

A REVIEW ON GREEN PURCHASE BEHAVIOUR AND CONSUMER RESISTANCE TO GREEN PRODUCT INNOVATION

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ABSTRACT

Green marketing has become ubiquitous. Generating profits through green marketing, however, has not. While firms continue to adopt environmental practices, they struggle to gain a competitive advantage through these endeavors. While scholars search for underlying theories and motivational factors to explain and change this behavior, managers simply want tangible solutions that improve performance and provide a return on their green investments. Environmental orientation may shed light onto this discrepancy by assessing a firm's ability to provide an authentic, unified image of environmental commitment.

Keywords: Green consumer behavior, green product, Green marketing

INTRODUCTION

Politicians and scientists have widely accepted the notion that our production and consumption activities exceed ecological limits (UN 2005a; UN 2005d). The available scientific evidence suggests that human impact on the environment has reached levels that impose serious constraints on our future ability to meet our basic needs (UN 2005d; UN 2006). Issues like resource depletion, loss of biodiversity and the risks posed by accelerating climate change have become of paramount concern (Stern 2007). While the human population is growing exponentially and with it the demand for goods and services, we concurrently experience a systematic accumulation of pollutants and waste in the world's biosphere, accompanied by a steady decline of natural resources, mainly resulting from the negative externalities of our economic activities (WWF 1998).

However, human dependence on carbon-based energy sources is arguably the single biggest challenge. Over-reliance on carbon-based technologies and the burning of fossil fuels have led to an accumulation of greenhouse gases in the earth's atmosphere at a rate that is changing the climate. Over the past century the level of greenhouse gases (including carbon dioxide, methane, nitrous oxides and a number of gases that arise from industrial processes) in the atmosphere rose from about 280 parts per million (ppm) CO₂ to 430 ppm (Stern 2007). The scientific consensus confirms that as a result, incoming energy from the sun is trapped, which is causing the average global temperatures to rise, leading to potentially cataclysmic changes in our climate. Scientists, politicians and marketers alike have come to realise that existing energy systems are unsustainable and that progress towards sustainability requires significant changes in the production and consumption of energy (e.g. OECD 2000). Household energy consumption is of particular interest as it provides one of the greatest potentials to reduce overall energy demand and greenhouse gas emissions. For example, in the United States households account for 27% of total primary energy requirements and for about 41% of energy-related CO₂ emissions (Bin and Dowlatabadi 2005). In Ireland, where this research was conducted, households account for about 25% of total energy consumption and 26% of CO₂ emissions (O'Leary et al. 2008).

Recent technological innovations have made it possible for home owners to retrofit their homes and to generate their own electricity and heat by the use of *microgeneration technologies* such as photovoltaic (PV) panels, micro wind turbines, solar water heaters, wood pellet boilers, geothermal heat pumps or combined heat and

power units (CHP).¹ Previous studies have shown that investment in microgeneration can be an economically viable way to reduce energy costs and CO₂ emissions and can help to trigger positive changes in energy consumption patterns (Allen et al. 2008). Hence, microgeneration has the potential to play an important part in reducing overall energy demand and CO₂ emission and to contribute towards more sustainable systems of energy production and consumption.

But despite consumer sensitisation towards sustainability issues, microgeneration faces slow rates of diffusion in mainstream markets as consumers' green preferences regularly fail to translate into adoption behavior (Prothero et al 2011).

As a result, in many countries microgeneration technologies have been languishing for years in the chasm between early adopter and mainstream markets and are often dependent on policy support in the form of subsidies or tax incentive (Sijm 2002). Microgeneration thus shares a similar fate with green innovations like hybrid or electric vehicles, green detergents or organic foods, which all failed to develop significant shares in consumer markets (Boini and Oppenheimer 2008).

In this context, consumer response has been identified as a key challenge that companies are facing when developing and marketing sustainable new products like microgeneration (Dangelico and Pujari 2010). However, little is known about the factors that cause the mismatch between consumers' reported positive attitudes and their actual unwillingness to purchase, thus providing a clear mandate for further research in this area (Prothero et al. 2011).

Blake (1999) for example argues that the gap between values or attitudes and behaviours is 'clogged up' with barriers, which prevent consumers from enacting pro-environmental behaviours. For example, consumers might simply be unaware of the environmental benefits, whereas others might not be willing to pay a premium for environmentally superior alternatives. Further, green attributes are often in direct competition with more traditional product characteristics such as performance or design (e.g. Berchicci and Bodewes 2005; Dangelico and Pujari 2010; Ottman et al. 2006). Other green innovation might face resistance as it requires consumers to change their daily habits and routines or to break with entrenched traditions and norms (Kleijnen et al. 2009).

Understanding consumers' perception of green products and, more importantly, barriers consumers associate with adoption is therefore of critical importance for companies aiming to improve new product development processes and marketing strategies in order to overcome resistance in consumer markets (Antioco and Kleijnen 2010, p.1701). Identifying factors that constrain consumers' ability and willingness to adopt green products is also vital for public policy as it holds important implications for the adjustment of market structures, provision of incentives, and implementation of regulations (Press and Arnould 2009, p.102)

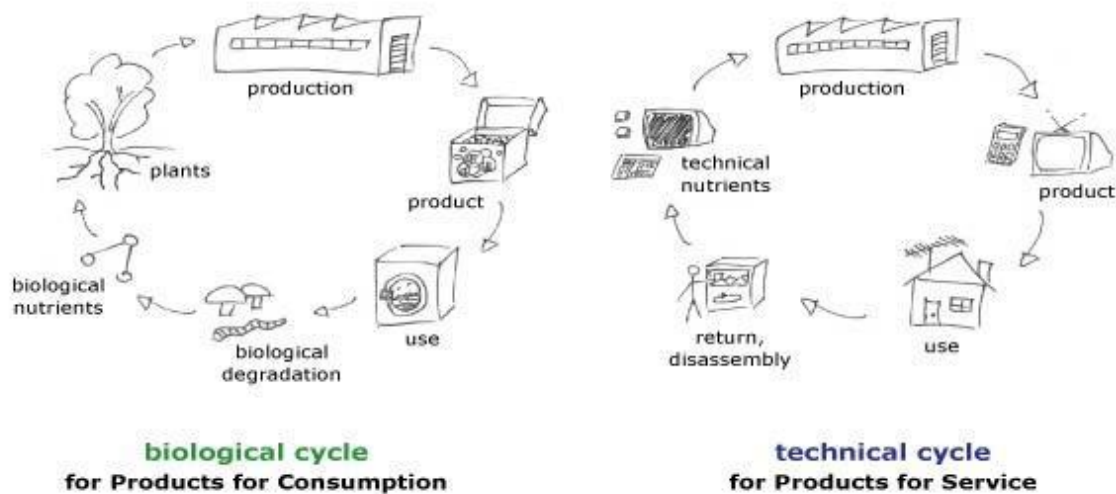
LITERATURE REVIEW

Defining "green"

Before providing an operational definition of what *green* or *sustainable* product innovation means in the scope of this paper, we briefly introduce a more holistic concept of green products, which provides a useful or benchmark for the more operational definition. Michael Braungart, the founder of the Environmental Protection Encouragement Agency (EPEA), and his colleagues developed the vision of an "Intelligent Product System" (IPS) (e.g. Braungart et al. 1990; Braungart and Engelfried 1992) The IPS aims to minimise the negative consequences of production and consumption activities by transforming our current linear systems (i.e., cradle to grave products) into circular systems (i.e., cradle to cradle products). In IPS all materials are either fed back into the —natural cycle (i.e., biological nutrients such as biodegradable products) or into the —technical cycle (i.e., technical nutrients such as metals or polymers). The IPS therefore allows for only three types of product.

Figure 1: The nutrient cycle

¹ CHP is technically not a —renewable but is included here as it has the potential to save significant amounts of energy and reduce carbon emissions.



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Source: EPEA 2010

The first category comprises products that can be literally consumed or are made of materials that are 100% biodegradable and can thus be fed back into the natural cycle.

The second group is durables, made from technical nutrients, which, after they provide a service to the user, get recycled and fed back into the technical cycle. These products always remain the responsibility of the maker and can therefore only be rented or licensed to consumers. The third category consists of unmarketable products that are made from toxic materials that should not be sold at all. Unmarketable products cannot be consumed in a sustainable way and thus need to be replaced completely. Within IPS entirely green products are thus made of substances that are either 100% biodegradable or completely recyclable and contain no toxins or other harmful substances. However, Braungart acknowledges that there are shades of grey and that certain substances in manufacturing processes cannot be substituted yet, implying that "greening" of products is a continuous process, often driven by innovation.

In this study we therefore build on a less rigid explanation of green products provided by Ottman et al. (2006, p. 24), who state that:

"although no consumer product has a zero impact on the environment [as yet], in business the terms *green product* or *environmental product* are used to describe those that strive to protect or enhance the natural environment by conserving energy and/or resources and reducing or eliminating use of toxic agents, pollution and waste".

The definition highlights two important points. First, it emphasizes that companies develop products that strive to be more environmentally friendly, implying that the "greening" of products is an *iterative* process driven by innovation. Second, Ottman et al. highlight three areas for environmental improvement, including materials/recourses, energy and pollution/toxic waste. Thus, green products should help to reduce the

- concentrations of substances extracted from the Earth's crust;
- concentrations of substances produced by society;
- degradation by physical means; and
- thus not undermine societies' capacity to meet their needs.

It is also important to note that the greening of products via innovation can occur at various stages of a product's physical lifecycle, i.e., at the extraction, manufacturing, distribution, usage, and disposal stages (e.g. Belz and Peattie 2009; Dangelico and Pontrandolfo 2010; Dangelico and Pujari 2010). Building on the typology of product innovation provided above, we thus add two dimensions in order to classify green product innovation. First, we specify the type of environmental improvement an innovation provides (i.e. a reduction in materials, energy or pollution) and, second, we specify the stage(s) in the physical lifecycle at which the improvement(s) occurs.

Table 1: Green product innovation typology

Level of Innovativeness	Stage in Product's Physical Lifecycle	Type of Environmental Improvement
Incremental	Extraction	Materials/Recourses
Really New	Production	Energy
Radical	Distribution	Pollution/Toxic waste
	Usage	Behavioural Change
	Disposal	

Building on the above discussion we propose the following definition: "Green product innovation is an iterative process, initiated by the opportunity for environmental improvement of the product's physical lifecycle via a technology-based invention, which leads to the development, production and marketing tasks striving for the commercial success of the invention."

Our definition implies that not all green product innovation offers environmental improvements in all three areas (i.e., materials/recourses, energy and pollution/toxic waste). Moreover, they are likely to occur at different stages in the product's physical lifecycle and can be incremental, really new or radical. For example, innovative packaging designs can be defined as incremental green innovations. Kenco coffee (2011), for example, introduced a refill pack for instant coffee. This innovation was by no means groundbreaking, yet it allowed the company to reduce packaging weight by 97%, significantly decreasing material and waste. Other innovation resulting in environmental improvements causes more disruption. For example, Dyson (1992) was the first company to design and market vacuum cleaners that needed no replacement bags and filters. Dyson's "bagless" vacuum cleaners are a good example of a really new product, which not only meant significant changes for end-users (i.e., no buying of replacement bags) but also reduced the amount of non-recyclable materials such as plastic or chemically treated paper.

Competitive advantage

More and more companies are coming to realize that complying with the most stringent rules before they are enforced can yield first-mover advantages and ultimately improve competitiveness (e.g. Nidumolu et al. 2009). For example, HP anticipated the ban on lead solders, and by the time the European Union's RoHS was introduced in 2006, HP already had a solution, giving it an advantage over its competitors (HP 2011). This win-win logic was first popularised by Porter and van der Linde (1995) who argued that environmental regulations can provide companies with the incentives to reduce, for example, pollution or packaging, which can lead to cost reductions or efficiency gains and result in improved competitiveness and higher profits. Thus, Porter and van der Linde (1995, p. 98) argue, "properly designed environmental standards can trigger innovation that may partially or more than fully offset the costs of complying with them".

Changing consumer preferences

Further, companies can utilize the greening of their products to improve their image and reputation and attract new customers by responding to and encouraging increasing environmental concerns and green consumer sentiment. Marks and Spencer (M&S), for example, has embarked on a journey to become the world's most sustainable major retailer. In its so-called Plan A, M&S dedicates itself to achieve 180 sustainability commitments by 2015. However, M&S not only responds to changing consumer preferences but is actively trying to engage its customers in behavioural change. For example, it launched M&S Energy in cooperation

with Scottish and Southern Energy, offering the provision of gas and electricity to private households. In order to attract new customers, M&S created incentive schemes that, for example, offer £30 M&S vouchers for all new customers who reduce energy usage by 10% in the first year, thus encouraging positive behavioural change.

Many trends seem to detect growing awareness of environmental issues and some studies even report that consumers might perceive "green as the new black" (e.g. Prothero et al. 2010). Responding to and encouraging these changing consumer preferences is therefore vital for business to attain market objectives and maintain a competitive advantage. However, Peattie (2001, p. 136) argues that the win-win logic of green product innovations, which are "environmentally superior, cost competitive, and technically as good as (if not better than) existing products" might prove difficult to realise. Dangelico and Pujari (2010) also highlight some controversy between consumers' green sentiment and their unwillingness to, for example, pay higher prices for environmentally superior products. Further, companies sometimes do not get praise for engaging in —greening|| their products, but instead get criticised for not doing enough. In this context an important problem companies and their stakeholders are facing is the lack of understanding of what constitutes a green or sustainable product innovation. Peattie (2001, p. 136) refers to it as the —green product controversy|| and points out that

"it is not difficult to demonstrate which is the fastest or the safest or the most inexpensive car on the market. It is much more difficult to define the greenest."

A common way to communicate green product attributes to consumers is via eco-labels (e.g. the US's Energy Star and Energy Guide, the EU's Flower and Energy Label, Japan's Eco Mark), which allow companies to differentiate their products from environmentally inferior alternatives, thus creating a source of competitive advantage (Belz and Peattie 2009). Yet to believe that a green product attribute alone is a compelling selling point is fallacy.

Green consumer behavior

The scope of the consumer behaviour literature, as pointed out by Gabriel and Lang (1995), borders on being 'unmanageable'. Peattie (2010, p.199) for example defines consumption as "an economic, a physical, and a social process influenced by the nature, circumstances, and psychology of individuals and the geography, culture, laws, politics and infrastructure of society in which they live." The definition implies the multifarious nature of consumer behaviours and the factors and influences that shape them. We therefore focus on "green" consumer behaviours and in particular on consumers' decision to adopt green innovations.²

In a comprehensive meta-review entitled *Green Consumption: Behaviour and Norms* Peattie (2010) traces the first conceptualisations of green consumer behaviour back to studies from the 1970s around "societal marketing". Since then green consumer behaviour has steadily grown as a field of research with contributions from disciplines like marketing, psychology, sociology, anthropology, environmental economics and human geography. Peattie (2010) broadly subdivides green consumer behaviour research into studies rooted in marketing, which examine consumer intentions and behaviour, and research rooted in industrial ecology and environmental economics, which are primarily concerned with ecological outcomes of green consumer behaviours.

Generally, green or pro-environmental behaviours (PEBs) can be defined as "purchase choice, product use and postuse, household management, collective, and consumer activism behaviours, reflecting some degree of environment-related motivation" (Peattie 2010, p.198).

The definition suggests that green consumer behaviour is not restricted to green purchases, but involves the acquisition, use and disposal of products, services, and practices (Bagozzi et al 2002). Pro-environmental consumption thus encompasses a wide range of behaviours like recycling of household wastes, using public

² For a comprehensive overview of the (green) consumer behaviour literature see Jackson (2005) or Gabriel and Lang (1995) among many others.

transport, conserving energy or water, purchasing green products, investing in ‘ethical funds’, buying organic foods or pursuing ‘voluntary simplicity’, amongst many others (Jackson 2005, p.3).

Factors and influences of green consumer behavior

Marketers and public policy makers are interested in factors that motivate and constrain pro-environmental behaviours, in order to utilise this knowledge in the design of interventions and campaigns, which aim to stimulate behavioural change. Researchers have thus developed models that serve as heuristic devices to explore particular types of pro-environmental behaviour and the factors that shape them. As pointed out by Jackson (2005, p.21)

"Understandings of consumer behaviour...rest, either explicitly or implicitly, on certain kinds of ‘models’ of what behaviour is, what its antecedents are, how it is influenced, shaped and constrained. These models are generally built from a set of conceptual premises, and some form of causal relationship between dependent and independent variables."

The discussion above has shown that a wide range of factors can contribute to whether or not consumers engage in a particular type of pro-environmental behaviour. However, the literature broadly distinguishes between *contextual* influences and *personal* factors that shape green behaviours (Stern 2005, Jackson 2005, Peattie 2010). According to Jackson (2005) external conditions relate to factors like institutional constraints, social norms or the availability of fiscal or regulatory incentives, which can either facilitate or constrain pro-environmental behaviours. A term regularly used in this context is 'lockin', referring to the external conditions, which circumscribe consumers' options to exercise certain behaviour. This implies that external factors like regulations, financial incentives or social norms can "leave little room for personal factors to affect behavior" (Stern 2005, p.10786).

Personal influences relate to attitudinal factors, personal capabilities and habits or routines (Stern 2005). Research in areas like social psychology has helped to reveal the influence of these factors on consumers' pro-environmental behaviours and intentions (Jackson 2005). However, Stern (2005, p. 10787) argues that personal influences are of particular interest to policy makers and marketers when contextual factors cannot be changed and personal factors may provide the only levers on behaviour. Generally, green consumption research applies (and sometimes adapts) established theories and models from consumer behaviour research in order to explain the influences of contextual and personal influences on particular pro-environmental behaviours (Peattie 2010). However, the distinction between personal and contextual factors suggests a disciplinary divide in green consumption research. Jackson (2005, p.23), for example, points out that the influence of external factors has been primarily researched in disciplines like behavioural analysis and institutional or evolutionary economics, whereas internal factors have received a lot of attention from researchers in areas like social-and cognitive psychology or marketing.

CONCLUSION

The *Harvard Business Review* recently referred to sustainability as an "emerging Megatrend" (Lubin and Esty 2010) and "the motherlode of organisational and technological innovation" (Nidumolu et al. 2009). Market research data show that across industries environmental sustainability is now a key driving force of product innovation.

For example, launches of green products in the US had doubled between 2007 and 2008 and were expected to triple in 2009 (Datamonitor 2009). Further, McKinsey and Company found in a global survey that about 50% of executives are taking climate change issues into consideration when developing new products. Green or sustainable innovations refer to products that "... strive to protect or enhance the natural environment by conserving energy and/or resources and reducing or eliminating use of toxic agents, pollution and waste" (Ottman et al. 2006, p. 24).

However, despite growing environmental concern and sentiment for environmental issues (e.g. Prothero et al. 2010), reported preferences for green products regularly fail to translate into purchase-behaviour, providing

serious challenges for innovating companies (e.g. Peattie 2001) companies often fail to acknowledge that green product attributes directly compete with conventional product characteristics like price, performance or design or require consumers to accept new usage patterns or to break with deep-rooted traditions and norms (Ram and Sheth 1989). Failing to address these issues is likely to result in consumer resistance and slow diffusion (e.g. Garcia et al. 2007). Yet empirical evidence about consumers' motives to resist innovation is scant. However, a key problem is that the resistance literature has suffered from conflicting conceptualisations, inconsistent terminology and a lack of measurement instruments to measure of resistance behaviour. For example, research shows that consumers can engage in different resistance behaviours (i.e. postponement, rejection, opposition) that reflect different resistance intensities and which are driven by different motivations. Yet the majority of empirical studies measure consumers' resistance indirectly as non-adoption, neglecting differences in resistance behaviour.

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