portable solar panels, hedge shears, watering cans.
- Products which promote sustainable procurement. These include personal shopping trolleys, handy grip for plastic bags, reusable shopping bags.

Again most of these were incremental innovations. Some of the far-reaching recreational and lifestyle product innovations include:

- Kiddie's Paradise Wavy Tactile Path, an educational sensory and tactile toy inspired by trails in a rice field, helping children to improve their coordination, balance and ability to adapt to different environments.
- Yakkay bicycle helmet with hat covers, where safety and style are united and equally valued, encouraging the design conscious to consider commuting by bike.
- Stelton Shopper, a reusable nylon shopping bag with designer graphic prints; while not in use, it folds and hides away into its own plastic handle.

*4.3. Designs for pleasurable public and work spaces*

The third largest group is comprised by products categorized in the various awards as "public design", "environments", "architectural and "interior products", "commercial and industrial products".

- Products which promote enjoyment of public outdoor spaces. These include modular street and park furniture systems, information kiosks, litter bins, self-cleaning city toilets, smokers lobby, recycling kiosks.
- Products which enhance sustainable transportation. These include modular public transport shelters, smartcard load rechargers, ticket validators, e-ticketing terminals, and electric car fast charging points.
- Products which enhance safe working environments and conditions. These include construction safety harnesses, vibration control gloves, Optalert™ eyewear for managing driver fatigue and drowsiness.

More revolutionary innovations in this category include:

- Wall AG Dog Service Station encourages dog owners to clean up after their dogs; system includes waste bag dispenser and pedal-operated odorless disposal unit.
- NYC Condom Dispenser, an initiative of the New York City Department of Health which offers free condoms in public places as an effective measure against HIV infections and unwanted pregnancies.

- Better Place Charge Spot provides fast-charging power outlets for electric vehicles in public places.
- Mobility Vision Integration Process, deck of creativity cards and online brainstorming tool to investigate how expert designers can support and accelerate dialogue about the future of sustainable mobility.

*4.4. Designs for healthy everyday living*

This group incorporates those in the "consumer products", "household", "residential", "home living", "kitchen" and "personal" categories in the three awards.

- Products which provide a healthy and safe living environment. These include: allergy-free vacuum cleaners, air ionizers, water purifiers, child safety gates, modular planters and hydroponics for apartment kitchen gardening.
- Products which prevent wasteful consumption. These include battery chargers, water saving shower heads, trash compactors, non-electric ice pop maker, reusable shipping containers, air multiplier fans, and kitchen sink water reuse bucket.
- Products which follow universal design principles. These include the One Touch™ can opener, easy-to-use corkscrews, kitchen aids, padlocks, scissors.

The more disruptive innovations in this category are

- Makedo, a reusable connector system that enables construction and creation with found materials.
- Stacket, a space-efficient square bucket for places where storing rationed water is the norm.
- Easy Latrine, an affordable household sanitation solution for developing countries. This simple design was awarded the IDEA Best in Show in 2010.
- Philips Chulha, a low-smoke biomass stove designed for households in rural India. Reducing indoor air pollution that causes fatal respiratory diseases, this project is a demonstration of Philips' "Philanthropy by Design" approach.
- IDEO Human-Centered Design Toolkit, a free innovation guide that empowers NGOs and social enterprises in the developing world to address needs of those living on less than $2 a day.

*4.4 Ecologically sustainable product innovations*

Because ecological sustainability has become a required entry criterion for all three awards schemes, it can be reasonably assumed that winners have all successfully passed this requirement.

In 2007 AIDA instituted a special Award for Excellence in Sustainable Design (now called the AIDA Design Award | Sustainability) which is awarded to the single most environmentally conscious design of the year. In 2008 the G-Mark Long Life Design Award was established to honor the many products which have been in production and distribution for 10 years or more; at the same time the G-Mark Sustainable Design Award was formed to recognize the many products which are expected to make a contribution to lasting values in the near future. In 2009 The Chicago Athenaeum started the Green Good Design Awards to complement the Good Design Award; 24 recipients were recognized in 2009 and 64 in 2011.

From 2006 to 2010 the IDEA ran a dedicated Ecodesign category; this is now defunct. A related scheme is the IDEA Designs of the Decade, which ran in 2000 and 2010 (and presumably in 2020,

2030 and beyond), and whose subcategories included: solutions to a developed world social problem, developing world social problem, most responsible design solution, best sustainable design solution, and others. Similarly Industrie Forum used to run a special iF Ecology Design Award scheme from 1997 to 2001, but this award has now been largely integrated into the regular iF Product Design Award, which has added "environmental impact" as one of the standard evaluation criteria.

This study found the following examples of ecologically sustainable product innovations:

- Products made from pre-consumer waste: basketball shoe from leftover leather, foam and rubber.
- Products which promote resource-efficiency: LED task light; dimmable LED lighting retrofit down lights; clean-burning single-pot biomass cook stove cuts fuel emission by as much as half while burning hotter and reducing toxic emissions by up to 80%.
- Products against disposable culture: washable mesh shopping bag for fruits; packaging of energy-saving light bulb becomes lamp shade; reusable shipping container vs cardboard boxes; business cards recycled from long-life carton board.
- Products with less toxic materials and emissions: task chair with no glues and with 33% recycled content; laser engraved dry leaf as invitations; Tesla Roadster electric-powered sports car; PACT organic cotton underwear shipped in reusable fabric bags and compostable shipping pack, each piece sold donates to a nonprofit organization; Mion high-performance amphibious footwear made of relatively inert EVA material, contains the first ever Eco Metrics label to provide consumers with details on the impact of their purchase.

## 5. Discussion & Conclusions

The inclusion of sustainability criteria in mainstream industrial design awards is certainly commendable. Through this we hope that products which have no consideration of their environmental impacts or real benefits to society are excluded from being acclaimed as product exemplars of good design. At the same time this would hopefully encourage the development of more sustainable product solutions to the point that it becomes the norm for all new products in the market to be truly ecologically sensitive and socially responsive.

**Figure 3.** Proportion of socially sustainable product innovations (SSPI).
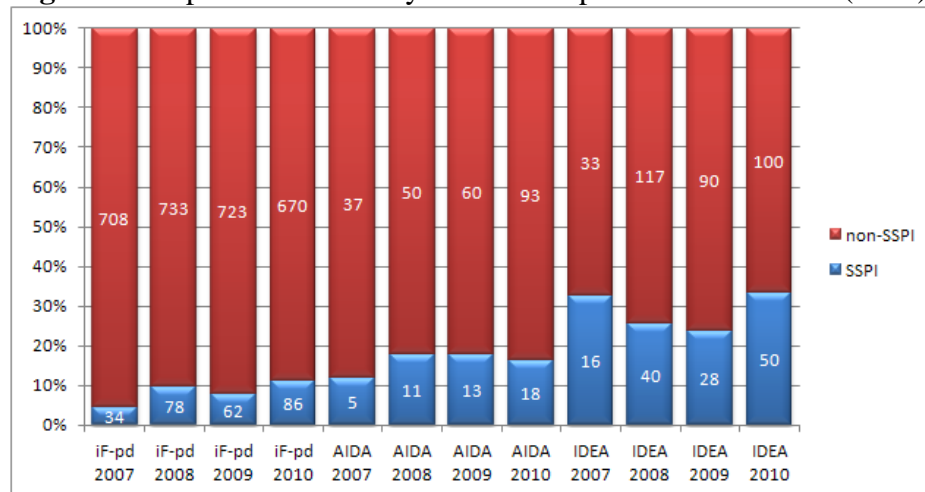
While it may appear in Figure 3 that the iF product design awards has more socially sustainable product innovations than the other schemes, it can be seen that, relative to the number of accolades handed out, the socially sustainable fraction of iF-pd is in fact the smallest among the three. The four-year average on the proportion of socially sustainable designs for iF-pd is only 8.4%; in comparison AIDA has 16% while IDEA has a 29% mean.

This study also found that the financial cost to participate in these design awards can be very high. The lowest charge was US$ 390, for entry into the Chicago Athenaeum Good Design Award (see Table 3). The Best of the Best winners in the Red Dot shell out at least US$ 6,808, which includes use of the Red Dot label, a double page on the yearbook and design diary, and a one-year exhibition in the Red Dot museum for small objects such as mobile phones; large appliances, vehicles and furniture systems have to pay up to US$ 10,140.

**Table 3.** Participation costs in mainstream industrial design awards.

| Award | Charge | Cost | Cost US$ |
|---|---|---|---|
| AIDA | Assessment for standard object | A$ 990~ A$2200 | $1089~ $2420 |
| GMark | 1st screening | ¥ 10,000 | $130 |
| | 2nd screening | ¥ 50,000 | $649 |
| | Yearbook | ¥ 30,000 | $390 |
| | Expo exhibit | ¥ 20,000 | $260 |
| Good Design | Entry | US$ 350 | $350 |
| IDEA | 1st round | US$ 350 | $350 |
| | 2nd round | US$ 250 | $250 |
| iF | Registration | € 340~450 | $488 ~ $646 |
| | Winner | € 2600 | $3734 |
| Red Dot | Registration | € 200~240 | $287 ~ $345 |
| | Excess size | € 50~150 | $72 ~ $216 |
| | Winner & honorable mention | €2250~4250 | $3232~$6104 |
| | Best of the best | €4740~7060 | $6808~$10140 |

Some of the mainstream design awards have categories which invite concepts, explorations or projects still at proposal stage. Some of these conceptual winners show promise in addressing social sustainability issues, but because this paper is only interested in realized solutions, these unrealized entries were excluded from the analysis.

Relevant to this study, competitions specifically celebrating socially responsible design were also found. The INDEX: Award "Design to Improve Life" in Denmark is the most prestigious, rewarding its five winners with €100,000 each. The Saatchi & Saatchi Award for World Changing Ideas gives $50,000 cash plus $50,000 marketing consultancy to one winner. Other schemes include the ICSID World Design Impact Prize, the Victor J Papanek Social Design Award "Design for the Real World Redux", the Spark Design & Architecture Awards, and the Core 77 Design Awards which has a "Design for Social Impact" category. Some of these require that the entries must have been realized in production while some are open to conceptual proposals. On the ecodesign front, one of the most

recent prizes is the German Federal Ecodesign Award, or Bundespreis Ecodesign, running for the first time in 2012, with a cash prize of €1,000.

Product design accolades do their job well in highlighting the excellent work of industrial designers and the manufacturers they work with. However, given the urgency of climate change and environmental disasters that are attributed to the impacts of not-so-responsible designs, it is sensible to rethink whether designers and manufacturers should continue pursuing the market-oriented approach of offering consumers endless streams of award-winning material "stuff" to own.

As the analyses show, designers and manufacturers are indeed capable of designing excellent solutions that are socially sustainable. While the proportion of such innovations is still low in comparison to the rest of the awards, it is promising to see growth in this area. BusinessWeek noted that in 2008 a "strong sense of social responsibility ran through most of the winning entries" [16], and that this trend was repeated in 2009 [17].

That mainstream design accolade schemes are so costly to enter might be one reason why we see relatively few of the truly transformative socially sustainable product innovations entering and winning. Indeed the financial investment in participating could be better spent on supporting the product to reach more intended beneficiaries in society. Social designs do not necessarily gain the commercial advantage that traditional industrial design objects get from winning these mainstream awards. It is more practical for them to gain recognition through the special design competitions on social impact, which are either free or low-cost to enter and also could offer huge monetary prizes for winners. The other reason, of course, for lack of social design presence in the awards is that the humanitarian innovations are not seen to have enough visual appeal to be worthy of such design awards.

The successful examples of sustainable product innovations in this paper prove the stimulating and empowering agency that industrial design has in helping usher a world that is more equitable and beneficial for more people and the planet. As evidenced by the charts, more designers and manufacturers are increasingly embarking on endeavors that advance the betterment of humanity and posterity; this is commendable, and we hope to see this trend continue in the future. Sustainability is a relatively new ballgame for designers [18], and the attempts of the design industry worldwide to engage in this challenge should be supported and encouraged, particularly in strengthening its capacity to contribute towards a truly sustainable future.

**References and Notes**

[1]    V. Packard, *The waste makers*. New York: McKay, 1960.
[2]    A. Leonard, *The story of stuff*. New York: Free Press, 2010.
[3]    UN, *Resolution A/60/1: 2005 World Summit outcome*. New York: United Nations General Assembly, 2005.
[4]    P. White, S. Belletire, and L. St Pierre, *Okala ecological design: course guide*. Portland: Industrial Designers Society of America, 2004.
[5]    V. J. Papanek, *Design for the real world: human ecology and social change*. London: Thames & Hudson, 1971.
[6]    J. C. Brezet and C. G. Van Hemel, *Ecodesign: a promising approach to sustainable production and consumption*. Paris: United Nations Environment Programme, 1997.
[7]    H. Lewis, J. Gertsakis, T. Grant, N. Morelli, and A. Sweatman, *Design + environment: a global guide to designing greener goods*. Sheffield: Greenleaf, 2001.

[8]     C. L. Davey, A. B. Wootton, A. Thomas, R. D. Cooper, and M. Press, "Design for the surreal world? A new model of socially responsible design," presented at the EAD06 Sixth European Academy of Design Conference, Bremen, 2005.

[9]     L. Gamman and A. Thorpe, "Design Against Crime as socially responsive theory and practice," presented at the DESIGN2006: 9th International Design Conference, Dubrovnik, 2006.

[10]    C. K. Prahalad, *The fortune at the bottom of the pyramid: eradicating poverty through profits*. Upper Saddle River: Wharton School of Business, 2005.

[11]    M. J. R. Ramirez, "Making poverty history: alerting industrial design students to the Millennium Development Goals," presented at the ConnectED2010 International Conference on Design Education, Sydney, 2010.

[12]    C. E. Smith, *Design for the other 90%*. New York: Cooper-Hewitt National Design Museum | Smithsonian Institution, 2007.

[13]    L. E. Speer, "Paradigm shift: the next decade in design," *Innovation,* pp. 31-35, 2006.

[14]    I. Oosterlaken, "Design for development: a capability approach," *Design Issues,* vol. 25, pp. 91-102, 2009.

[15]    A. Fuad-Luke, *Design activism: beautiful strangeness for a sustainable world*. Sterling: Earthscan, 2009.

[16]    B. Nussbaum. (2008, Jul 17) IDEA design trend: social responsibility. *BusinessWeek*. Available: http://www.businessweek.com/print/magazine/content/08_30/b4093048756557.htm

[17]    H. Walters. (2009, Jul 29) IDEA 2009: Designing a better world. *BusinessWeek*.

[18]    S. J. Clune and M. J. R. Ramirez, "Sustainability consideration in the Australian International Design Awards," presented at the Sustainability in Design Now! International Conference of the LeNS Learning Network on Sustainability, Bangalore, 2010.

**Conflict of Interest**

The author declares no conflict of interest.