Toward Sustainability: Public Policy, Global Social Innovations for Base-of-the-Pyramid Markets, and Demarketing for a Better World

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ABSTRACT

In numerous country markets (particularly emerging and less developed markets), inadequate and/or ineffective investments in infrastructure and the resultant quantity and quality gaps in public goods (e.g., water, electricity, sanitation, public transportation) often require consumers to engage in ecologically harmful consumption behaviors that are inconsistent with their prosustainability attitudes and values. Quantity and quality gaps in public goods also have major social and economic consequences because they necessitate consumers at the base of the market pyramid to spend significant portions of their income to purchase substantially higher-priced substitute private goods. This article presents a framework of the interdependencies among public policy actions, quantity and quality gaps in public goods, abnormal demand for certain broad types of unsustainability-accentuating products (intrinsically zero demand, intrinsically lower demand, and ecologically more harmful substitute products), sustainability-facilitating consumption behaviors (consumption elimination, reduction, and redirection), and sustainability-facilitating demand effects (demand elimination, reduction, and redirection). Implications for public policy actions, global social innovations for base-of-the-pyramid markets, demarketing, and opportunities for further research are discussed.

Keywords: sustainability, public goods, global social innovations, base-of-the-pyramid markets, demarketing

In many country markets, due to a dearth of public policy actions and/or ineffective public policy actions, various public goods (e.g., water, electricity, sanitation, public transportation) suffer from significant quantity gaps (i.e., demand for a public good exceeding supply) and/or quality gaps (i.e., quality of a public good being lower than recommended standards, e.g., the World Health Organization's standards for drinking water). As illustrated subsequently, in such environments, decision makers in organizations as well as individual consumers may be constrained from engaging in environmentally sustainable behaviors that are consistent with their prosustainability attitudes. Consider the following examples:

> In India, where rapid growth and urbanization have saddled megacities with smog and congestion, a better bus system is as good for the environment as it is for travelers. The Energy and Resources Institute found that increasing bus trips from 62% to 80% of travel in Bangalore would reduce fuel consumption by 21% and CO_2 emissions by 13% over 15 years. (Wolverson 2012, p. 10)
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> Still, as Indian incomes rise and the government pours billions into crumbling roads, more affluent travelers see cars as an escape from rickety, unreliable buses. Only 4.7% of Indian households

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> have a car now, but annual car sales are expected to quadruple to 9 million by 2020, according to the Society of Indian Automobile Manufacturers, especially, as more low cost models hit India. The implications for the environment are grim: cars and two wheelers contribute 60% to 90% of CO_2 emissions in Indian cities, compared to 3% to 21% for buses. (Wolverson 2012, p. 10)

These vignettes offer insights into two interrelated consequences of quantity and quality gaps in public goods: (1) demand shift from a public good to a more expensive substitute private good (from mass transit service to private ownership of transportation vehicles) and (2) demand shift from an ecologically less harmful to an ecologically more harmful substitute product (from use of mass transit service to privately owned vehicles). In addition to adverse environmental sustainability consequences, quantity and quality gaps in public goods also have adverse social and economic sustainability consequences because consumers at the base of the market pyramid (in developed, emerging, and/or less developed markets) must spend a significant portion of their limited disposable income to purchase higher-priced substitute private goods. The following vignettes offer further insight into this issue:

> Seville ... is one of dozens of predominantly Latino unincorporated communities in the Central Valley [California] plagued for decades by contaminated drinking water. In farmworker communities like Seville,... where the average yearly income is $14,000, residents ... [use] tap water ... to shower and wash clothes [but buy] ... five-gallon bottles for drinking, cooking and brushing their teeth.... Many spend up to 10 percent of their income on water. (Brown 2012)

> A television ad in China for Nestlé's Pure Life brand of bottled water shows children making unhappy faces after tasting water. One child pours his glass into a fish tank instead of drinking it; his face lights up when his mother offers Pure Life instead. Water quality is a big concern for Chinese consumers. They're turning to bottled water as a safer alternative.... Sales of bottled water in the country will climb to $16 billion by 2017, up from $9 billion in 2012 and $1 billion in 2000.... About half of the water Nestlé sells in China is delivered in five-gallon jugs. In Shanghai, Nestlé has opened 12 water stores where customers can phone in orders. (Doherty 2013)

From the standpoint of achieving societal sustainability goals, these examples underscore the importance of *redirecting consumption* from ecologically more harmful private goods to ecologically less harmful substitute public goods and, relatedly, *reducing consumption* of ecologically more harmful private goods. At a more fundamental level, the challenge is to identify and leverage product-market opportunities for consumption elimination, reduction, and redirection (and, in turn, demand elimination, reduction, and redirection) through the alleviation of quantity and quality gaps in substitute public goods. From the standpoint of corporate social responsibility (CSR) and social legitimacy, the vignettes highlight potential innovation opportunities that merit greater attention from multinational corporations (MNCs)—specifically, global social innovations for base-of-the-pyramid markets in response to the persistence of quantity and quality gaps in public goods.

Against this backdrop, the objectives of this article are threefold. The first objective is to present a conceptual framework delineating the linkages among public policy actions, quantity and quality gaps in public goods, demand for three broad types of unsustainability-accentuating products (intrinsically zero demand [IZD], intrinsically lower demand [ILD], and ecologically more harmful substitute [EMHS] products), three key sustainability-facilitating consumption behaviors (consumption elimination, reduction, and redirection), three key sustainability-facilitating demand effects (demand elimination, reduction, and redirection), and societal progress toward sustainability. The proposed framework and related discussion provide insights into how inadequacies in the infrastructure underlying the provision of specific public goods lead to quantity and quality gaps in specific public goods and result in abnormal demand for specific IZD, ILD, and EMHS products and, in turn, adverse sustainability consequences. The prevalence of abnormal demand for various IZD, ILD, and EMHS products (and the consequent adverse impact on environmental sustainability) tend to be more pronounced in emerging and less developed markets. As such, these markets also draw attention to the importance of facilitating societal progress toward sustainability by creating macroenvironmental market conditions that are conducive to the consumption elimination of specific IZD products, consumption reduction of specific ILD products, and consumption redirection from specific EMHS products to ecologically less harmful substitute (ELHS) products.

The second objective is to highlight the need for MNCs to pay greater attention to global social innovations for base-

of-the-pyramid markets in their innovation portfolios—specifically, innovations with the potential to alleviate the social and economic consequences of quantity and quality gaps in public goods in emerging and less developed markets. A large body of research has focused on myriad issues relating to profitably serving customers at the base of the market pyramid (London and Hart 2004; Prahalad 2012; Prahalad and Hammond 2002). The current research specifically examines base of the market pyramid–focused innovations in the context of quantity and quality gaps in public goods. The third objective of this article is to explore the role of demarketing in tandem with the alleviation of quantity and quality gaps in public goods to facilitate consumption elimination, reduction, and redirection of specific IZD, ILD, and EMHS products.

The article is organized as follows. First, an overview of relevant literature is presented. Second, a conceptual framework delineating the linkages among public policy actions; quantity and quality gaps in public goods, abnormal demand for IZD, ILD, and EMHS products; and sustainability effects is provided. Third, IZD, ILD, and EMHS products are discussed, including definitions, illustrative examples, and the negative environmental sustainability consequences of abnormal demand for these products. Fourth, implications for public policy, global social innovations for base-of-the-pyramid markets, demarketing, and further research are offered.

LITERATURE OVERVIEW

Sustainability

In recent years, issues relating to environmental sustainability have steadily risen in importance as principal concerns of individual consumers and consumer groups, for-profit and not-for-profit organizations, governments and nongovernmental organizations, public interest groups and other stakeholder groups, and researchers in various academic disciplines. One of the most widely cited definitions of sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987, p. 8). However, meeting humanity's various needs entails the use of both renewable and nonrenewable resources. As Godfray et al. (2010) point out, although the principle of sustainability implies the use of renewable resources at rates that do not exceed the Earth's capacity to replenish them, by definition, dependency on nonrenewable resources is unsustainable, even if it is necessary as part of a trajectory toward short-term sustainability. In a related vein, Ehrenfeld (2005) notes that reducing unsustainability is not the same as creating sustainability, and one is not simply the converse of the other. He further asserts that, for the most part, firms' actions fall in the realm of slowing unsustainability rather than creating sustainability.

Sustainability and Marketing

A large body of literature published under the rubrics of sustainable marketing/sustainable marketing practices (Sharma et al. 2010; Van Dam and Apeldoorn 1996), sustainable consumption behaviors/sustainability and consumer behavior (Goldstein, Cialdini, and Griskevicius 2008; Luchs et al. 2010), environmental marketing/enviropreneurial marketing/green marketing (Menon and Menon 1997; Varadarajan 1992), proenvironmental demarketing (Grinstein and Nisan 2009), and social marketing (Peattie and Peattie 2008) provide valuable insights into issues relating to sustainability and marketing. Leonidou, Katsikeas, and Morgan (2013) note that much extant literature on sustainability addresses one or more of the following five key issues: sustainability's (1) external and internal drivers, (2) management, (3) performance outcomes, (4) marketing aspects, and (5) consumer aspects.

Researchers have employed extant theories to gain insights into specific consumer-related (e.g., consumers' attitudes and behaviors) and business-related (e.g., firm behavior) sustainability issues. Drawing on multiple literature streams, Gyene (2012) provides a review of theory and research on prosustainability attitude and behavior. Polonsky et al. (2012) use theory of reasoned action (Ajzen and Fishbein 1980) to study the effect of consumers' general and carbon-related environmental knowledge on their attitudes toward the environment, general proenvironmental behaviors, and carbon offset–related behaviors. Moons and De Pelsmacker (2012) build on the theory of planned behavior (Ajzen 1985) to study the role of emotions on consumers' electric car usage intentions. Schultz and Holbrook (1999) explore the relevance of the tragedy of commons (Hardin 1968) as a theoretical lens for the study of environmental issues in marketing. Griskevicius, Cantu, and Van Vugt (2012) investigate the evolutionary bases of sustainable behaviors.

In reference to sustainability-related issues pertaining to behavior of firms, Hunt (2011) provides an exposition of the potential relevance of resource advantage theory. Connelly, Ketchen, and Slater (2011) review the potential relevance of nine organizational theories (transac-

tion cost economics, agency theory, institutional theory, organizational ecology, resource dependence theory, the resource-based view of the firm, upper echelons theory, social network theory, and signaling theory) for research in the field of sustainability. Drawing on the resource-based view of the firm and industrial organization theory, Leonidou et al. (2013) model organizational resources (green export-related physical resources, financial resources, and experiential resources) and capabilities (green export-related shared vision, cross-functional coordination, and technology sensing/response) as antecedents of eco-friendly export marketing strategy.

Sustainability in an Environment of Globalization of Markets and Global Marketing

> The corporate sector has the incentive, operational know-how, scalability, and ingenuity to respond to the global challenges we face today, challenges on all four fronts—social, economic, environmental, and cultural. Why? Because, by the beginning of the twenty-first century, over half of the world's hundred largest economies were corporations.... Two-thirds of the global trade is accounted for by just five hundred corporations. With this power comes higher expectations. Society increasingly holds global businesses accountable as the only institutions powerful enough to respond at the scale of the challenges that our planet faces. There is no multinational government, but there are many cross-border corporations that witness how resource constraints affect markets, customers, communities, and natural habitats. (Werbach 2009, p. 3)

By their nature, sustainability-related issues (e.g., carbon emissions, depletion and degradation of the world's natural resources) transcend national borders. Understandably, myriad sustainability-related issues have been the focus of consortia of international governmental bodies (e.g., Intergovernmental Panel on Climate Change), consortia of MNCs (e.g., World Business Council for Sustainable Development), individual governments and firms, and other institutions. For example, a 2008 briefing paper on sustainability across borders (Economist Intelligence Unit 2008) reports that MNCs were about evenly split between those employing a globally unified approach versus a more regionally focused approach in addressing sustainability-related issues but, at the same time, were involved in ongoing efforts to determine the ideal mix. A globally unified approach to sustainability is conceptualized in the Economist Intelligence Unit report as one that emphasizes uniform environmental and social priorities and policies across the company, as well as highly consistent processes and techniques for the achievement of sustainability goals. Notwithstanding the emphasis on maintaining as much uniformity as possible, the report notes that a globally unified approach does not preclude making adjustments at local levels when necessary. A regionally focused approach is conceptualized as one that emphasizes a firm's choices of priorities and policies and the sustainability needs of the different regional and local societies and environments in which it operates.

Table 1 provides an overview of the major findings of three global surveys of senior executives of MNCs, respectively focusing on the (1) top three strategic sustainability-related priorities (Economist Intelligence Unit 2008), (2) major sustainability-related areas of emphasis (*McKinsey Quarterly* 2011), and (3) perceived benefits of addressing sustainability-related issues (Haanaes et al. 2011; a joint study by the Boston Consulting Group and *MIT Sloan Management Review*). These findings are pertinent in the context of extant perspectives on the CSR and social legitimacy of MNCs (briefly discussed next) and implications for MNCs (public–private partnerships in the provision of public goods and base of the market pyramid–focused global social innovations, discussed subsequently).

Corporate social responsibility refers to "a firm's consideration of, and response to, issues beyond the narrow economic, technical, and legal requirements of the firms" (Davis 1973, p. 312). Sustainability-related behaviors are chief among the activities integral to firms' CSR. For example, drawing on extant literature, Wang and Bansal (2012) list the following CSR activities of firms: (1) developing products that have social and environmental features, (2) adopting production methods that reduce environmental impacts, (3) employing human resource systems that care for employees and nurture labor relationships, (4) investing in infrastructure development for local communities, and (5) pursuing philanthropic activities. Wang and Bansal measure a firm's extent of involvement in CSR by classifying CSR activities into the following categories: activities pertaining to (1) the environment (e.g., using biodegradable materials for packing shipments), (2) products and production (e.g., producing products using recycled materials), (3) community (e.g., giving a percentage of the firm's profits back to the community), (4) employee relations (e.g., building a work environment that is free of harassment and discrimination), and (5) other stakeholders

Table 1. Toward Sustainability: Sustainability-Related Areas of Emphasis of MNCs and Perceived Benefits

Top Three Sustainability-Related Priorities of Companies: Global Survey of Executives (Economist Intelligence Unit 2008)	Major Sustainability-Related Areas of Emphasis of Companies: Global Survey of Executives (McKinsey Quarterly 2011)	Potential Benefits of Addressing Sustainability Related Issues: Global Survey of Executives (Haanaes et al. 2011)
Improving energy efficiency	Reducing energy use in operations	Reduced costs due to energy efficiency
Reducing greenhouse gas emissions, waste, water, and polluting effluents	Reducing waste from operations	Reduced costs due to material or waste efficiencies
Reducing products' environmental impact	Reducing emissions from operations	
	Reducing water use in operations	
	Responding to regulatory constraints or opportunities	Improved regulatory compliance
	Mitigating operational risk related to climate change	Reduced risk
Developing new products/services to reduce societal or environmental risk	Committing research and development resources to sustainable products	Better innovation of product/service offerings
Modifying existing products/services to reduce societal or environmental risk	Managing impact of products throughout the value chain	Better innovation of business models and processes
	Managing portfolio to capture trends in sustainability	Increased competitive advantage
	Leveraging sustainability of existing products to reach new customers or markets	Access to new markets
Implementing stronger controls over suppliers on environmental standards	Managing corporate reputation for sustainability	Improved brand reputation
Implementing stronger controls over suppliers on workers' rights standards		Improved perception of how well the company is managed
Improving the local environment around operating facilities		
	Achieving higher prices or greater market share from sustainable products	Increased margins or market share due to sustainability positioning
	Improving employee retention and/or motivation related to sustainability activities	Improved ability to attract and retain top talent
		Increased employee productivity
		Enhanced investor/stakeholder relations
Working with governments to promote sustainable development in the countries where they operate		

Notes: Responses are not listed in the order of percentage of respondents identifying specific sustainability-related initiatives as one of their top three strategic priorities (column 1), specific initiatives as their current areas of emphasis (column 2), or specific benefits as potential benefits (column 3). Instead, they are presented in an order that serves to highlight convergent and divergent findings across the three studies.

(e.g., supporting charitable organizations locally and internationally).

Suchman (1995, p. 574) defines organizational legitimacy as "a generalized perception or assumption that the actions of a firm are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." Hawn (2013) notes that social legitimacy through engagement in CSR can help firms gain access to nonmarket gatekeepers and, thus, to international markets. Building on extant literature, Hawn posits that engagement in CSR can help MNCs ensure organizational legitimacy by (1) meeting the norms and values of social actors in host countries, (2) conforming to local stakeholders' expectations in an environment of institutionalization and global diffusion of CSR as a global norm for doing business, and (3) developing a particular type of intangible asset that aids companies in overcoming nationalistic barriers and facilitating globalization.

National Public Goods and Global Public Goods

A public good is conceptualized in extant literature as possessing one or both of the following properties: (1) nonrivalness of consumption—consumption of the good by one person does not prevent others from consuming the good, and (2) nonexclusion—people who do not share in paying for the good cannot be excluded from consuming it (Boddewyn and Doh 2011, pp. 347–48, footnote 4; Chamberlin 1974). Pure public goods are goods that evidence both of these properties, and quasi-public goods are goods that evidence only one (rivalrous and nonexcludable or nonrivalrous and excludable). In contrast to private goods that are both depletable and excludable, public goods (e.g., lighthouses, traffic lights) are both nondepletable and nonexcludable. Public roads and beaches, national defense, and police and fire protection are also illustrative of public goods. Characterization of public goods as goods that (1) are fundamental to people's well-being, (2) governments and markets must work together to provide, and (3) serve people's common interests (see Kaul, Grunberg, and Stern 1999) also provides a perspective of their essential nature.

"Collective goods," "infrastructure goods," "common goods," and "social goods" are among the terms used in previous literature either interchangeably or in a conceptually overlapping manner with public goods. For example, Boddewyn and Doh (2011, p. 347) use the term "collective goods" in reference to products such as health, education, communication, transportation, water, and electricity that provide positive externalities to local publics and whose supply can be assured by public agencies and/or private for-profit and not-for-profit organizations. In their research focusing on access to public goods in an emerging market context, Banerjee and Somanathan (2007) focus on schools, hospitals, piped water, electricity, telephones, and paved roads.

Doering (2007) discusses the inherent challenges of determining a stable range and extent of public goods, historically and by definition. He further notes that operationally, democratic societies determine the goods and services that the public should be involved in providing. He draws attention to utilities (e.g., roads) and services (e.g., delivery of letters and packages) that are both public and private and notes that publicly financed higher education is being increasingly redefined as a private good that deserves less public support on the basis of a narrower view of who benefits and what the benefits are.

Extrapolating the concept of public goods from a national to a global level, Kaul, Grunberg, and Stern (1999) provide an overview of global public goods (as well as "global public bads," such as global warming and transnational pollution). They note that, in addition to the properties of nonrivalry in consumption and nonexcludability, a third property of global public goods is that their benefits are quasi-universal in terms of countries (covering more than one group of countries), people (accruing to several, preferably all population groups), and generations (extending to both current and future generations, or at the least meeting the needs of current generations without foreclosing development options for future generations).

Quantity and Quality Gaps in Public Goods

Cochran and Malone (1995, p. 11) define "public policy" as "purposeful, goal-oriented action that is taken by government to deal with societal problems." As noted previously, in several country markets, due to a dearth of public policy actions and/or ineffective public policy actions, several public goods evidence significant quantity and/or quality gaps. A large body of literature has focused on the causes underlying the failure of governments to provide basic public goods to their citizens in sufficient quantity and of acceptable quality and has suggested potential remedies (Banerjee, Iyer, and Somanathan 2008; Banerjee and Somanathan 2007). For example, Khanna and Palepu (1997) attribute the failure of governments to provide essential necessities for modern life such as education, electricity, health, transporta-

tion, and water to public sector incapacity. The reasons underlying the inadequate infrastructure for specific public goods (e.g., power, public transportation, communication, health, sanitation) in a particular market economy (country) could be varied, including monopolistic economic policies (e.g., electric power generation, transmission, and/or distribution being state monopolies—the exclusive province of state-owned enterprises), lack of resources, competing demands on limited resources, and a significant portion of the resources allocated for specific infrastructural projects being siphoned off due to graft and corruption. An in-depth discussion of these issues is beyond the scope of this article.

TOWARD SUSTAINABILITY: FOSTERING MARKET CONDITIONS CONDUCIVE TO CONSUMPTION ELIMINATION, REDUCTION, AND REDIRECTION THROUGH PUBLIC POLICY ACTIONS

Engendering proenvironmental behaviors in the general public requires cooperation and collaboration among the government, the general public, and businesses. For example, in reference to the role of consumers in helping the government achieve its targets for reduced energy consumption, McDonald et al. (2012) highlight the importance of consumers engaging in more sustainable waste management practices and lifestyles with fewer environmental consequences. In addition, the government plays an important role in creating macro-environmental market conditions that are conducive for consumers and businesses to be able to engage in sustainable consumption behaviors. For example, Jackson (2009) points out that in the absence of the government enacting effective policies, the extent to which consumers can act on their prosustainability attitudes is likely to be severely limited. In a similar vein, Thøgersen (2005) notes that several barriers to sustainable consumption behavior are rooted in the impact of public policy actions such as the availability and quality of public transportation. Although effective public policy actions are crucial for *creating* conditions that are conducive for consumers and businesses to engage in sustainable behaviors such as consumption elimination, reduction, and redirection, ineffective and/or inadequate public policy actions lead to market conditions that *necessitate* consumers and businesses to engage in unsustainable consumption behaviors.

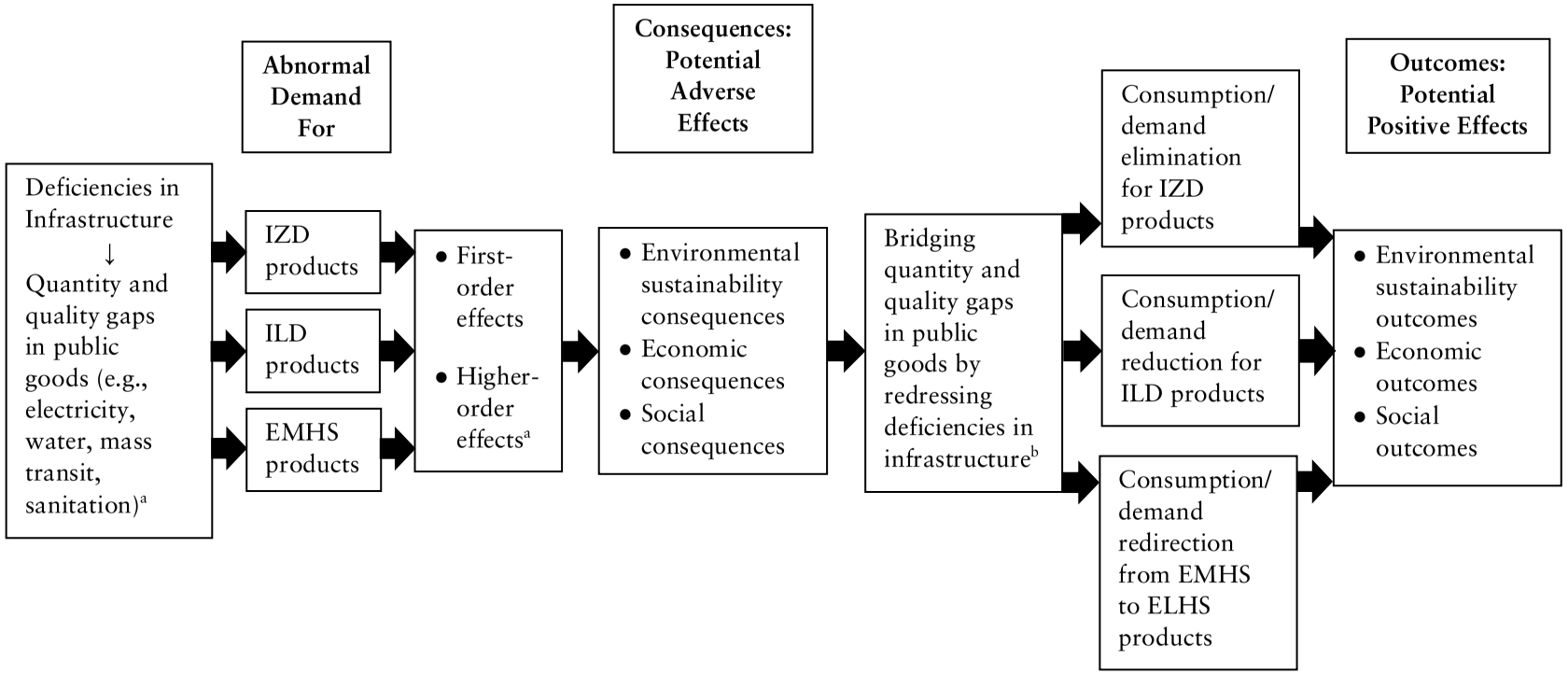
Steg and Vlek (2009) broadly distinguish information strategies and structural strategies as alternative approaches to promoting proenvironmental behavior. "Information strategies" refer to efforts directed at changing consumers' perceptions, motivations, knowledge, and norms, without actually changing the external context in which they make their choices. "Structural strategies" refer to efforts directed at changing contextual factors such as the availability and the actual costs and benefits of behavioral alternatives. When it is costly or difficult for consumers to act proenvironmentally due to external barriers to proenvironmental actions, changes in the circumstances under which behavioral choices are made may be needed to increase individual opportunities to act proenvironmentally and make proenvironmental behavior choices relatively more attractive (see Steg and Vlek 2009).

Against this backdrop, Figure 1 presents a conceptual framework (not an empirically testable model) highlighting the role of public policy actions in the creation of macro-environmental market conditions that are conducive to fostering sustainable behaviors in consumers and businesses (i.e., consumption elimination, reduction, and redirection). The framework delineates the linkages between public policy actions, quantity and quality gaps in public goods, abnormal demand for three broad types of unsustainability-accentuating products (IZD, ILD, and EMHS products), three key sustainability-facilitating consumption behaviors (consumption elimination, reduction, and redirection), and three key sustainability-facilitating demand effects (demand elimination, reduction, and redirection). The linkages delineated in the proposed framework are stated formally as follows:

1. Deficiencies in infrastructure underlying a public good result in quantity gaps (e.g., intermittent supply of water and electricity supplied to households) and/or quality gaps (e.g., impurities in water, severe voltage fluctuations in electricity) in the public good.

2. Quantity and quality gaps in certain public goods stimulate demand for certain private goods for which there would be no demand in the absence of quantity and quality gaps in the underlying public good. That is, they are *intrinsically* zero demand products products. For example, in several country markets, there is a high level of demand for captive electric power generation equipment in factories, offices, and commercial establishments due to chronic quantity gaps in the electric power supplied by public utilities.

Figure 1. Toward Sustainability: Fostering Macro Environmental Market Conditions Conducive to Consumption Elimination, Reduction, and Redirection Through Public Policy Actions



[a]For examples of quantity and quality gaps in collective goods, the demand effects of the gaps, and first- and higher-order effects, see the Appendix.
[b]In the broader context of consumption elimination, reduction, and redirection (and thereby, demand elimination, reduction, and redirection, respectively), alleviation of infrastructure deficiencies is one of several alternative mechanisms. Other mechanisms include environmental awareness promotion among the general public, legislation and regulation, monetary and nonmonetary incentives and disincentives, and new technologies and innovations.

3. Quantity and quality gaps in certain other public goods stimulate a higher level of demand for certain private goods than would be the case in the absence of quantity and quality gaps in the underlying public good. That is, they are *intrinsically* lower-demand products. For example, in several country markets, a significant portion of the total demand for bottled water for in-home consumption is attributable to chronic quantity and quality gaps in piped water supplied by public utilities.

4. Quantity and quality gaps in still other public goods stimulate a higher level of demand for EMHS products. For example, some percentage of the total demand for personal transportation vehicles (cars and two-wheelers) in almost every country market is attributable to quantity and quality gaps in the substitute public good—namely, mass transit service. Compared with the private good, the public good is an ELHS product.

5. Abnormal demand for IZD, ILD, and EMHS products have a negative impact on environmental sustainability due to the greater environmental impact of these products compared with the corresponding substitute public goods. Although Figure 1 broadly classifies products that evidence abnormal demand due to quantity and quality gaps in specific public goods as IZD, ILD, and EMHS products, relative to the public good for which they are substitutes, IZD and ILD products are also ecologically more harmful.

6. Public policy actions undertaken to remedy deficiencies in infrastructure underlying quantity and quality gaps in specific public goods create macro-environmental market conditions that are conducive for consumption elimination of specific IZD products, consumption reduction of specific ILD products, and consumption redirection from specific EMHS products to ELHS products.

7. The cumulative effect of consumption elimination, reduction, and redirection spanning a multiplicity of IZD, ILD, and EMHS products, respectively, on the demand for underlying renewable and nonrenewable resources can make a significant contribution to societal progress toward environmental sustainability.

Next, the characteristics of IZD, ILD and EMHS products, formal definitions, and illustrative examples are discussed.

IZD Products

> The power crisis in the state has come as a boon to manufacturers of inverters and generators. With frequent power outages—both scheduled and unannounced—in the city and across the state, sales of these electronic equipment have shot up.
>
> While the maximum demand for inverters are from the western zone, where power cuts extend up to eight hours a day, harried residents in the city, too, are preparing for the worst. (Karthick 2012)

This vignette illustrates the prevalence of abnormal demand in certain country markets for a class of products, referred to herein as IZD products. An IZD product is defined as a private substitute good or a private complementary good for a public good that would have zero demand in a product-market in the absence of quantity and quality gaps in the public good and has positive demand under conditions of prevalence of quantity and quality gaps in the public good. Without deficient infrastructure and the resultant quantity and quality gaps in the substitute public good, there would be no demand for such products. Thus, IZD products are referred to as *intrinsically* (i.e., inherently or essentially) zero-demand products. When the infrastructural deficiencies underlying the quantity and/or quality gaps in the public good are redressed, the demand for the corresponding IZD products will gravitate toward zero.

As the proposed definition states, whereas certain IZD products tend to be substitute products for specific public goods (e.g., demand for captive power generation equipment in the institutional market [factories and commercial establishments] due to quantity gaps in electric power as a public good supplied by a public utility), other IZD products tend to be complementary products for specific public goods (e.g., demand for surge protectors and voltage stabilizers due to quality gaps [severe voltage fluctuations] in the electric power supplied by a public utility, demand for water purification devices in the consumer and institutional markets due to quality gaps in the piped water supplied by a public utility). However, as the illustrative examples suggest, unlike traditional complementary products (e.g., video game console and video games, DVD player and DVDs), the demand for an IZD product as a complementary prod-

uct will exist only under conditions of prevalence of quantity and/or quality gaps in the public good.

The characterization of products as IZD, ILD, or EMHS is in reference to a specific market type or market segment and not the aggregate market at large. Consider the market for electric power inverters for installation in households as a backup source of power supply. Such inverters are IZD products for the household segment of the larger market for the product. In country markets with significant quantity gaps in electric power as a public good (frequent power outages and/or for long durations), there is an abnormal and increasing demand for electric power inverters as a backup source of power in households. When the AC power grid is live, the device converts and stores electrical energy in DC form. During power outages, the energy stored in DC form is converted into AC to operate light bulbs, household electrical appliances, electronic home entertainment devices, and other devices. Although there is likely to be zero demand for this product as a household product in country markets in which power outages are rare occurrences, in country markets with frequent power outages, the market for electric power inverters as a backup source of power in households is sizeable.

ILD Products

> It's a simple warning—don't drink the tap water—and Mexicans take it to heart as much as any foreign tourist does. Mexicans drink more bottled water than the citizens of any other country do, an average of 61.8 gallons per person each year, according to the Beverage Marketing Corp., a consultancy. That's far higher than Italy, and more than twice as much as in the United States. A rising mistrust of tap water is behind the thirst for bottled water. Other factors are also at play, however, including clever advertising campaigns by multinational corporations and the failure of the Mexican government to provide timely data on water safety. (Johnson 2010)

This vignette highlights the prevalence of abnormal demand in certain country markets for a class of products, referred to here as ILD products. An ILD product is defined as a private substitute good for a public good that would have a lower level of demand in a product-market in the absence of quantity and quality gaps in the public good compared with the level of demand that will prevail under conditions of prevalence of quantity and quality gaps in the public good. Intrinsically lower-demand products are substitute products for public goods (e.g., demand for bottled water for consumption at home due to quantity and quality gaps in tap water). Understandably, a sizeable portion of the total demand for bottled water is attributable to its time utility, place utility, and form utility (e.g., for consumption at places such as stadiums and theme parks, refugee relief camps, army outposts). However, it is conceivable that a significant portion of the total demand would dissipate under conditions of the substitute public good (water piped to households and commercial establishments) being available in sufficient quantity (i.e., absence of quantity gap) and being of acceptable quality (i.e., absence of quality gap).

The market for mosquito repellent is also illustrative of an ILD product in the context of several country markets. In an urban living environment, under normal circumstances, the need to use the product may be infrequent or occasional (e.g., following unusually heavy rainfall, while working in the backyard, while walking in a thickly wooded public park). However, in market environments characterized by severely deficient sanitation infrastructure, due to stagnant pools of water serving as breeding grounds for mosquitoes, a broad cross-section of the population may need to use the product daily and year round rather than occasionally. One of the earlier product forms of mosquito repellent was a slow-burn coil that, when lit at bedtime, lasted for approximately eight hours. In light of a growing market, increasing competition, and the attendant imperative for greater differentiation through innovation, mosquito repellent is currently available in emerging and less developed markets in several forms (e.g., slow-burn coil, cream, lotion, spray, electric plug-in) and price points. Recent high-end offerings include an electric plug-in mosquito repellent with dual mode (a feature that enables customers to set the product to operate overnight at normal or active mode depending on the severity of mosquito infestation).

EMHS Products

> India has a dire need of mobility solutions for the masses. The time lag in launching infrastructure options such as mass transit systems to bridge this gap is huge. Two-wheelers have been growing at a steady clip precisely for this reason. (Knowledge@Wharton 2011)

> In India, Gurgaon epitomizes that reality, managing to be both a complete mess and an economic

> powerhouse, a microcosm of Indian dynamism and dysfunction. In Gurgaon, economic growth is often the product of a private sector improvising to overcome the inadequacies of the government. To compensate for electricity blackouts, Gurgaon's companies and real estate developers operate massive diesel generators capable of powering small towns. No water? Drill private borewells. No public transportation? Companies employ hundreds of private buses and taxis. (Yardely 2011)

These vignettes pertaining to demand drivers for two-wheelers in the business-to-consumer (B2C) market and for captive electric power generation equipment in the business-to-business (B2B) market, respectively, are illustrative of abnormal demand for EMHS products due to quantity and quality gaps in corresponding ELHS public goods. Substitute products can be plotted on an ecological impact continuum and rank ordered from ecologically least harmful to most harmful, drawing on their relative environmental impact over their life cycle (i.e., their carbon footprint spanning resource extraction, manufacturing, distribution, consumption, and disposal). In line with their relative environmental impact, they can also be broadly categorized as ELHS versus EMHS products. An EMHS product is defined as a private good whose environmental impact through its life cycle is greater than the public good or a private good for which it is a substitute.

First-Order and Higher-Order Effects of Quantity and Quality Gaps

The first-order effect of quantity and quality gaps in a public good is the resultant abnormal demand for specific IZD, ILD, or EMHS products. For example, a first-order effect of frequent power outages is the demand for power inverters as a backup source of power supply. A higher-order effect is the cost reductions realized by manufacturers of the product in an environment of increasing demand for the product (e.g., due to economies of scale in procurement, manufacturing, and distribution) and advances in technology efficiency. When some or all of these cost reductions are passed on to potential buyers in the form of lower prices, a resulting higher-order effect is an increase in demand for the product because it is now affordable for a greater number of households. Another higher-order effect of technology-enabled cost reductions is a product with more features and/or larger capacity becoming more affordable. For example, in place of an electric power inverter with the capacity to power a few lights and household appliances, as prices decrease, more households will be able to afford higher-capacity inverters that can power a greater number of lights and appliances during power outages.

Illustrative of the first-order demand effects of quantity gaps in water piped to households (being available to households only on specific days in a week and/or specific hours each day) is the abnormal demand for products such as (1) bottled water for in-home consumption, (2) home delivery of water in larger capacity containers, (3) rooftop or underground water storage tanks, (4) electric motors to pump water into storage tanks, and (5) trucks customized to transport water for home delivery of water. Illustrative of first-order demand effects of quality gaps (impurities in tap water) is the demand for (1) in-home water filtration devices, (2) health care–related services (e.g., physician services, lab services, hospital beds, medicine) in the aftermath of consumption of impure tap water and being afflicted with waterborne illnesses, and (3) fossil fuel used for boiling municipal tap water before drinking. Illustrative of higher-order effects of quantity gaps is the demand for fossil fuel used for transporting water by trucks and electricity used to run motors to pump water into storage tanks. The Appendix provides examples of the demand effects (demand for specific IZD, ILD, and EMHS products) of quality and quantity gaps in specific public goods.

DISCUSSION

A prescient and oft-mentioned characterization of successful new-to-the-world products is as products that did not exist yesterday, but most people worldwide cannot live without today. In a similar vein, IZD, ILD, and EMHS products can be characterized as follows: (1) An IZD product is one that either a broad cross-section of the population or specific segments of the population in a country market cannot envision living without today but will no longer need after the infrastructural inadequacies underlying quantity and quality gaps in the substitute public good are remedied. (2) An ILD product is one that a broad cross-section of the population in a country market will consume less of after the infrastructural inadequacies underlying quantity and quality gaps in the substitute public good are remedied. (3) An EMHS product is one from which a broad cross-section of the population in a country market will redirect their consumption to an ELHS public good after the infrastructural inadequacies underlying quantity and quality gaps in the public good are remedied.

In this section, after a broad discussion on implications for public policy, implications for innovation and demarketing are addressed in the context of the following scenarios. Implications for (1) base of the market pyramid–focused global social innovations in a scenario of persistence of significant quantity and quality gaps in public goods and, in turn, persistence of abnormal demand for various IZD, ILD, and EMHS products and (2) demarketing in a scenario of significant progress toward the elimination of quantity and quality gaps in various public goods through public policy actions and, thereby, the creation of macro-environmental market conditions that are conducive for consumption elimination, reduction, and redirection of specific IZD, ILD, and EMHS products, respectively.

Implications for Public Policy

> Before adding lanes to clogged highways, employers and states could encourage telecommuting, carpooling and mass transit to take cars off the road. Or freight-rail improvements to take trucks off the road. Or computerized traffic management to steer drivers away from jams. Or zoning changes to allow denser housing near job centers and train stations. Such a change of thinking requires a creative approach to the laws of supply and demand, with a goal of reducing demand (for landfills, power plants, jails, even sewers) before adding supply. (Grunwald 2011, p. 38)

This observation regarding managing the imbalance between demand and supply through demand reduction versus supply increase is instructive. Although abnormal demand for certain IZD, ILD, and EMHS products may be more pronounced in emerging and less developed markets, as basic product concepts, they transcend all types of markets. Likewise, consumption elimination, reduction, and redirection as basic consumption concepts, and demand elimination, reduction, and redirection as basic demand concepts, transcend all types of markets. Although there may be a greater need for increasing the supply of infrastructure in emerging and less developed markets, creative approaches to reducing the demand for additional infrastructure is part of a solution that transcends all types of markets.

All else being equal, producers of private goods are likely to place a much greater emphasis on product-market opportunities for consumption redirection than on opportunities for consumption elimination or reduction (e.g., innovation-driven consumption redirection, such as [1] from tungsten filament–based light bulbs to longer-lasting and more energy-efficient compact fluorescent light bulbs and [2] from regular formulations of laundry detergents to ecologically less harmful formulations such as phosphate-free formulation, cold water formulation, and single-rinse formulation). As a result, public policy actions assume greater importance in the context of identifying and leveraging opportunities for consumption/demand elimination of IZD products and consumption/demand reduction of ILD products.

In the past, researchers have viewed development of infrastructure underlying various public goods as the exclusive responsibility of the government; however, in recent years, viewing public–private partnerships and private initiatives as complementing government initiatives, thereby accelerating the creation of environmental conditions conducive to consumption/demand elimination, reduction, and redirection, has become more common. For example, Boddewyn and Doh (2011) focus on the growing phenomenon of collaborative arrangements between multinational enterprises, nongovernmental organizations, and governments in emerging markets for the provisioning of local public goods essential for the multinational enterprises' commercial operations. In addition, as summarized in Table 1, working with governments to promote sustainable development in the countries where they operate is among the sustainability-related strategic priorities of MNCs.

Implications for Global Social Innovations for Base-of-the-Pyramid Markets

> In 2004, Hindustan Unilever Limited (HUL), the Indian unit of the Unilever Group, introduced Pureit brand water purifier (an in-home, point-of-use water purifier). Priced at the equivalent of US$44, HUL viewed its Classic model of Pureit brand water purifier as a breakthrough innovation that offered the gold standard of water safety at a price point that millions of consumers in India who lacked access to clean drinking water could afford. Rather than employing a cost-based pricing strategy, with the objective of achieving a leadership position in the targeted consumer segments, HUL employed a strategy of pricing the product at a cost the targeted consumer segments could afford. Following the successful launch of Pureit brand water purifier in India, Unilever made plans to launch the product globally in several countries in Latin America, Africa, and southeast Asia. In 2009, the Tata Group, an Indian conglomerate,

introduced its Swach (meaning "clean") brand water purifier in India at a price equivalent to US$22, coupled with an announcement of its plans to launch an even less expensive model (at a price equivalent to US$16) in the future (see Rangan and Sinha 2011).

WaterHealth India uses an innovative business model to provide scalable, safe, and affordable water solutions to people who lack access to clean water. Its WaterHealth Centers are community water systems that offer consumers at the base of the market pyramid purified water at a small fraction of the price of bottled water. A typical WaterHealth Center takes approximately 20 days to set up and is designed to provide 20 liters of water each day, per person, for a community of 3,000 people. To finance the installation of the water centers, WaterHealth India draws capital investments from the government and private sponsors. Sponsors pay for a portion of the installation cost up front, and WaterHealth India covers the rest of the necessary capital expenditures. The fee that end users pay (based on the amount of water they consume) is used to cover WaterHealth India's financing costs, as well as for ongoing maintenance of the WaterHealth Centers (see Borgonovi et al. 2011; India Knowledge@Wharton 2012).

As these vignettes highlight, significant quantity and quality gaps in public goods in emerging and less developed markets have been an impetus for MNCs, social enterprises, and other types of organizations to innovate for the primary benefit of consumers at the base of the market pyramid. The first vignette is illustrative of innovations in the realm of private goods that are complements to public goods characterized by quantity and quality gaps. The second vignette is illustrative of innovations in the realm of private goods that are substitutes for public goods characterized by quantity and quality gaps.

Along the lines of the conceptualization of global public goods in previous literature (Kaul, Grunberg, and Stern 1999), and given the potential of innovations such as those highlighted in the previous vignettes to benefit customers at the base of the market pyramid across the world, the term "global social innovations" can be viewed as aptly capturing their essence. As innovations that deliver social benefits and business value, they are also consistent with Pfitzer, Bockstette, and Stamp's (2013) construal of "innovating for shared value." The organizational mindset underlying the focus on such innovations is similar to Porter and Kramer's (2011) conceptualization of "shared value" as the policies and practices of a firm that enhance both its competitiveness and the economic and social conditions in the communities in which it operates.

Pfitzer, Bockstette, and Stamp (2013) note that firms that excel in innovating for shared value rely on five mutually reinforcing elements: (1) embedding a social purpose in their mission, (2) defining the social need, (3) measuring shared value, (4) creating the optimal innovation structure, and (5) cocreating with external stakeholders. Kolk and Pinkse (2008) characterize climate change as an environmental issue that offers MNCs an opportunity to develop green firm-specific advantages. In a similar vein, it may be meaningful for MNCs to view market opportunities for developing base of the market pyramid–focused innovations in the face of quantity and quality gaps in public goods in emerging and less developed markets as opportunities for developing global social innovation capabilities.

In the broader context of innovating for the base of the market pyramid, it has been pointed out that, as opposed to the traditional "Cost + Profit = Price" mindset, innovations should be pursued with a "Price – Profit = Cost" mindset. That is, the price that customers comprising the base of the market pyramid can afford to pay specifies the upper limit for the unit cost of the product innovation. Furthermore, some have noted that new business models may need to be employed in light of the importance of scalability, high volume, and low profit margin to the profitability of base of market pyramid–focused innovations. For example, rather than being borne by one firm, the capital intensity of the business can be lowered by businesses spreading the capital requirements for fixed assets and working capital over the ecosystem (see Prahalad 2012). The example relating to WaterHealth India presented at the beginning of this section serves to illustrate this innovation mindset being put to practice. By virtue of the emphasis on lowering costs (i.e., "Price – Profit = Cost"), base of the market pyramid–focused innovations also tend to be sustainability oriented (e.g., greater emphasis on efficiency in the use of various renewable and nonrenewable resources).

In addition to literature on base-of-the-pyramid markets, literature on social embeddedness and social entrepreneurship also provide insights into successfully and profitably innovating for base of the market pyramid customers. For example, London and Hart (2004)

note that, in addition to global efficiency (leveraging knowledge and resources), national responsiveness (modifying knowledge and resources), and worldwide learning (sharing knowledge and resources)—all posited in the transnational model as capabilities crucial to the success of MNCs (Bartlett and Ghoshal 1989)—social embeddedness is a fourth global capability crucial to the success of MNCs in base-of-the-pyramid markets. London and Hart (2004, p. 364) define "social embeddedness" as "the ability to create competitive advantage based on a deep understanding of and integration with the local environment." According to the authors, social embeddedness as an organizational capability involves the ability to create a web of connections with a diversity of organizations and institutions; generate bottom-up development; and understand, leverage, and build on the existing social infrastructure.

Austin et al. (2006, pp. 169–70) define "social entrepreneurship" as "achieving greater social impact through innovation and adaptation of the discipline and tools from the business world in support of a social mission" and "corporate social entrepreneurship" as "the process of extending the firm's domain of competence and corresponding opportunity set through innovative leveraging of resources, both within and outside its direct control, aimed at the simultaneous creation of economic and social value." They list three strategic elements as key to corporate social entrepreneurship: (1) alignment between the social dimensions and business dimensions of a firm's strategy, (2) leveraging a firm's core competencies, and (3) partnering to gain access to new and different resources and competencies.

Implications for Demarketing of IZD, ILD, and EMHS Products

The current and projected size of the market for various private IZD, ILD, and EMHS products in individual country markets and at the global level (e.g., the size of the market for bottled water in North America, Western Europe, and China combined is projected to be approximately $63 billion by 2017; see Doherty 2013), and the deep inroads that for-profit firms have made into these product-markets (e.g., Nestlé owns more than 60 bottled water brands; see Doherty 2013) are indicative of such products' growing importance for these firms. These considerations suggest that even in a scenario of basic public goods being available in adequate quantity and of acceptable quality, producers of substitute private goods (i.e., IZD, ILD, and EMHS products) are likely to devote considerable resources toward promoting consumption of their product offerings (e.g., bottled water, flavored bottled water, vitamin-enriched bottled water) as an alternative to the substitute public good (tap water). Thus, following the bridging of quantity and quality gaps in various public goods through public policy actions, there may be a need for public policy efforts directed toward the demarketing (see Kotler and Levy 1971) of private substitute goods. The demarketing task in the context of IZD, ILD, and EMHS products is to achieve sustainability-oriented changes in consumers' behaviors by shaping and influencing their sustainability-related attitudes, beliefs, concerns, knowledge, and values.

Sustainability-oriented demarketing is defined herein as the use of marketing concepts, tools, and techniques to mitigate the environmental impact of the general public's consumption-related behaviors by promoting (1) cessation of consumption of certain products, (2) reduction in consumption of certain other products, and (3) redirection of consumption from still other EMHS products to ELHS products. Given the twin tasks of promotion of cessation of an IZD product (or reduction in consumption of an ILD product, or redirection of consumption away from an EMHS product), and the concurrent promotion of consumption of the substitute public good in its place, "comparative demarketing" and "stealth demarketing" can be viewed as potential alternative approaches. Comparative demarketing is defined as the use of marketing tools and techniques to achieve desired changes in consumers' attitudes and behaviors by highlighting the negative sustainability consequences of a specific IZD, ILD, or EMHS product and the positive sustainability benefits of the substitute public good. Stealth demarketing is defined as the use of marketing tools and techniques to achieve desired changes in consumers' attitudes and behaviors by highlighting the positive sustainability benefits of the substitute public good without making explicit reference to the private good that is the target of demarketing. The following examples illustrate the distinction.

Comparative Demarketing:

- Don't drive. Make it a habit to take the mass transit to work. It is reliable, fast, inexpensive and eco-friendly.

- Don't waste precious money on bottled water. Make it a habit to drink tap water. It's safe, free, and eco-friendly.

Stealth Demarketing:

- Make it a habit to take the mass transit to work. It is reliable, fast, inexpensive, and eco-friendly.

- Make it a habit to drink tap water. It's safe, free, and eco-friendly.

These examples are intended to be illustrative of message content rather than the message framing. Furthermore, even the message content may not be sufficiently nuanced. For example, although encouraging a larger percentage of the population to use mass transit to a greater extent can enhance sustainability in the long run, some section of the population with special needs may not be able to do so.

Extant literature in marketing provides valuable insights into the relative efficacy of alternative framings of appeals to foster consumption elimination, reduction, and/or redirection behaviors in consumers. This body of literature can also be insightful in the context of demarketing IZD, ILD, and EMHS products. For example, Goldstein, Cialdini, and Griskevicius (2008) investigate the relative effectiveness of appeals that use descriptive norms versus appeals solely focused on environmental conservation to promote consumption reduction in a service setting (motivating customers to reuse towels while staying at hotels). They report that appeals using descriptive norms are more effective in motivating consumers to engage in proenvironmental behaviors than appeals solely focused on environmental conservation. They further note that normative appeals that describe group behaviors occurring in a setting that closely matches people's immediate situational circumstances are most effective. White and Simpson (2013) investigate the relative effectiveness of injunctive appeals (highlighting what others think one should do), descriptive appeals (highlighting what others are doing), and benefit appeals (highlighting the benefits of the action) to promote consumption elimination in the context of a service provided by the city government (motivating households to leave grass clippings on their lawns [grasscycling] as opposed to bagging them for curbside pickup to send to landfill). Kronorod, Grinstein, and Wathieu (2012) explore the relative effectiveness of assertive versus nonassertive message phrasing to promote consumption reduction of a private good and a public good (soap and water, respectively) and consumption redirection from a private good to a public good (from private to public transportation). In their study, Grinstein and Nisan (2009) use the term "pro-environmental demarketing" to refer to the marketing efforts of a government agency to promote consumption reduction of a public good (i.e., water).

Directions for Further Research

In recent years, several case studies on innovations for the base of the market pyramid in response to quantity and quality gaps in public goods have been published (Kennedy, Jorasch, and Sorensen 2012; Mukherji and Jose 2010; Rangan and Sinha 2011). A potential avenue for further research involves building theories from case-based research. Such case-based research can shed light on organizational and environmental antecedents of firm propensity or predisposition toward base of the market pyramid–focused innovations in response to quantity and quality gaps in public goods. Eisenhardt (1989) outlines the process for building theories using case studies. Following an analysis of case studies on the successful and failed strategies of MNCs in serving consumers in the base of the market pyramid in emerging markets, London and Hart (2004) identify social embeddedness as an organizational capability crucial for success in emerging markets.

Previous sections and the Appendix present several products illustrative of IZD, ILD, and EMHS products. However, these illustrative products constitute only a small subset of the larger population of each of type of product. A potential avenue for further research is the systematic identification of the larger population of private substitute goods (IZD, ILD, and EMHS products) that evidence abnormal demand due to quantity and quality gaps in various public goods in specific country markets. A related potential avenue for further research is estimation of the negative sustainability effects of abnormal demand of specific IZD, ILD, and EMHS products in specific country markets and the potential positive sustainability effects that can be realized through elimination of quantity and quality gaps in specific public goods. Another worthwhile line of inquiry in the context of demarketing IZD, ILD, and EMHS products is to explore the contingencies under which comparative demarketing may be more effective than stealth demarketing, and vice versa.

CONCLUSION

The achievement of sustainability-related goals by individual nations (e.g., reductions in greenhouse gas emis-

sions, energy intensity per unit of gross domestic product [GDP], water intensity per unit of GDP) calls for the pursuit of a portfolio of sustainability initiatives. In this context, this article highlights the role of public policy actions for creating macro-environmental market conditions that may be conducive to the elimination of consumption of a class of products (IZD products), reduction in consumption of a second class of products (ILD products), and redirection of consumption of a third class of products (EMHS products) to ELHS products. Table 2 provides a summary of the implications for public policy in the realms of demand management (alleviating quantity and quality gaps in public goods) and demarketing (in the aftermath of alleviation of quantity and quality gaps in public goods).

In emerging and less developed markets in particular, investments in infrastructure are crucial from the standpoint of not only potential economic benefits but also social and sustainability benefits. For example, in reference to economic benefits, a McKinsey Global Institute report (Dobbs et al. 2013) notes that an increase in infrastructure investment equivalent to 1% of India's GDP has the potential to create 3.4 million additional direct and indirect jobs in India. In reference to socioeconomic benefits of investment in infrastructure, Kana-

Table 2. Toward Sustainability: Product Type, Demand Management Task, and Demarketing Task

Product Type	Demand Management Task at the Macro Level[a]	Demarketing Task[b]	Demarketing Example
IZD product: A private substitute or a private complementary good for a public good that would have zero demand in a product market in the absence of quantity and quality gaps in the public good and positive demand under conditions of prevalence of quantity and quality gaps in the public good.	Demand elimination through creation of macro-environmental conditions conducive for consumption elimination of IZD products	Consumption elimination of private IZD good and redirection of consumption to substitute collective good	Elimination of demand for captive electric power generators in factories and commercial establishments and electric power storage devices in households and redirection of demand to electric power generated by public utilities
ILD product: A private substitute good for a public good that would have a lower level of demand in a product-market in the absence of quantity and quality gaps in the public good, compared with the level of demand that will prevail under conditions of prevalence of quantity and quality gaps in the public good.	Demand reduction through creation of macro-environmental conditions conducive for consumption reduction of ILD products	Consumption reduction of private ILD good and redirection of consumption to substitute collective good	Reduction in consumption of bottled water and redirection of consumption to safe to drink tap water
EMHS product: A private good whose environmental impact through its life cycle is greater than a public good or a private good for which it is a substitute.	Demand redirection from EMHS products to EMLS products through creation of macro environmental conditions conducive for consumption redirection from EMHS to EMLS products	Consumption redirection from an EMHS private good to an ELHS private good or an ELHS collective good	Redirection of demand from privately owned vehicles to public mass transit systems to commute to and from work

[a]Demand management at the level of the product category at large through public policy actions (investments in infrastructure) to bridge quantity and quality gaps in basic public goods.
[b]Even under macro-environmental conditions conducive to consumption elimination of IZD products, consumption reduction of ILD products, and consumption redirection from EMHS to ELHS products, in the face of competition from private substitute goods (IZD, ILD, and EMHS products), there will be a need for demarketing to wean consumers from these products and encourage use of substitute public goods.

gawa and Nakata (2008) report that increased electrification of rural areas in developing countries leads to significant improvements in literacy rates. Relative to the body of knowledge on the economic and social benefits of investment in infrastructure, there is a dearth of research on the potential sustainability benefits of investments in infrastructure and the adverse sustainability consequences of deficient infrastructure. The issues addressed in this article also contribute toward filling this void.

APPENDIX: DEMAND EFFECTS OF QUANTITY GAPS AND QUALITY GAPS IN PUBLIC GOODS

This Appendix provides an exploration of abnormal demand for various IZD, ILD, and EMHS products due to quantity and quality gaps in specific public goods.

Public Good: Electric Power Supply

- Quantity Gap: Intermittent power supply
- Quality Gap: Severe voltage fluctuations

Quantity Gap–Driven Demand Effects
B2B Market Space:
- Demand for backup power generators at factories, offices, retail outlets, restaurants, movie theaters, and so on.
- Demand for portable power supply services, such as portable power generators fitted on vehicles that are driven and connected to commercial establishments in specific zones of a city that are disconnected from the power grid during scheduled times.

B2C Market Space:
- Demand for backup power supply systems (power inverters) in households

Quality Gap–Driven Demand Effects
- Demand for voltage stabilizers and surge protectors to prevent damage to equipment (B2B market) and appliances and home entertainment devices (B2C market) due to severe voltage fluctuations

Public Good: Sanitation Services

- Quality Gap: Stagnant pools of water, poor drainage, and open sewage pools (breeding grounds for mosquitoes)

Quality Gap–Driven Demand Effects
- Mosquito repellents
- Mosquito nets
- Wire mesh for windows
- Physician services, health care–related lab services, and medicine in the aftermath of illness (malaria) following mosquito bites

Public Good: Mass Transit Service

- Quantity Gap: Overcrowded buses and trains
- Quality Gap: Unreliable schedules

Quantity Gap– and Quality Gap–Driven Demand Effects
- Demand for private (personal) transportation vehicles (two wheelers and four wheelers)
- Demand for physician services in the aftermath of inhalation of highly polluted air with a higher level of emissions due to more people commuting using personal transportation systems (an EMHS product) as opposed to public transportation systems (an ELHS product)

Public Good: Road Network

- Quantity Gap: Overcrowded roads
- Quality Gap: Poorly maintained roads (e.g., potholes on roads)

Quality Gap–Driven Demand Effects
Poorly maintained roads (potholes on roads) stimulating a larger replacement market for certain automotive parts and automobile maintenance services than would be the case under conditions of normal wear and tear.

Increased Demand for Goods
- Replacement market for tires, shock absorbers, and other automotive parts affected by poor road conditions

Increased Demand for Services
- Tire retreading
- Installation of shock absorbers and other damaged automotive parts

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