Perspectives on Sustainable Growth

Daniel R. Cahoy
Jamison E. Colburn *Editors*

Law and the Transition to Business Sustainability

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Perspectives on Sustainable Growth

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Preface

The contours of "sustainability" as it is being pushed by regulators and pulled by markets are beginning to sharpen in focus. The notion of "sustainability" has always had a tricky way of obscuring the hard questions like who or what is to be sustained, for what reason(s), and for how long. The broader the sustainability wave has grown, the more insistent the questions have grown. Yet, as Professor Malloy observes in Chap. 1, the term's use in the legal literature has remained almost haphazard. Part of our aim in convening the conference which lay behind this volume was to do a kind of fitness check of sustainability as a regulatory program and as a set of corporate practices. But our deeper ambition was to assemble a team of people handling the beast in different quarters and with different tools—some not even explicitly or expressly concerned with "sustainability" as such—so as to tease out some commonalities of inquiry and insight in this fast evolving field. What we discovered is that the distributed nature of legal authority in the modern, multi-agency state has made corporate and regulatory sustainability practices highly contextualized, adaptive, and yet still subject to some troubling failures and shortcomings.

If we assume a standard definition of sustainability—the present's fulfillment of its needs without compromising the future's capacities to do so for itself—the net to be cast in search of relevant corporate and regulatory actions is immense. Sustainability advocates have long noted several incompatibilities between the means and ends of sustainability within the modern, multinational firm and the traditional tools that command-and-control regulators wield. A single regulator cannot possibly stay current in all of the constantly improving knowledge domains needed to pursue "sustainability," even to a first approximation. Regulators, at least in the USA and EU, are possessed of jurisdictional authority stemming from legislation of limited scope, often limited to particular resources. (Turning an air pollution problem into a land or water pollution problem with a stringent permit is a ballyhooed form of regulatory failure.) Regulators, even those who seek only to push new technologies into a malfunctioning market for environmental controls, often lack the resources to improve their own standards in step with improving knowledge, engineering, and/or markets. They cannot improve continuously because they are radically under-funded. So they inadvertently lock in the antiquated standards of yesterday. Finally, regulators that

act out of "precaution" and always err on the side of controls rather than risk may simply push business elsewhere, "leaking" into other jurisdictions less inclined to regulate with the conventional tools. Thus has "sustainability" so long gravitated toward certain less conventional tools and practices.

So what are sustainability's preferred tools? As Professor Malloy argues, "sustainable production" takes the long view of a product or service, factoring its whole life cycle into the balance. So-called "cradle-to-cradle" thinking has certainly gained a measure of acceptance in the board room and with regulators globally. But sustainable production seeks to serve economic, social, and environmental ends equally and to anticipate and prevent adverse impacts in any of these three dimensions. So its tools must be adaptive and continuously improving. Governments have experimented with a wide variety of inducements toward sustainable production. These have included, as Professor Prum discusses in Chap. 2, the conscious use of governmental purchasing power. The US Government, interested to improve the performance of buildings and construction in their uses of water, energy, toxic materials, and space created its own Federal Green Construction Guide for Specifiers (FGCGS), a guidance to those officials specifying demands for contractors who build or rehabilitate federal buildings. But its FGCGS put the Office of the Federal Environmental Executive into a sphere of competitors already seeking to push green building ahead in their own ways. That sphere includes private nonprofits like the US Green Building Council (USGBC) and International Code Council, state governments like California and New York, and hundreds of local governments experimenting with their own means. Tools like the FGCGS do not mandate technology improvements so much as they incentivize it by setting the terms and conditions under which a major market actor will do business.

Beyond production related to building and construction, government inducement of cradle-to-cradle thinking is also strongly applied in the context of goods that produce harmful waste when disposed. For example, Professor Atasu describes the push to address consumer waste from electronics goods in Chap. 3. These wastes often contain lead, mercury, hexavalent chromium, and other toxins. Regulators have long understood that consumer incentives to responsibly recycle such harmful wastes are insufficient to ameliorate their environmental impact. So legislators instead push the concept of "extended producer responsibility." Laws enacted under this philosophy shift the burden of hazardous obsolescence to manufacturers by imposing costs for failing to take back products after consumers have finished. Professor Atasu utilizes an operations approach to analyze several state-level laws and provides a set of principles that legislators can use to guide their efforts. Importantly, Professor Atasu warns that take back legislation that is poorly designed from an operational standpoint can lead to negative externalities in terms of product design, nature, and firm competition.

Still other tools in common use include direct and indirect subsidies. As Professor Bloom argues in Chap. 4, with this tool comes several unique challenges. Subsidies to firms encouraging their adoption of sustainable production methods can, when designed well, push those firms in ways similar to command-and-control regulations. Because subsidies are voluntary with the participating firm, though, unless they give

some market advantage to their takers, they may do little to pull overall improvement. In short, subsidies run the risk of effectuating too little real change. Another risk for subsidies, as Professor Bloom argues in her study of Wal-Mart's shift to local sourcing in its grocery business, is their being commandeered by the most powerful market actors in ways too subtle or complex to be noticed by a broader public. Given its unrivaled size and sophistication, Wal-Mart has been able literally to bend the collective understanding of sustainability toward its own supply chain efficiency in its multinational grocery business. Professor Bloom questions whether subsidies that began in the pursuit of sustainability have accomplished much more than enhancing Wal-Mart's bottom line.

Because technological innovation has never been optimally distributed, the public interest in sustainability may well justify the aggressive pursuit of technology transfer. But barriers related to intellectual property can often prevent transfer to the populations that need sustainability's technology most. Conditions may be exacerbated when firms in developed countries hold technology, but interested firms and consumers are located in developing nations. Thus, an emerging tool for supporting global sustainability is to create an incentive-aligned structure for technology licensing. Dr. van der Veen and Prof. Ossewijer make the case for an international technology exchange in Chap. 5. They describe how such an entity can be created and supported through existing commitments under the United Nations Framework Convention on Climate Change. The system they propose envisions currencies of global sustainability support that are more business-oriented than naked cash donations. Van der Veen and Ossewijer argue that a properly constructed exchange benefits both business and vulnerable populations, creating a win–win in terms of profits and social responsibility.

Likewise, Mr. Joachim Monkelbaan reminds us in Chap. 6 of what a level playing field could do to support the global development of sustainable alternatives to existing products and services like energy. Monkelbaan considers the trade in sustainable energy and how today's polarizing environment fuels concerns over protectionism, unfair competition, and higher prices. He describes the need for a "sustainable energy trade agreement" (SETA) as a mechanism for ensuring that trade barriers are as low as possible, supporting fast adoption. Monkelbaan makes clear that such agreements are in the interest of businesses, and points to strong support from groups like the "Business-20" (B-20). The role of international trade organizations in supporting the transition to business sustainability is often overlooked, but their impact can be substantial.

In the last analysis, corporate practices themselves have constituted the lifeblood of sustainability—the so-called self-regulation tools of "best practices," "codes of conduct," annual reports, and the like. Some of this involves third-party auditing and other forms of transparency and accountability. Some of it is comfortably entrenched in the recesses of corporate governance where "business judgment" trumps environmental and social costs unless and until the latter find some form of expression in the firm's profitability. Corporate sustainability reporting has continued to evolve since it emerged around the turn of the century. As Professor Hess reports in Chap. 7, over 80 % of the Global Fortune 250 firms now generate such a report. Many if not

most of these reports disclose information in selective and strategic ways, avoid real stakeholder engagement for the safety of reputation and risk management goals, and remain firmly decoupled from the corporation's strategic and operational decision making. "New governance" scholars convinced of the quasi-regulatory effects of disclosure would do well to understand the corruption of tools like corporate self-reporting, to be sure. They should expect to see lower quality disclosures wherever knowledgeable stakeholders can use the information to criticize the firm's performance or demand changes. Indeed, as Professor Hess observes in Chap. 7, much of that has been born out in practice. If it is true, as others have found, that transparency and disclosure are likely to work when the information they create can be easily taken up into users' routines and when disclosers, in turn, embed the users' altered choices in their own decision making in ways that advance the public good, corporate sustainability reporting may face a rather acute need for externally imposed quality controls. Various intermediaries have moved to provide them, but they face the same hurdles a regulator would and lack the power to coerce regulated parties in any event.

While dissembling is one thing, Professor Lane discusses in Chap. 8 incidents of outright fraud and deception cloaked in a layer of green. He explains that the recent explosion of clean technology on a business-to-business (B-to-B) scale has led—perhaps inevitably—to incidents of B-to-B "greenwashing." Professor Lane notes that the existing greenwashing paradigm is so attuned to consumer harm that it may fail to capture this expanded impact. He proposes an identification system partially operationalized with matrices that can help regulators and policy makers identify true greenwashing. In the absence of such perspective, those seeking to profit from misdirection and misleading information may thwart the adoption of sustainable solutions on a business scale.

This returns us to the commonalities that emerged from our chapter authors and their research. Efforts to envision, operationalize, and actually to achieve some form of "sustainability" inevitably confront the same challenges that frustrated traditional, command-and-control methods decades ago. They confront them in different forms and with different horizons in mind, perhaps, but they confront them all the same. The same contextualization and continuous adaptation that eventually came to characterize regulatory practice—albeit in slower, more litigious, and more constrained ways—is beginning to characterize corporate and governmental sustainability programs as well. Those working to integrate sustainability's three dimensions will find an incredible array of context-specific solutions in circulation today, many of which are plausibly adapted to other contexts, jurisdictions, and/or problems. But there is a cautionary note to be sounded. Borrowing highly adapted tools without full knowledge of their limitations and/or usefulness can be a recipe for failure. Professor Malloy's comparison of different regulators' approaches finds that each is strong on some dimension of sustainability but that none is strong on all—no single program has managed to integrate all three elements' pursuit.

Not all is lost, of course. In the multi-agency, federated state, tool choices tend to be highly interactive: what one actor does often influences others, sometimes quite powerfully. For example, as Professor Prum shows in his analysis of several local

and state green building programs, careful attention to pertinent federal statutes defining efficiency levels for major home appliances is needed if they are to avoid being preempted by the operation of federal law under the US Constitution. With such care and diligence, however, local and state jurisdictions are likely to learn something about high performance in particular business sectors and what further improvements might still be incentivized (if not necessarily mandated). Federal tools like the FGCGS can alleviate information burdens on such local and state jurisdictions if only they know to borrow that expertise when the time is right. The loose partnering that such interaction represents could, in turn, benefit the federal government as well. The more particularized technologies are adopted, the better our understanding of their performance in real-time applications, under diverse circumstances, and the more confidence we may have in them. The Office of the Federal Environmental Executive, thus, would do well to facilitate this kind of borrowing, to record it, and to communicate any insights it might have into how such networking has ratcheted expectations upward.

For their parts, American courts have seemed alert to this kind of intricate federal-state-local-private looping. Professor Prum highlights two preemption cases hearing industry challenges to local green building codes and notes the sensitive scrutiny the courts gave in seeking to accommodate the different interests involved under conditions of ostensible conflict. Perhaps what "sustainability" needs most from corporate practices and the diversity of jurisdictional authorities pushing them to evolve further and faster is an explicit doctrinal synthesis facilitating accurate tool choice, full transparency about trade-offs between sustainability's three dimensions, and the proper incentives for everyone to remain adaptive and constantly seeking improvement. If so, our courts are probably many years away from that achievement. But the incremental reconciliation of careful attempts by different actors, informed judgments on the basis of the best available information, and sustained efforts to collaborate across boundaries will almost certainly keep us pointed in that direction.

University Park, PA, USA — Daniel R. Cahoy
March 2014 — Jamison E. Colburn

Contents

Chapter 1
Design for Regulation: Integrating Sustainable Production into Mainstream Regulation

Timothy F. Malloy

Abstract This chapter asks what is needed to craft effective legal frameworks that take the notion of sustainable production seriously. Getting to an answer requires consideration of three questions. First, what do we mean by "sustainable production" in terms of a definition and fundamental principles? Here the chapter adopts a definition and examines three central principles: life cycle thinking, integration of environmental, social and economic concerns, and a preventive orientation. Second, what types of mandatory regulation can be used to advance sustainable production in accord with the fundamental principles? In response the chapter provides an overview of forms of sustainability-based regulation, and maps them onto five existing regulatory programs that to various degrees reflect sustainable production concepts. Third, which of those forms of regulation should be used to advance sustainable production? Recognizing the breadth of this normative question, the chapter does not attempt to identify the optimal regulatory approach. Instead it offers a set of factors that may influence regulatory design in this context.

1.1 Introduction

"Sustainability …" the term is used almost haphazardly in the legal literature. Most articles assume a common yet unstated understanding of the term, and focus upon governance frameworks and policy tools intended to advance sustainability and sustainable production in various industry sectors (Dernbach, 2002; Salzman, 1997; Sax, 2011). In contrast, the scientific and business management literature tends to explicitly operationalize sustainable production and its close cousin sustainable consumption. That literature largely studies methods of measuring and evaluating

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the sustainability of products and production processes, as well as tools and systems for assimilating sustainability into business (Bovea & Perez-Belis, 2012). Yet it gives little attention to the role that law could play in advancing sustainable production. This chapter aims to engage the law, science and business of sustainable production, asking what it would take to make the concept central to governance.

The chapter proceeds in three parts. The first part sets the stage, beginning with an introduction to sustainable production in terms of a definition and its central principles. The second part reviews five existing regulatory programs that to various degrees reflect sustainable production concepts. It organizes those programs along two regulatory features—Mode of Influence and Locus of Control—and evaluates them against the sustainable production definition and principles. Drawing upon that review, the third part offers a set of factors to be considered in designing sustainability-based regulation.

1.2 Setting Boundaries: Sustainable Production and the Regulatory Setting

Like happiness and love, sustainability means many things to many people (Solow, 1993).[1] The concept of sustainable development as such has been on the scene since at least 1987 when the World Commission on Environment and Development published the Brundtland Report (World Commission on Environment and Development, 1987).[2] The Commission defined sustainable development as "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). While recognizing that economic growth was central to reducing poverty and addressing living conditions globally, the Commission stressed that economic development must be integrated with social development and environmental protection (Lehtonen, 2004; World Commission on Environment and Development, 1987). The Commission identified industrial production as one area of concern (World Commission on Environment and Development, 1987) and 5 years later the United Nations Conference on Environment and Development made the case for sustainable production and consumption as an essential part of sustainable development (UNCED, 1992a, 1992b). In the decades since, focus on sustainable production and consumption has continued at the international and domestic government level, and among businesses, academics and non-governmental organizations (EPA, 2009; ISO, 2002). Despite that interest, there has been little progress

[1] One commentator estimated that "three hundred definitions of 'sustainability' and 'sustainable development' exist broadly within the domain of environmental management and the associated disciplines" (Johnston, Everard, Santillo, & Robèrt, 2007).

[2] The Commission began meeting in 1984. Of course, researchers and stakeholders had raised concerns about unbridled economic development for years before the Commission coined the term "sustainable development" (O'Brien, 1999).

integrating notions of sustainable production into regulatory programs, particularly in the United States (Gabdenberger, Garrelts, &Wehlau, 2011; Tukker et al., 2008).

First things first—what do I mean by "sustainable production? Neither the Rio Declaration nor Agenda 21 defined the term; the academic literature offers a range of choices (Geldermann, 2007; Veleva & Ellenbecker, 2001). For purposes of this chapter, I rely upon the following definition (Quinn, 2001):

> Production systems that are non-polluting; conserving of energy and natural resources; economically viable; safe and healthful for employees, communities and consumers; and socially and creatively rewarding for employees.

This definition adequately captures the three dimensions of sustainable development—the economic, social and environmental—but situates them in the framework of industrial production.[3]

Some further articulation is required however, as the definition does not reflect three underlying principles present in the Rio Declaration, Agenda 21 and the literature spawned by them. First, sustainable production adopts a life cycle perspective, considering the impacts of production along the entire life of the product. This principle does not require adoption of formal life cycle analysis but rather calls for incorporation of a broad view of ways in which production affects the environmental, economic and social dimensions. Second, sustainable production does more than simply consider or acknowledge the three dimensions; it actively integrates them with one another. Such integration means that in any given situation, trade-offs among the three dimensions will often be required. Third, sustainable production seeks to "anticipate and prevent" adverse impacts on human health and ecological systems flowing from production. Conventional approaches attempt identify acceptable exposure levels and meet such levels through engineering or administrative controls. Sustainable production instead avoids or minimizes potential exposures through safer design of products and processes.

This chapter takes as given that production should strive for sustainability as defined above, and that the law is an appropriate vehicle for pursuing that end. What would policy that takes sustainable production seriously look like? Clearly there are a range of policy tools available to advance sustainable production; technology policy creating incentives and demand for sustainable production processes and products, educational policy that builds intellectual capacity and know how, and so on. Likewise, soft law approaches abound, most notably sustainability indicators and sustainability certification programs. In considering that question, however, I focus on what I call "mainstream regulation" or "hard law"—mandatory programs of general application administered by government regulators. Sustainability has in large part remained in the periphery of mainstream regulation, and the sustainability literature has yet to systematically address the role of mainstream regulation. This gap is worth filling, particularly given the emergence of new regulatory programs that begin to take on issues of sustainable production.

[3] Admittedly, the definition does not incorporate the concept of sustainable consumption, which is often paired with sustainable production.

Before turning to the structure of the regulation, however, a brief diversion regarding the concept of sustainability analysis is in order. The shift from conventional regulation to sustainability-based regulation fundamentally affects the methodologies relied upon in establishing regulatory standards. Generally speaking, conventional regulation uses risk assessment to set health-based acceptable exposure levels, or technology assessment of various forms to identify best available control technologies. Neither these methodologies, nor the performance standards derived from them, directly impact product or process design in the vast majority of cases. As we shall see, regulation seeking to advance sustainable production reaches within the product design process and the manufacturing process itself, directly influencing or even prescribing choices. This calls for sustainability analysis, a different methodology which operationalizes the concept of sustainable production.[4] It involves the identification and evaluation of viable, sustainable product and process designs. The evaluation includes a range of criteria, including human health and ecological impacts, technical feasibility, and economic and social concerns relevant to sustainability.

A variety of methods already exist that could be adapted for use in a sustainability-based regulatory program. Some are used by businesses, others by government agencies within and outside the regulatory process, still others are offered by academics in the literature. The landscape is vast; sustainable production pulls in numerous disciplines, including business, design, engineering, and environmental policy (Baumann, Boons, & Bragd, 2002). Depending upon the disciplinary and experiential perspective, any particular method may focus upon different aspects of production such as product design, production processes, and supply chain management (Ramani et al., 2010). Accordingly, there are a broad range of methodologies and tools in play, representing a variety of foci, approaches and disciplinary underpinnings. The discussion that follows assumes that an appropriate sustainability analysis method will be available to policymakers and regulated firms as part of sustainability-based regulation.

1.3 Features of Mainstream Regulation

Many types of regulation exist within the broad umbrella of mainstream regulation, including performance standards, permitting/registration regimes, information disclosure programs, and environmental taxes to name a few. To bring some order and tractability to the analysis, I organize the types of mainstream regulation along two features: Mode of Influence and Locus of Control. There are other features across which regulatory approaches can and have been organized. As will become apparent, these two are particularly relevant in discussing nascent forms of sustainability-based regulation. This part describes the two features, and maps five regulatory programs relevant to sustainable production against them.

[4] I use the term "sustainability analysis" with some trepidation given the disparate meanings ascribed to it. *See* Hacking and Guthrie (2008). That said, we have to call it something.

Mode of Influence Mode of Influence refers to the mechanism by which the regulation influences behavior of the regulated entity. All regulation seeks to alter behavior, but not in the same way. In the context of sustainable production, the desired behavior is the adoption by business firms of sustainable practices in product design and manufacturing, consistent with the principles of life cycle thinking, integration, and prevention. For our purposes there are three such mechanisms: reflexive, prescriptive, and market.

The reflexive mechanism attempts to change behavior by forcing the regulated entity to critically examine the nature and consequences of its activities in light of societal norms and goals embedded in the regulation (Gunningham & Sinclair, 2009; Lynch-Wood & Williamson, 2011; Orts, 1995). Reflexive regulation is particularly effective where internal organizational barriers such as impaired communication or misaligned incentives prevent a corporation or other entity from implementing organizational or societal goals. The business management, economics and social science literature is filled with examples of the organizational and individual cognitive challenges facing firm managers and staff pursuing goals (Gilad, 2010). Requiring a regulated entity to engage in a sustainability analysis—to collect, process, and evaluate information about the sustainability of its products or processes—could overcome or at least mitigate such obstacles. It does so by making the firm more aware of its operations and self-critical of its performance (Malloy, 2003). It may also alert the firm of economically or strategically advantageous alternative product or process designs, even where the firm itself does not view sustainability as an important goal.

The prescriptive mechanism relies upon direct government intervention to change behavior, typically through performance standards identifying required outcomes such emission standards or discharge limitations. Less frequently, the prescriptive mechanism uses technology standards that specify particular control technologies or work practices (Bennear, 2006). As with the reflexive mechanism, the prescriptive mechanism would require a sustainability analysis. But it would go beyond the reflexive mechanism to actually mandate adoption of product and process designs that represent the optimal trade-off among the environmental, economic and social impacts. The prescriptive and reflexive mechanisms are not mutually exclusive; a program may require that a firm both engage in sustainability evaluation (the reflexive aspect) and subsequently adopt viable, more sustainable alternatives identified through that evaluation (the prescriptive aspect).

The market mechanism alters behavior by harnessing external actors and institutions and the pressure they bring to bear on the regulated entity (Cohen, 2001). This mechanism includes classic market-based mechanisms such environmental taxes which impose higher costs on firms that fail to adopt sustainable practices. Alternatively, the market mechanism enhances the capacity of interested third parties to identify and respond to the production practices of firms or industry sectors. Those responses may take the form of individual purchasing decisions or collective action such as social media campaigns, direct engagement, or stockholder activism (Lynch-Wood & Williamson, 2011). Information disclosure regimes such as right-to-know reporting and nutrition labeling are the most prominent examples of

this enhancement approach in conventional regulation.[5] Much has been written regarding the role of information disclosure as a market mechanism (Karkkainen, 2000–2001; Lyndon, 1989). This chapter will focus instead upon the prescriptive and reflexive mechanisms in the context of sustainable production.

Locus of Control Locus of Control refers to who controls the sustainability determination, including both the sustainability analysis and the ultimate decision regarding the final product or process design. The Locus of Control can be either firm-centric or agency-centric. In a firm-centric program, the regulated entity performs the sustainability analysis and selects the product or process design. That is not to say that the agency plays no role; it is after all the regulatory setting. But the government is not directly or consistently involved in the firm's decision-making process. Rather the agency's participation is limited to setting the rules of the game: establishing standards and guidelines for the sustainability analysis, auditing the firm's performance, and enforcing the outcome.

Not surprisingly, the agency-centric approach places control in the agency. In its strongest form, the agency itself performs the sustainability analysis and renders the final decision. A weaker version allows the regulated firm to perform the analysis, submitting it and a recommended decision to the agency. Despite the enhanced role of the firm, the agency retains the authority to require revisions to the analysis, or to perform its own. The agency also has the final say over the regulatory response. This weak form is often seen in conventional regulatory programs such as new source review permitting under the Clean Air Act and remedy selection under the Comprehensive Environmental Response, Compensation and Liability Act. In cases in which the agency relies upon the firm's analysis and recommendations without exercising its independent judgment, the agency-centric approach is transformed into a *de facto* firm-centric scenario.

Mode of Influence and Locus of Control are not completely independent. The nexus between the two lies in the reflexive mechanism's emphasis on engaging the internal management processes of the firm. That focus necessarily contemplates requires significant involvement by the firm in the sustainability analysis process. As the regulator asserts more and more control over the sustainability analysis (and thus intensifies the agency-centricity), the reflexivity of the regulatory program decreases. Increasing the firm-centricity has the opposite effect.

1.4 Nascent Forms of Sustainability Regulation

There are no existing regulatory programs that incorporate sustainable production in its fullest sense. That said, a number of programs in the United States and elsewhere do reflect principles of sustainable production and in some cases aspire to advance it. This section describes some of the most prominent and well developed

[5] It is worth noting that some commentators, including me, also identify information disclosure as a form of reflexive law (Karkkainen, 2000; Malloy, 2004).

programs, identifies their linkage to sustainability, and maps them against the two regulatory features, as summarized in Table 1.1.

Toxic Use Reduction Act The Massachusetts Toxic Use Reduction Act (TURA) requires that "large quantity toxics users" periodically complete a toxics use reduction plan for processes using or manufacturing a listed toxic substance (Massachusetts, 2006).[6] The plan, which must be certified by a state-approved planner, must include a comprehensive technical and economic evaluation of appropriate toxic use reduction options, and an implementation schedule for the options, if any, selected by the firm (Massachusetts, 2006). Toxics use reduction means "in-plant changes in production processes or raw materials that reduce, avoid, or eliminate the use of toxic or hazardous substances or generation of hazardous byproducts per unit of product, so as to reduce risks to the health of workers, consumers, or the environment" (Massachusetts, 2006). Relevant options include: input substitution, product reformulation, production unit redesign or modification, production unit modernization, improved operations and maintenance, and in-process recycling, reuse or extended use of production materials (Massachusetts, 2006).

TURA is the classic example of firm-centric, reflexive regulation. It does not require that firms adopt any toxics use reduction option, even if the plan demonstrates that the option is a safer, viable alternative (O'Rourke & Lee, 2004). Nor does the agency actively engage in preparation or review of the toxic use reduction plans; in fact firms are not even required to submit the plans to the agency in the normal course.[7] The regulations for the program reflect this reflexive focus. For example, plans must discuss how toxics use reduction affects the facility's policy or decisions regarding research and development, financial and capital investments, and personnel compensation and practices (MDEP). In terms of underlying principles, TURA does not affirmatively adopt broad life cycle thinking, focusing mostly on the use of toxics in production, and generation of toxic byproducts. Integration of the environmental, economic and social is thus largely lacking. Toxic use reduction planning looks primarily at environmental concerns, and considers economic effects in the narrow sense of impacts of alternatives on the firm rather than society more broadly. The program is quite strong on risk prevention, as its name suggests.

Contra Costa County Industrial Safety Ordinance Like TURA, the Contra Costa County Industrial Safety Ordinance (the "ISO") imposes planning obligations regarding the manufacturing process—in this case petroleum refining and certain types of chemical production (CCHMP, 2004; Contra Costa County, 2006). The County Supervisors enacted the ordinance in 1998 in response to several serious industrial accidents in this Northern California county. The ISO expands upon

[6] Large quantity toxics user are firms within specified industry sectors that use listed toxic substances above certain volumes and that employ ten or more full-time workers, unless the firms fall with a limited set of priority user segments (Massachusetts, 2006).

[7] In certain circumstances, the Massachusetts Department of Environmental Protection may establish performance standards applicable to industry segments limiting the generation of byproducts per unit of production (Massachusetts, 2006). The agency has yet to assert that authority some 24 years after TURA was enacted.

Table 1.1 Overview of sustainability-related regulatory programs

Program	Fit with sustainable production definition	Regulatory features		Sustainable production principles		
		Mode of influence	Locus of control	Life cycle thinking	Integration (trade-offs) among relevant dimensions	Risk prevention focus
Toxic Use Reduction Act (TURA)	Strong focus on pollution reduction and protection of workers, consumers and communities; weak focus on resources; no focus on social/creative impacts on workers	Reflexive	Firm-centric	No	No	Yes
Contra Costa County Industrial Safety Ordinance	Strong focus on protection of workers and communities; no focus on consumers; no focus on resources; no focus on social/creative impacts on workers	Prescriptive/reflexive	Firm-centric	No	No	Yes
European Union REACH Regulation/ Authorisation	Moderate focus on pollution reduction and protection of workers, consumers and communities; no focus on resources; no focus on social/creative impacts on workers	Prescriptive/reflexive	Agency-centric	Yes	Limited	No
CA Safer Consumer Products Regulations	Strong focus on pollution reduction and protection of workers, consumers and communities; strong focus on resources; no focus on social/creative impacts on workers	Prescriptive/reflexive	Agency-centric	Yes	Limited	Yes
European Union Ecodesign Directive	Moderate focus on pollution reduction; limited focus on protection of workers, consumers and communities; strong focus on resources; no focus on social/creative impacts on workers	Prescriptive	Strongly agency-centric	Yes	Limited	No

conventional safety planning requirements established under the federal process safety management (PSM) program and chemical risk management program. The PSM program, implemented under the Occupational Safety and Health Act, aims to minimize catastrophic releases of dangerous chemicals in a wide range of industries. Most pertinent to this chapter, facility owners subject to PSM must periodically engage in "process hazard analysis" to identify, evaluate and ultimately mitigate hazards to employees associated with covered processes. EPA's chemical risk management program imposes similar planning obligations incorporating, among other things, process hazard analysis, albeit to a smaller subset of facilities (Malloy, 2008).

The ISO goes beyond these two programs in several respects, most notably in its ambitious inclusion of "inherently safer systems," a concept grounded in prevention. Inherently safer systems means "feasible alternative equipment, processes, materials, lay-outs, and procedures meant to eliminate, minimize, or reduce the risk of a major chemical accident or release by modifying a process rather than adding external layers of protection" (Contra Costa County, 2006). An inherently safer system (ISS) thus would seek replace a toxic feedstock or catalyst with a safer alternative, eschewing engineering controls and administrative procedures such as periodic inspections. Or it may take the form of 'just-in-time inventory practices," designed to minimize the amount of a hazardous material stored at the facility at any given time. Under the ISO, a covered facility must consider ISS alternatives when performing a process hazard analysis and when designing facility additions (Contra Costa County, 2006). In contrast, neither OSHA's PSM program nor EPA's chemical risk management program require any consideration of ISS alternatives, relying instead upon engineering and administrative controls to mitigate hazards (Malloy, 2008).

The ISO is predominantly firm-centric; the regulated facilities perform the process hazard analysis and associated ISS with little agency involvement. The agency here—the Contra Costa Hazardous Materials Program (CCHMP)—provides general guidelines and default methods for ISS assessments; facilities wishing to use other methods must obtain prior approval from the agency (CCHMP, 2011). However, individual ISS analyses are not subject to regular agency review or approval, nor are they submitted to the agency or available to the public. CCHMP retains the authority to audit facilities' compliance with the ordinance, including ISS assessments and decisions regarding implementation of ISS strategies at the facilities. Research revealed no instance in which that authority was used to modify or reject a facility ISS assessment.

The ISO is prescriptive in that it requires facilities to "select and implement inherently safer systems to the greatest extent feasible" (Contra Costa County, 2006). "Feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (Contra Costa County, 2006). A CCHMP guidance document sets out specific criteria for determining feasibility, including conflict with other laws, conflict with Recognized and Generally Accepted Good Engineering Practices, and economic impracticability (CCHMP, 2011). The ISO also has a meaningful reflexive element given its heavy emphasis on management and planning within the firm. For example, the ISO itself identifies particular meth-

ods for process hazard analysis (including ISS assessment) and requires involvement of specific categories of individuals in the planning process (Contra Costa County, 2006). There is little opportunity for direct public or third party involvement in the process hazard analysis itself, or review of ISS assessments.

Regarding the three sustainable production principles, the ISO incorporates only the last: a focus on risk prevention. The CCHMP guidance calls for the use of inherently safer alternatives over engineering and administrative control wherever feasible (CCHMP, 2011). Neither the ISO itself nor the CCHMP guidance explicitly or by implication calls for life cycle thinking or integration of environmental, economic and social dimensions.

European Union REACH Authorisation The European Union's 2006 comprehensive chemical regulation, known as REACH, incorporates sustainable production to some degree (European Parliament and Council, 2006). The authorization process applies to "substances of very high concern" ("SVHC") specifically listed by the European Commission. SVHCs include substances exhibiting a range of hazards, such as carcinogenicity, mutagenicity, or reproductive toxicity (known collectively as "CMR"s), endocrine disruption, persistence in the environment and bioaccumulation (European Parliament and Council, 2006).[8] Manufacturers of articles containing such chemicals must obtain authorization from the European Commission in order to market the articles in the European Union (European Parliament and Council, 2006). REACH sets out a special authorisation standards for two categories of SVHCs: CMR's and endocrine disrupters for which a "safe" level cannot be determined, and substances that are persistent, bioaccumulative and toxic (European Parliament and Council, 2006). For these particularly worrisome SVHCs, manufacturers must perform alternatives analyses. If the analysis identifies a safer alternative, the manufacturer must prepare and implement a substitution plan for phasing-in the alternative. If no alternative exists, authorization is available only if the manufacturer demonstrates that the socio-economic benefits of the chemical use outweigh the risks (taking into account the application of the most protective, technically practical control measures) (ECHA, 2011; European Parliament and Council, 2006).

The REACH regime melds this alternatives-focused approach for SHVCs of heightened concern with a more conventional risk management for the remaining SVHCs and other chemicals. Under the risk management approach, the manufacturer (and downstream users) must adequately control the risk to human health or the environment from the use of the substance (European Parliament and Council, 2006).[9] For example, human health risks are adequately controlled where the risk management

[8] A substance becomes subject to the authorisation process upon being listed as a SVHC in Annex XIV to REACH. The listing process is quite involved, with new candidate substances identified at least every 2 years (European Parliament and Council, 2006).

[9] Article 14.6 requires manufacturers registering chemicals produced in volumes exceeding 10 tons per year to identify and apply the appropriate measures to adequately control the risks associated with the substance, and to recommend them in the safety data sheets provided to downstream users). Article 37.5 requires identification and application of adequate controls by downstream users). Article 60.2 sets the authorisation standard for SVHCs not falling within the prevention-based regime.

measures avoid exposures at levels "above which humans should not be exposed" (European Parliament and Council, 2006).[10]

The REACH authorisation process is an agency-centric program utilizing prescriptive and reflexive mechanisms. The regulated entity—typically the manufacturer of a listed SVHC—prepares the authorisation application, including an "an analysis of the alternatives considering their risks and the technical and economic feasibility of substitution" (European Parliament and Council, 2006). Also, where it believes a feasible alternative exists, the applicant must provide a substitution plan. Nonetheless, the application is subject to extensive substantive review by the agency, with a final decision of whether to grant authorisation resting with the European Commission (European Parliament and Council, 2006). The authorisation process primarily relies upon a prescriptive mode of influence; authorisations impose enforceable performance standards, use restrictions, and substitution obligations upon the firms. The process can also have a significant reflexive impact; preparing an application for authorisation can require sophisticated, deep evaluation of the production and use of regulated SVHCs.[11]

REACH authorisation is somewhat weak on the three principles underlying sustainable production. The regulation generally endorses life cycle thinking, both regarding conventional risk management and in analysis of safer alternatives.[12] In principle, it calls for integration of the relevant dimensions, although those dimensions are limited to environmental impacts, economic impacts on the firm only and technical feasibility (ECHA, 2011). Only where a feasible alternative is lacking does the program require analysis of broader socio-economic dimensions. The process does not adopt the risk prevention principle. Guidance emphasizes that in comparing the risk associated with alternatives, firms should take into account relevant risk management measures available (ECHA, 2011):

> The use of a suitable alternative must lead to a reduction in overall risks to human health and the environment compared to the [SVHC]. Therefore, in the analysis of alternatives it is essential to compare the potential risks of possible alternatives to the [SVHC] for the uses that are being applied for. This should also include the consideration of the appropriateness and effectiveness of risk management measures that control risks.

[10] With respect to environmental risks, Annex I of the regulation requires that concentrations of the substance must be kept below the level at which "adverse effects in the environmental sphere of concern are not expected to occur" (European Parliament and Council, 2006).

[11] There is significant opportunity for third party participation in the authorisation process; a firm's alternatives analysis and substitution plan are publically available, and comments are accepted by the agency during the 8 week long consultation process.

[12] The regulation states that "[r]isk management measures should be applied to ensure, when substances are manufactured, placed on the market and used, that exposure to these substances including discharges, emissions and losses, throughout the whole life-cycle is below the threshold level beyond which adverse effects may occur" (European Parliament and Council, 2006). The Authorisation guidance noted that

> "[i]deally the assessment should address all possible risks throughout the entire lifecycle of the substances including all relevant compartments and populations, even those not originally associated with the identified risk. The reason for this is that, while an alternative may reduce the specific identified risks of the Annex XIV substance, it may pose other risks at different points in its lifecycle or may shift the risks to other compartments/populations when it replaces the substance of concern" (ECHA, 2011).

California Safer Consumer Products Regulations Promulgated under Assembly Bill 1879 and Senate Bill 509 (collectively AB 1879), this program creates a comprehensive chemicals regulatory scheme having three steps: identification and prioritization of consumer products containing chemicals of greatest concern ("product-chemical combinations"); performance of "alternative analyses" by the manufacturers of those high priority product-chemical combinations; and selection of regulatory responses including outright bans, use restrictions, information disclosure, end of life management programs and other interventions (DTSC, 2013). Like TURA, the program has a strong reflexive mode of influence, setting out a fairly detailed framework for firms to follow in identifying and evaluating potentially safer alternative products.[13] The Safer Consumer Products program adds a strong prescriptive element in the regulatory response authority it provides to the implementing agency, the Department of Toxic Substances Control (DTSC). Unlike REACH, however, under California's regulation, DTSC has no express authority to require adoption of safer, feasible alternatives. Instead, it may ban the regulated product-chemical combination where "a safer alternative exists that does not contain the Chemical(s) of Concern … and that is functionally acceptable, technically feasible, and economically feasible" (DTSC, 2013).[14]

The program *appears* to be an agency-centric, although the regulations which took effect on October 1, 2013 leave some doubt as to just how invasive the agency's substantive involvement in firm-specific alternatives analyses is. Regulated entities must submit AA workplans and AA reports to DTSC for review. DTSC's review must determine whether the AA complies with "the substantive and administrative requirements" of the regulations, an ambiguous standard indeed. As discussed with regard to sustainability analysis, alternatives analysis is not simply a scientific or engineering enterprise; it includes normative judgments regarding trade-offs within and across the environmental, economic and social dimensions. As written, the regulations leave the relative roles of the agency and the regulated entity in making such judgments uncertain.

The California program performs better than TURA and REACH on the three principles of sustainable production. AB 1879, the organic statute, mandates inclusion of life cycle assessment tools in alternatives analysis (California, 2013). The regulations meet that mandate and then some, requiring consideration of exposures that occur in each relevant life cycle stage[15] when prioritizing product-chemical combinations for regulation, and when identifying and evaluating potential alternatives

[13] Unlike TURA, it also deploys market influences by requiring public disclosure of the alternatives analysis report and other relevant documentation (DTSC, 2013).

[14] Even where no safer alternative exists, DTSC may ban or phase-out unless the manufacturer demonstrates that the benefits and utility of the product significantly outweigh its overall adverse impacts, and that exposure controls can adequately protect human health and the environment (DTSC, 2013).

[15] "Life cycle" is defined as "the sum of all activities in the course of a consumer product's entire life span, including raw materials extraction, resource inputs and other resource consumption, intermediate materials processes, manufacture, packaging, transportation, distribution, use, operation and maintenance, waste generation and management, reuse and recycling, and end-of-life disposal" (DTSC, 2013).

(DTSC, 2013). The program's integration of the environmental, economic and social dimensions in decision-making is somewhat better than under REACH. The California program calls for integration of environmental and economic impacts, the latter including effects on governmental agencies and non-profit organizations as well as those on the firm (DTSC, 2013). Like REACH, the California program looks to broader socio-economic impacts in limited circumstances (DTSC, 2013). Lastly, the California regulations explicitly and fervently embrace the risk prevention principle (DTSC, 2013):

> In selecting regulatory responses, the Department shall give preference to regulatory responses providing the greatest level of inherent protection. For these purposes, "inherent protection" refers to avoidance or reduction of adverse impact … that is achieved through the redesign of a product or process, rather than through administrative or engineering controls designed to limit exposure to, or the release of, a Chemical of Concern….

European Union Ecodesign Directive The European Union has adopted an integrated product policy (IPP) intended to systematically address impacts of products across their entire life cycle (Kogler & Goodchild, 2006). The Ecodesign Directive, a major component of the IPP,[16] authorizes the European Commission to establish ecodesign requirements for covered product groups, including among other things, domestic appliances, consumer electronics, heating and water-heating equipment, and certain lighting systems (European Parliament and Council, 2009). An "ecodesign requirement" is defined as a requirement in relation to a product or its design intended to improve "the results of the manufacturer's management of the environmental aspects of the product" (European Parliament and Council, 2009). The Commission establishes ecodesign requirements for a product group by issuing generally applicable implementing measures, developed after an assessment of the environmental aspects of the relevant products, the feasibility of their improvement, and impacts on consumers and manufacturers (European Parliament and Council, 2009). Although the Ecodesign Directive empowers the Commission to set ecodesign requirements regarding toxics, occupational exposures, end of life impacts, and other negative environmental effects, thus far the promulgated implementing measures have focused only on energy efficiency and consumption (Remmen et al., 2010; Sachs, 2012).[17]

[16] Other directives include the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS), the Directive on Waste Electrical and Electronic Equipment (WEEE), the Energy Labeling Directive, and the EU Ecolabel Regulation. RoHS bans the use of lead, chromium, mercury, cadmium, poly-brominated biphenyls, and polybrominated diphenyl ethers in certain applications. WEEE establishes collection, recycling and recovering rates for covered materials (Remmen, Andersen, & Dalhammar, 2010). The Energy Labelling Directive imposes mandatory energy efficiency and consumption labelling requirements on more than ten appliance product groups (European Parliament and Council, 2010a). The EU Ecolabel Regulation is a voluntary certification program "intended to promote products with a reduced environmental impact during their entire life cycle and to provide consumers with accurate, non-deceptive, science-based information on the environmental impact of products" (European Parliament and Council, 2010b).

[17] The Commission has issued 25 implementing measures under the original and amended Ecodesign Directive, all of which have focused upon energy consumption and energy efficiency (*See* European Commission, 2013).

The Ecodesign Directive is unabashedly prescriptive and agency-centric, calling for the promulgation of generally applicable, conventional performance standards and information disclosure requirements developed by government bureaucrats following extensive information collection and analysis. The performance standards typically take the form of minimum energy performance standards, which are efficiency benchmarks of various forms that manufacturers must meet in order to market the product in the European Union (Sachs, 2012). (The Ecodesign Directive also provides for limited business to business and consumer information disclosure.) While the rule-making process includes substantial opportunities for stakeholder and public consultation and participation, the Commission itself (with the assistance of outside contractors) performs the preparatory studies and selects the ultimate ecodesign requirements.[18]

By its own terms, the Ecodesign Directive explicitly identifies sustainable production as a central goal (European Parliament and Council, 2009):

> For the vast majority of product categories available on the Community market, very different degrees of environmental impact can be noted though they provide similar functional performances. In the interest of sustainable development, continuous improvement of those products should be encouraged, notably by identifying the major sources of negative environmental impacts and avoiding transfer of pollution, when this improvement does not entail excessive costs.

However, like the EU's REACH program, the Ecodesign Directive and its implementing measures are fairly weak in terms of the three principles of sustainable production. The Ecodesign Directive explicitly adopts a life cycle perspective, mandating that the Commission must "consider the life cycle of the product and all its significant environmental aspects" in developing ecodesign requirements (European Parliament and Council, 2009). The Commission's Methodology for the Ecodesign of Energy-using Products (MEEuP) accordingly uses traditional life cycle analysis approaches to assess the need for and impact of potential ecodesign measures (Kemna, 2011). The Directive supports the notion that the environmental, social and economic dimensions of production and consumption should be integrated, but falls short of achieving that goal in two ways: the scope of coverage and the extent of integration. Of the three, the economic dimension is the best developed; the Directive and the MEEuP focus extensively on economic impacts to consumers, and impacts on manufacturers in terms of cost, competitiveness, innovation and access to markets. The environmental dimension focuses primarily upon energy and resource efficiency and consumption, leaving other concerns such as toxics use and occupational exposures to other regulatory programs (Remmen et al., 2010; Sachs, 2012). The social dimension receives little attention beyond some consideration of impacts on employment. The third principle of sustainable production—the preference for risk prevention over risk management—is nowhere to be found in the Ecodesign Directive, the MEEuP, or the implementing measures.

[18] In some circumstances, industry may negotiate self-regulatory measures for any product group where such measures can deliver the policy objectives faster or in a less costly manner than mandatory requirements (European Parliament and Council, 2009). As of January 5, 2014, two self-regulatory measures have been approved covering imaging equipment (such as printers) and complex set top boxes, respectively (European Commission, 2013).

So where are we in terms of integrating sustainable production into existing regulation as reflected in these programs? Each program represents a substantial step forward towards integration, but none has completed the journey. For TURA this limited integration could be explained as a question of timing; TURA was enacted in 1989, some 3 years before the Rio Declaration focused attention on sustainable production. For the Contra Costa ISO it may be a question of focus. That effort arose from specific safety issues associated with refineries and chemical plants, and as such was grounded in the occupational safety and facility planning milieu. But REACH, the California Safer Consumer Products regulations and the EU Ecodesign Directive all situate themselves in sustainable production. Their failure to operationalize the concept fully suggests just how challenging the effort is from a political and methodological standpoint.

All that said, the five programs give us some sense what sustainability-based regulation may look like, and highlight particular issues in terms of program design and implementation. The remainder of this chapter surveys some of those issues.

1.5 Considering Regulatory Design Options

The five programs described above illustrate different configurations varying across the regulatory features of Mode of Influence (prescriptive vs. reflexive) and Locus of Control (firm-centric vs. agency-centric). In practice, of course, the distinctions within those two features are not quite so stark. For example, the California Safer Consumer Products program has both reflexive and prescriptive qualities. Likewise a program may be firm-centric in some aspects (e.g., the firm controlling design and implementation of the sustainability analysis process), but agency-centric in others (e.g., the regulator determining whether an alternative product design is adopted). In other words, Mode of Influence and Locus of Control themselves are not absolute states; rather a regulatory program may exhibit various degrees of prescription, reflexivity, firm-centricity and agency-centricity.

Given the variety and plasticity of design options described above, how are policymakers and other stakeholders to determine the best regulatory design? That question implicates challenging empirical issues and normative concerns, not the least of which is how one should define "best regulatory design." Its resolution requires more than a chapter. With that in mind, this section instead presents a series of factors that should be considered in crafting a mandatory program intended to advance sustainable production. The design factors provide some guidance in terms of the degree of prescription, reflexivity, firm-centricity and agency-centricity called for under various conditions.[19]

[19] The factors focus upon "technical" design issues such as capacity, resources and the like. The discussion leaves for another day questions regarding the normative basis for various forms of intervention (Malloy, 2014). It also leaves the role of politics to the side. For a discussion of the political history of some of the programs discussed in this chapter, see Ellenbecker and Geiser (2011) (TURA) and Iles (2011) (California Safer Consumer Products regulations).

Institutional Capacity of the Agency "Institutional capacity" refers to the technical expertise and knowledge required for the analysis and decision-making called for in the program, as well as the administrative and management structure required for implementation (Tripp & Dudek, 1989). In the context of sustainability-based regulation, the technical expertise required cuts across a number of domains, and implicates both public and private dimensions. To a significant degree, sustainability analysis involves aspects of product design, engineering and business finance; that is, the process by which private industry designs the goods it sells. Yet sustainability analysis adds health, environmental and social objectives to the mix of concerns taken into account by the product designer.

The institutional capacity factor goes primarily to the question of centricity. Of most concern here is whether an administrative agency is suited to evaluating and intervening in product or process design. Conventional regulation primarily works around the edges of the production process, but rarely intrudes in an active or even intentional way into substantive product or process design. Certainly many regulatory programs place constraints on the effects of production and subsequent consumption—establishing work practice standards, emissions limits, and waste management requirements. Over time, regulatory agencies have developed substantial expertise in industrial operations and pollution control technologies (Malloy, 2010). In limited cases regulators have even banned particularly dangerous products and processes. But even in the case of product bans, the government tells the manufacturer not to use "X" as an ingredient; seldom does it declare what the replacement should be. In contrast, the shift of focus to sustainable production brings government squarely into product and process design, particularly with the associated emphasis on life cycle thinking and risk prevention. Of course the nature and extent of the intervention depends upon the particular form of sustainability-based regulation used, but there is no disputing that it is different in kind than conventional regulation (Malloy, 2014).

Regulatory agencies clearly have expertise and knowledge regarding health and environmental concerns, and social impacts of business activity; these areas are central to conventional regulation. In terms of technical expertise and knowledge regarding business activities, agencies typically have significant engineering, scientific and economic expertise (either in house or through consultants) regarding production processes in most regulated sectors, albeit to a lesser degree than many of the companies within those sectors. For example, given years of regulatory engagement, regulators are quite proficient in the design and operation of oil refining and chemical production processes. Likewise, federal and state agencies with extensive pollution prevention programs may be well versed in the operations of certain small and medium sized businesses such as automobile repair, electroplating and professional garment care. Indeed, depending upon the size and sophistication of the business involved, agencies may also have superior expertise and knowledge regarding potential alternative feedstocks, ingredients or processes (Malloy, 2010). However, agencies are less likely to be versed in product design, particularly for

consumer goods, and will find it difficult to access firms' tacit knowledge, such as deep understanding of individual companies' production processes, or preferences of particular customers. In many contexts, expertise in product design and marketing is likely to be critical as the slow uptake of replacements to the incandescent light bulb has demonstrated (Marchant, 2009).

As a general matter, more substantial agency institutional expertise and knowledge regarding a product or process supports greater agency involvement in sustainability analysis and decision-making regarding the viability of sustainable alternatives. Where agencies lack independent expertise, or access to the types of tacit knowledge that often drive product design, more responsibility should rest with the firm (Coglianese & Lazer, 2003; Dorbeck-Jung & Shelly-Egan, 2013). This general principle is of course subject to several significant caveats. First, in some cases the lack of institutional capacity may be a transition issue; as more sustainability-based regulations emerge, agencies may develop the necessary expertise and knowledge through experience or by recruitment of personnel in the requisite disciplines. Second, agencies may be able to secure the requisite expertise and knowledge, including tacit knowledge, by out-sourcing the evaluation function to third party contractors, as is often done even in the conventional regulatory process. Third, institutional capacity is but one factor to be considered; even if an agency or firm has sufficient institutional capacity, other factors may counsel against resting the evaluative responsibility with one or the other.

Level of Agency Resources This factor focuses upon the costs of implementing a sustainability-based program. Like institutional capacity, it centers largely on centricity. An agency-centric program, particularly one in which the agency actually performs the sustainability analyses itself rather than evaluating work performed by regulated firms, will require more funding than a firm-centric program (Coglianese & Lazer, 2003; Hirsch, 2010). Thus, the level of available funding can be an important factor in determining whether to adopt an agency-centric approach. For example, policy-makers operating in a resource-constrained environment may opt for a firm-centric approach, minimizing the costs to government. Even absent an explicit trade-off of that sort, funding structures can substantially affect the profile of the program. Where policy-makers create an agency-centric approach but fail to adequate fund it, the result may be a *de facto* firm-centric program in which the debilitated agency is unable to exercise its mandate. Likewise, lack of a sustainable funding mechanism could make a program vulnerable to later legislatures or administrations. Former EPA Administrator Ruckelshaus described such a situation regarding conventional programs:

> Currently, some members of Congress seek to stop EPA from doing what previous Congresses have mandated it to do, by refusing to give it the funds to act. That is a little like cheering the launch of an airplane bound from New York to Los Angeles while only giving it the gas to reach Chicago, and then decrying the crash as further evidence of pilot ineptitude (Ruckelshaus, 1996).

Concerns regarding costs do not necessarily support abstention from agency intervention in every setting. Such concerns may be addressed through at least three other options. The first directly increases the revenue available to the agency through dedicated fees, essentially establishing a new, sustainable funding mechanism for the program. The REACH program is illustrative. The implementing agency, the European Chemicals Agency, garners a substantial portion of its budget through fees (European Parliament and Council, 2006). The second limits the scope of agency-centric programs to industry sectors and product classes in which the agency's costs are manageable. For example, the program might avoid industry sectors in which production processes or products are highly heterogeneous and thus would require significant agency resources to gain the needed expertise and knowledge (Bennear, 2006). The third relies upon the market to provide third party oversight of the regulated companies, oversight that agency have provided had adequate resources been available. Here the firm would be required to obtain an independent third party consultant's certification that the sustainability analysis (and the implementation decision in a prescriptive program) meets the substantive and procedure requirements of the regulations (Coglianese & Lazer, 2003). The review and certification is intended enhance the quality of the submission, and reduce the time and resources required for agency review, essentially shifting much of the review costs to the firm. The requirement that the consultant be independent acknowledges the fact that the manufacturer will have a material stake in the outcome of the analysis, particularly where the potential alternatives could supplant the manufacturer's product.[20]

Goal Alignment This factor considers the extent to which the goals and norms of the firm are aligned with the sustainability goals of the regulatory program. Where the goals are aligned, a product design selected by the firm after a properly performed sustainability analysis would likely advance the regulatory goals. But consider the case in which the goals are not aligned—for example, where the firm places significantly less importance on sustainability than on short-term financial results. In that case, one may reasonably expect that, absent some agency intervention, the firm may make the more profitable, less sustainable choice. This design issue relates mostly to questions of prescription and reflexivity, but also affects centricity.

The reflexive mechanism's efficacy depends upon goal alignment; it assumes that the self-reflection and learning engendered through planning and management requirements will lead firms to act in accord with the social goals embedded in the program's requirements (Gunningham & Sinclair, 2009; Hirsch, 2010). In the context of sustainability-based regulations, the social goal of advancing sustainable production would be reflected in the program's standards for sustainability analysis, such as the data to be collected, the criteria to be considered (i.e., health effects, social impacts and so on), and the weight to be accorded those criteria. Where the

[20] Of course experience in the accounting sector has shown that third parties are not consistently able to maintain their independence and may be "captured" by their clients (Coffee, 2004). Nonetheless, the likelihood of such capture is substantially increased where the persons performing the analysis are employees of the firm.

goals of the firm mirror the regulatory goals, the firm is likely to implement the outcome of the sustainability analysis without agency intervention. Where the goals are misaligned, however, policy-makers cannot be so confident (Bennear, 2006; Dorbeck-Jung & Shelly-Egan, 2013). In some such situations, the product design favored by the sustainability analysis may fortuitously also meet the private goals of the firm—the so-called "win-win" scenario. Yet that happy outcome is by no means guaranteed or even demonstrably typical. In many cases the more sustainable product or process may conflict with the financial or strategic interests of the firm (Malloy, 2014). In those situations it is likely that the firm would forgo the sustainable alternative in pursuit of its private interests. Thus, where goal alignment within the regulated community is in question, this factor favors the prescriptive approach of requiring implementation of the sustainable alternative.

The extent of goal alignment is also relevant to the question of centricity. Where the firm's goals are inconsistent with those of the regulatory program, a firm may be more likely to engage in cosmetic compliance. Cosmetic compliance involves "going through the motions" without addressing the underlying regulatory goals in a meaningful way (Calcott, 2010; Gunningham & Sinclair, 2009). Greater agency involvement and oversight of the sustainability analysis process is necessary in such situations. Cosmetic compliance from misaligned goals can be especially troubling in prescriptive programs. Here the firm may purposefully skew the results of the sustainability analysis and the subsequent implementation decision so as to avoid the obligation to adopt a particular alternative product or process design. Use of a strong agency-centric design may be appropriate where policymakers anticipate such behavior among firms covered by the regulatory program.

Reflexive Capacity of the Firm Reflexive law places a great deal of weight upon the firm's "reflexive capacity;" i.e. its capacity to learn from and respond to self-reflective evaluation (Lynch-Wood & Williamson, 2011; Scott, 2008). However, reflexive capacity will vary among firms. While some firms will be responsive to reflexive regulation, internal organizational limitations may prevent others from altering their behavior despite the planning and systematic reviews required under the reflexive mechanism. In crafting regulatory programs, policymakers should pay attention to the reflexive capacity of the regulated community.

Such organization limitations may relate to designing the sustainability analysis process itself, to implementing it or to both. For example, smaller firms may lack the resources and technical expertise to properly design or implement sustainability analysis. In response, the agency might retain the reflexive mechanism, but provide education, technical support and more intensive agency oversight (Gilad, 2010). In such cases, increasing the agency-centric nature of the program actually enhances the relative effectiveness of the reflexive mechanism. Larger firms may suffer from structural limitations that undermine reflexive capacity at the implementation stage, such as excessive organizational complexity, communication blockages or ossification (Gilad, 2010; Gunningham & Sinclair, 2009). In those situations, policymakers must assess the depth and permanence of the structural problems in the relevant industry sector. Some firms may respond to the reflexive obligation by resolving or

ameliorating their structural problems while others may remain mired in their existing state (Gilad, 2010). If the latter case is expected, an agency may be more inclined to adopt a prescriptive, agency-centric program.[21]

1.6 Conclusion

Although the concepts of sustainability and sustainable production have been on the scene for decades, legal systems in the United States and Europe are only now starting to integrate them into public health and environmental regulation. The challenges facing sustainability-minded policymakers are daunting, mixing complex regulatory design issues, difficult methodological questions regarding sustainability analysis, and thorny normative concerns. This chapter has focused on regulatory design, providing a snapshot of nascent programs and a preliminary guide for future development. Meaningful integration of sustainable production into mainstream regulation will require substantial further efforts on all three fronts.

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[21] Ideally as part of the regulatory design process, policymakers would chart the reflexive capacities of different types of firms within regulated community by sector, size or other metric. Such a complicated undertaking is beyond the scope of this chapter. For an example of such an attempt, see Lynch-Wood and Williamson (2011).

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Chapter 2
Mandating Sustainability: When Federal Legislation May Preempt the Best Green Building Code Intentions

Darren A. Prum

Abstract As sustainable practices continue to sweep across the country, the federal, state, and local governments chose to further encourage the construction industry through various legislative and regulatory actions. In these initiatives, the policymakers need to decide on whether to incentivize participants or compel compliance as well as whether to set their own standards legislatively or to adopt programs developed by third party organizations. In making these decisions and adopting legislation, the state and local policymakers may inadvertently spark another round in the lengthy struggle for power with the federal government under the Supremacy Clause of the Constitution. With this situation at hand, this chapter considers the approaches taken by federal and state governments, the solutions presented by third party organizations, and the responses by the courts to such legislative initiatives relating to environmentally friendly policies that promote sustainability mandates in construction.

2.1 Introduction

In a recent special report from the University of Pennsylvania's Initiative for Global Environmental Leadership, the authors point out that many state and local governments are rethinking their approach to green buildings and are promoting new methods to achieve greater energy efficiency from the built environment (Institute for Global Environmental Leadership). They observe that "green building has gone from a feel-good exercise to an impending baseline for all construction." Illustrating this point, policymakers around the country collectively face the daunting task of

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implementing strategies that will motivate participants into embracing environmentally friendly construction practices and structures while advancing their sustainability goals (Prum, Aalberts, & Del Percio, 2012).

Accordingly, each jurisdiction takes a different approach to addressing their own sustainability goals within their sphere of influence. For instance, some policymakers made the goals internally applicable to projects undertaken by the government; while others attempt to set requirements for private developers.

In taking these actions, each group of policymakers needed to address whether to set their own standards through statutes and regulations or to compel compliance through the use of programs developed by third party organizations. Consequently, these actions may trigger a conflict between the federal and state government laws and regulations that requires the courts to intervene and determine whether the Supremacy Clause of the Constitution applies.

To better comprehend how such conflicts happen, the varying approaches undertaken by the different sets of policymakers needs a further explanation. To this extent, I present the core policies pursued by the federal government followed by an overview of some of the jurisdictions with pioneering solutions along with a summary of some of the more prominent third party offerings to assist policymakers with their task. This provides the underlying foundation for the consideration of the Supremacy Clause and two separate cases where the federal courts came to opposite conclusions as to whether a lowered tiered government's efforts to promote sustainable building codes within its jurisdiction was preempted by a national policy promulgated by Congress decades earlier.

2.2 Green Buildings in the United States

Given the desire by policymakers to promote sustainable construction and buildings within their jurisdictions, a patchwork of approaches currently exists across the country. Each level of government maintains its own unique mission, must respond to different sets of stakeholders and constituencies, and draws upon distinct resources on both a financial and physical level. However, all levels of government must address whether to mandate or incentivize sustainable building policies as well as whether to determine such standards internally or to take advantage of the offerings made by third party organizations. As a result, the stimulus and approach offered by the different levels of government and the programs that they implement requires consideration.

2.3 The Federal Government's Approach

When taking into account the federal government's approach to the nation's building inventory, the main policies tend to focus on internal activities that reduce its environmental footprint rather than regulating private development standards.

In 2005, Congress instructed the National Institute of Building Sciences to determine whether the currently applied benchmarks for construction incorporated the latest technological standards. This legislative directive led to the Office of the Federal Environmental Executive (OFEE) conceiving and obtaining the signature of President George W. Bush on January 24, 2007, of Executive Order 13423 (EO), which reinforced and provided instructions for all parts of the executive branch of government to adhere to the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding previously agreed upon by 19 different agencies in January 2006.

Subsequently, Congress turned many parts of EO 13423 into law when it passed the Energy Independence and Security Act of 2007 (EISA). Through this legislation, Congress revised sections of the National Energy Conservation Policy Act and mandated energy management goals across the federal government. In addition, the EISA directed different organizations within the government like the General Services Administration (GSA) and the Department of Energy (DOE) to take action with regard to high performance and green buildings.

Raising the standards even higher on specific types of structures, President Barack Obama signed EO 13514, which included additional goals and objectives applicable to high performance buildings for all parts of the executive branch of the government. Beyond the existing goals in EO 13423, EO 13514 repeated the requirement to achieve 15 % of an agency's existing building inventory via sustainable practices and instructed the executive branch to make annual progress towards 100 % conformance with the guiding principles established in the 2006 Memorandum of Understanding (Green Building Certification Institute, 2011).

In response to these directives, the Environmental Protection Agency, the OFEE, and the Whole Building Design Guide (2010) of the National Institute of Building Sciences jointly developed the Federal Green Construction Guide for Specifiers (FGCGS). In this document, the drafters developed recommendations for internal use when listing specifications for a project in order to ensure compliance with all applicable high performance and green building directives (GSA, 2010).

Contained in Section 1.3 Environmental Goals, the FGCGS addresses independent verification requirements with details covering the directives arising from different parts of the government. The Specifier Note begins by explaining that after modification in 2002, OMB A-11 now states, "Agencies are encouraged to incorporate Energy Star or LEED building standards into up front design concepts for new construction and/or building renovations." It further clarifies that the GSA supports the adoption of the USGBC's LEED program and the availability of other systems since 2003. The note specifically mentions other programs like the Austin Green Building Program and Green Globes while the guide contains language for these as well as the ASTM 2430 and ICC-700-2008 National Green Building Standards (Meadows, 2010).

Moreover, the GSA (n.d.) may promote the LEED program as its main third party verifier for high performance or green buildings; but it does not remain an exclusive one for the federal government. Other organizations within the executive

branch like the Department of Veterans Affairs (2010) decided to partner with Green Globes as its standard when building its different facilities across the country to comply with the goals of EO 13423.

Nevertheless, Congress also chose to enact legislation in several instances that mandated energy efficiency for heating, ventilation, and air conditioning (HVAC) products placed in private developments. In response to the 1973 oil crisis, Congress decided to set federal energy efficiency standards for HVAC products when it passed the Energy Policy and Conservation Act of 1975 (EPCA) followed by the amendments contained in National Appliance Energy Conservation Act of 1987 (NAECA) and the Energy Policy Act of 1992 (EPACT).

Collectively, these pieces of legislation established national standards for the performance of HVAC equipment in buildings. Meanwhile, Congress included language that attempted to preempt lower tiered policymakers from undermining national goals with respect to energy efficiency, energy use, or water use of any covered product with limited exceptions.

However, in the 1992 amendments of EPACT, Congress tried to clarify its prior position as having a dual purpose "to reduce the Nation's consumption of energy and to reduce the regulatory and economic burdens on the appliance manufacturing industry through the establishment of national energy conservation standards for major residential appliances." The EPCA included provisions to encourage states to adopt and update energy efficiency codes as well as provided grants to fund such initiatives.

Hence, the federal government's main efforts appear to focus on its own building initiatives and not setting a national standard; but in limited situations where a broader policy exists like protecting a national market, Congress demonstrated the willingness to legislate and set a benchmark that may inhibit state and local jurisdictions to promote sustainability in its construction codes.

2.4 State and Local Governments with Internal Approaches

On the state and local government level, two different programs blazed the trail for some of the most popular verification systems in use today. The Austin Energy Green Building program (AEGB) pioneered the methodology of evaluating and measuring the impact of a building upon the environment; while the State of New York introduced the concept of using tax incentives as an enticement to motivate private developers into voluntarily choosing to pursue certification of their projects. In 2007, the State of California decided to eschew the voluntary compliance model and developed CALGreen as the first statewide and comprehensive green building standard. Accordingly, this section examines the three different policy approaches implemented internally by state and local governments to certify buildings as sustainable and gain participation from private developers and others involved in the construction industry.

2.5 City of Austin

In response to more stringent local government requirements, the local utility in Austin, Texas, developed and introduced the Austin Energy Green Building (AEGB, 2010a, 2010a, 2010c, n.d.) program in 1985. Initiating an innovative approach to quantifying the sustainability features of a building, the creators of the AEGB program developed a system that awarded a structure a rating based on a five-point scale for its impact upon the environment and community. By considering many complex and contributing features (e.g.; climate, building and energy efficiency, water and materials, durability, health, and safety) found in commercial, residential, and multifamily structures, the program introduced a novel approach that formed the basis of other programs.

In its current form, the AEGB comprises three different programs: Commercial Green Building, Residential Green Building, and Multi-Family Green Building. The programs utilize a computerized rating system to assign points to a project that follows sustainable building practices and construction while verifying the participants' actions though site visits. This means an AEGB representative will physically examine the site and building during all phases of the construction project in order to ensure compliance.

Offering a flexible approach as part of the program, the rating system allows applicants to choose between "Performance" or "Prescriptive" tracks for earning credits. The "Prescriptive" approach supplies exact solutions on how to gain points for particular aspects of a project; whereas the "Performance" direction provides the applicant with the leeway to choose other methods to fulfill the requirement but with the burden of demonstrating equivalency to other sustainable practices in order to receive the credit. Based on this adaptable model, the rating program can evaluate the sustainable features of the building and assign it a star level based on the total points achieved. Accordingly, the more stars assigned to a building signifies an increase in its green features above the basic requirements at the one star level.

Hence, the AEGB program pioneered a novel and rigorous approach to measuring the sustainable features found within a building while launching a subsequent movement and inspiring other third party verification systems across the country.

2.6 New York

Initially proposed in 1995, the State of New York launched the country's first tax-based incentive program (GBTC) for green buildings in 2000. As part of the unique challenges in determining the qualifications for the tax credit, the drafters of the legislation needed to create its own program because state law prohibited the adoption of external standards that may change over time. Consequently, New York developed its own system that prescribed the qualifications for the tax credit; although most of the projects eventually received LEED certification on their own volition.

Heavily relying on a structure's energy usage as its method for determining compliance, this unique aspect of the GBTC creates ongoing obligations for those receiving the benefit. As such, the program participants bear the burden of monitoring the performance of the building and its associated tenants.

Moreover, the GBTC expects the completion of an indoor air quality plan prior to and during construction as well as in the operation and maintenance of the building following its commissioning; however a LEED rated building need not complete one in order to be deemed compliant. This recordkeeping covers performance reports for indoor air quality and energy. These documents include findings from annual air monitoring evaluations along with the verification of the enforcement of smoking provisions and evidence demonstrating a responsible party resolved any requests to sort out any indoor air quality issues.

Also, the participants must keep records of the monthly and initial performance results of photovoltaic and fuel cell technologies in conjunction with the annual energy consumption for the building; however, the regulations leave any comparisons between theoretical and actual performance to research projects. The GBTC determines energy consumption compliance based on the structure's usage; whereas the LEED requirements use material costs as a basis for its choices.

While the New York approach for certifying a green building differs from the alternative based LEED program, it also maintains some similarities as well. This occurs with the use of refrigerants and the associated equipment. In these situations, the regulations turn to the LEED rating system's language for compliance. Likewise, the enabling legislation also requires the GBTC to follow the LEED program in building materials, finishes, and furnishings (NYSDEC, n.d.). Thus, the GBTC program generally corresponds with the LEED requirements as long as it also includes the Additional Commissioning Credit with Systems and an Energy Management manual and post-occupancy review (Kneeland, 2006).

As a result, many other states took notice of New York's strategy that gained significant support and participation from private industry by offering a tax incentive as a reward for further advancing the sustainability and environmental policies and goals of the jurisdiction (Prum, 2009).

2.7 CALGreen

Taking a far more ambitious approach to incorporating sustainable features into development projects by addressing a larger scope than previously attempted while following in the footsteps of other governments that created their own standards, The California Building Standards Commission received direction from Governor Schwarzenegger in early 2007 to draft regulations for the 2010 code adoption process with respect to residential, commercial, and public green building construction. This directive brought about the drafting and adoption of the nation's first statewide and comprehensive green building standard called CALGreen. California began

implementing this behemoth endeavor on January 1, 2011, which set minimal construction requirements for the entire jurisdiction with respect to sustainability.

Keeping with the existing structure in the California Building Standards Code, the CALGreen regulations continues with provisions for application and responsibility. It applies different sections for residential and nonresidential uses as the first division. Then, the regulations separate the two divisions based on the type of structure and between the four state agencies that maintain specific authority over certain building standards. Within each category, CALGreen creates an underlying group of mandatory requirements, which requires adoption by each municipality. In addition, the code offers two supplementary and voluntary code provisions referred to as CALGreen Tier 1 and CALGreen Tier 2 for adoption by each municipality as well.

In terms of compliance, a building will automatically be considered "CALGreen certified" if it adheres to this building code, which was already part of its legal obligations under the statewide regulations. Likewise, a building that meets the more rigorous Tier 1 or 2 standards could assert "CALGreen Tier 1 Certified" or "CALGreen Tier 2 Certified" based on its additional features. Interestingly and in contrast to the later discussed LEED and Green Globes programs, the state does not demonstrate any intention to create a registry or identifying mark for those buildings that meet any of its standards.

Thus, the recent implementation of CALGreen offers one of the first broad based mandatory policies that will take time to determine whether private developers and others involved in the construction industry will accept it as progress or choose to fight its implementation across the state. Hence, each of the three governmental approaches pioneered a different aspect of the modern movement to motivate participants to support and promote environmentally friendly practices across the construction industry that coincide with a jurisdiction's sustainability goals while developing a system to evaluate and assess green or high performance buildings in quantifiable terms.

2.8 Private Approaches

In some instances, a jurisdiction may wish to promote environmentally friendly policies to attain important goals but may not maintain adequate enough resources to implement a program or properly draft legislation on its own. To assist in these types of situations, a number of different third party organizations offer a variety of approaches to fill this need. Some organizations offer full service programs that try to quantify and signify a building's sustainability features, while others provide policymakers with tools and language for adoption that get incorporated into the law either in part or as a whole. Accordingly, this section addresses a representative sample of the many programs under consideration or already adopted in many jurisdictions around the country as well as the latest model green building code available.

2.9 Leadership in Energy and Environmental Design

The United States Green Building Council (USGBC) owns and operates the Leadership in Energy and Environmental Design (LEED) program, which provides the vast majority of certifications. The program emerged in 1998 after 4 years of intense development. Building upon the AEGB program and its resources, the USGBC team decided to utilize a market based approach that rewarded developers for choosing sustainable alternatives in their construction and completed structure instead of compelling compliance through regulations while meeting the diverse needs of the many participants in the industry and across the country as a workable system.

Consequently, the LEED program encompasses a collection of rating systems that attempts to quantify the sustainability features contained in the construction and operation of the building. Within this collection, the LEED program offers different certification tracks for New Construction (NC), Existing Building Operations (EB), Commercial Interiors Projects (CI), Core and Shell Projects (CS), Homes (H), and Neighborhood Development (ND). Moreover, LEED now includes applications for lodging, retail stores, campuses, volume building programs, healthcare facilities, laboratories, and multifamily residences due to market demands for new guides; even though the developers of the program originally created it to measure office buildings.

For each LEED program type, an oversight committee sets the standard by assigning points for each category based on agreed upon sustainable practices (LEED committees, LEED rating systems). This allows each program type to emphasize different sustainable practices based on its committee's judgment while creating minimum standards and characteristics. To give extra recognition for those projects that incorporate more sustainable features, the LEED program offers the tiers of silver, gold, and platinum for those buildings that exceed the required points for the basic certification.

In order to confirm the qualifications of a given project, the LEED program follows a document based verification approach. The program sets forth basic criteria for sustainable practices across all categories, but it also allows for different alternatives within a set list of options for an adaptable compliance standard. Consequently, the LEED program standard provides for geographic variability while ensuring a level of sustainable compliance for each project it endorses through certification.

Given the flexibility and rigor associated with the LEED program as well as many other beneficial aspects, various different governmental entities adopted it for use within their jurisdiction because it offers a sufficiently rigorous and reliable solution that coincides nicely with their own sustainable policy objectives.

2.10 Green Globes

Competing with the LEED program, Green Globes provides the other main third party certification for green buildings in the U.S. This program traces its roots to the United Kingdom's efforts between 1988 and 1992 to advance high performance

standards during the construction of office buildings within England, which lead to the Building Research Establishment's Environmental Assessment Method (BREEAM). After garnering support and popularity from the Canadian Government and trade organizations under the name Go Green Plus, the Green Building Institute brought the program to the U.S.

Taking a different approach, Green Globes supplies a tool for developers to ascertain the environmental sensitivity for new construction projects or those undergoing continual improvements within an existing structure. It completes the task through a self-assessment and verification approach based upon a customized questionnaire derived from the construction documents section of the applicable program that establishes the level of qualification. The Green Globes method assigns the points to categories based on sustainability practices and characteristics but calculates its level of achievement using only those features available to the project and not those considered outside of a developer's control. Upon attaining a minimal compliance level of 35 %, an independent third party assessor reviews the documents, visits the project, and makes a recommendation to the Green Building Institute to issue certification for the building based on a scale of one to four green globes.

In explaining the contrasting approaches, commentator and academic Charles Kibert (2008) pointed out many of the differences between the Green Globes system and the LEED program. He explains that, in the LEED system, a project team completes and submits documents electronically to an evaluation group, but those with intimate knowledge neither contact nor discuss the project and its green features with the reviewers. Furthermore, the independent assessor in Green Globes physically examines the project to determine whether the constructed building matches the upfront promises, a step that is not required under current versions of LEED. Finally, Green Globes uses a variable method to calculate the total achievable points whereas LEED utilizes a fixed system. Accordingly, Green Globes includes only those categories and subcategories available to a project; the LEED system does not reduce its certification criteria for characteristics that may be outside of a development's control.

Therefore, the Green Globes system offers an alternative to many jurisdictions that desire a different approach than required by the LEED program but still wishes to impose a robust and rigorous third party evaluation that also includes a compliance aspect to the prevailing goal of promoting sustainability in the built environment.

2.11 International Green Construction Code

Considered another third party organization but with a different mission, the International Code Council (ICC) developed its own standard "to meet new market needs through model code regulations that promote safe and sustainable

construction in an integrated fashion with the ICC Family of Codes" (International Code Council, 2010). Following several years of development and time set aside for public comment, the ICC released public code version 2.0 of the International Green Construction Code (IgCC, n.d.) in March 2012. This newcomer to the sustainably built environment market looked "to drive green and sustainable building significantly beyond the market segment that has been transformed by voluntary rating systems" (International Code Council, 2010).

To this end, the IgCC offers adopting jurisdictions a comprehensive approach for new and existing buildings as well as to all residential structures over three stories a solution that augments existing ICC model codes with specifications that address sustainable performance characteristics such as energy, water, natural resources, and material conservation. It looks to piggyback on existing governmental administration and enforcement mechanisms to deliver a more environmentally friendly result where adopted and implemented.

In an opposite approach to the LEED and Green Globes programs that offer numerous options with few requirements, the IgCC follows a strategy formed mainly around mandatory directives. The IgCC provides some flexibility in its compliance paths by allowing projects to choose between a prescriptive based option and modeled performance solution.

However, a jurisdiction may use its discretion to include additional requirements in whole or separately that require project owners to select "electives" for a particular project. These "electives" then turn into compulsory requirements for the particular building once selected by the project owner. Accordingly, a jurisdiction or political subdivisions may choose to adopt the IgCC or a portion thereof through the use its administrative powers.

In response to this option, Rhode Island became the first state to adopt a preliminary version of the IgCC when Governor Carcieri signed the Green Buildings Act into law on November 9, 2009. Following Rhode Island, the North Carolina Building Code Council (2010) adopted the Rainwater Collection and Distribution Systems section of the IgCC, Florida passed legislation allowing the IgCC as an option for the retrofitting and new construction of all state-owned facilities (Energy Conservation and Sustainable Buildings Act), Oregon based its alternate building code called the Commercial Reach Code on the IgCC, and Maryland allowed its Department of Housing and Community Development to adopt by regulation the IgCC (Maryland Public Safety Code).

Thus, these private organizations serve important roles in advancing a jurisdiction's sustainability goals with respect to providing an infrastructure and methodology to help quantify these difficult to capture objectives while cost effectively supplying policymakers with resources that they could not access otherwise. Consequently, policymakers across the country have at their disposal a wide range of options and experience from both the public and private sectors when trying to advance their sustainability goals as applied to building policy; but they must also keep in mind that their powers to effect change maintain limitations as well.

2.12 Federal Preemption

Historically, the federal and state governments struggled over the scope of regulatory authority. In response to this adversarial situation, the drafters of The Constitution employed a variety of solutions to resolve the degree and magnitude of authority afforded each level of government (U.S. Const. amend. X; U.S. Const. art. I, § 3, cl. 1, I, § 8, I, § 10, II § 1, V). As such, Article VI of the Constitution recognized that federal laws provided superior authority to conflicting state statutes and became known as the Supremacy Clause.

Further refining this Constitutional directive, the courts began to hold that preemption could exist either expressly or impliedly (Nowak, 2010). Under express preemption, Congress must explicitly state its intention to regulate and directly prohibit a state from enacting conflicting legislation. Whereas in an implied preemption situation, Congress must decide to dominate the entire field of regulation and effectively leave nothing more for the state to control.

As such, the inevitable conflict between the federal and state governments regarding the authority and scope to adopt more environmentally friendly building codes to address sustainability policies turned to the courts to determine whether the Supremacy Clause applied to some of these progressive pieces of legislation.

2.13 AHRI v. City of Albuquerque

In an effort to upgrade the City of Albuquerque's building regulations, the Mayor formed a Green Ribbon Task Force in 2007 charged with the task of developing and implementing directives to make meaningful reductions in greenhouse gas emissions in a manner that also afforded industry a flexible framework for innovative solutions that corresponded with progressive energy applications. After holding meetings to discuss the issues, the task force put forward recommendations on various alternatives on how to improve energy efficiency in the built environment. Based on these recommendations, the City's Green Building Manager drafted a two volume code for later adoption by the Albuquerque City Council called the Albuquerque Energy Conservation Code and High Performance Building Ordinance (Albuquerque Green Building Code). In 2007, the city council adopted both volumes for implementation as of October 1, 2008.

In both volumes of the code, a controversial requirement addressed the replacement of HVAC equipment in existing buildings and homes. Both codes mandated that a building owner that decided to replace the existing HVAC equipment exceed federal energy efficiency requirements by at least 30 %. In order to comply with this requirement, the code allowed the building owner several options. The building owner could either attain a LEED Silver certification and demonstrate that the designs provided 30 % more efficiency or implement and install the specific components specified in the code that met the City of Albuquerque's energy goal. However, in a residential dwelling, the structure could also become compliant if it

met the guidelines of Build Green New Mexico or if the owner met certain mandatory requirements that exceeded federal energy efficiency specifications on a standard reference design.

Subsequently, three trade associations representing manufacturers, distributors and installers of HVAC products as well as 12 local distributors and contractors who sell and install HVAC products challenged specific provisions of the newly adopted code as improper under the Supremacy Clause of the Constitution. The plaintiffs asserted that the EPCA, NAECA, and EPACT preempted the Albuquerque Green Building Code because Congress already set minimum energy efficiency standards for buildings. Following the filing of the claim, the plaintiffs sought and received a preliminary injunction suspending the enforcement of the Albuquerque Green Building Code.

In its final decision on the matter, the New Mexico District Court evaluated each volume and related requirement separately to determine if the Supremacy Clause applied. In evaluating the Albuquerque Green Building Code, the court explained that "[t]he plain language of the preemption statute makes clear that Congress intended the preemption to be broad in scope. Congress recognized that [NAECA] 'preempts state law under most circumstances.'" This served as the basis for the court to invalidate the more stringent energy efficiency standards required in the Albuquerque Green Building Code.

Separately, the court also considered the standard reference design aspects in relation to one preemption exception contained in the underlying statute. In the statute, one of the requirements allows an exception

> [i]f the code uses one or more baseline building designs against which all submitted building designs are to be evaluated and such baseline building designs contain a covered product subject to an energy conservation standard … the baseline building designs are based on the efficiency level for such covered product which meets but does not exceed such standard… (42 U.S.C. § 6297 (f)(3)(D))

Consequently, the court held that the exception did not apply because the higher level energy efficiency requirements served as the basis for the standard reference design.

Also involving this exception, the court considered a motion from the plaintiffs that asserted the LEED and Build Green New Mexico programs failed to qualify as well. While the applicable programs might qualify on specific products needed to attain certification, the plaintiffs failed to indicate a specific element within each program that would cause a preemption situation. Thus, the court left untouched the LEED and Build Green New Mexico aspects of the Albuquerque Green Building Code with the exception of the higher energy efficiency requirements.

2.14 BIAW v. Washington State Building Code Council

Based on a determination by the State of Washington Legislature that in excess of 30 % of the jurisdiction's greenhouse gases emanate from energy used in buildings, it directed the adoption of a new building code. In making this declaration, the

Washington Legislature stated that the "residential and nonresidential construction permitted under the 2031 state energy code must achieve a 70 % reduction in annual net energy consumption, using the adopted 2006 Washington state energy code as a baseline." With these directives in mind, the Washington State Building Council (Council, 2011, 2012) needed to review and revise the energy provisions of the state's building code to meet the new policy.

Upon revising the state's building code, the Council kept in tact the underlying mechanism that offered a litany of options for compliance. The new proposal required that a structure earn at least 1.0 credit from a list of nine options that range from 0.5 to 2.0 credits unless a computer simulation or "alternative calculation" procedure shows that the expected annual energy use of a proposed design uses less energy than a code-defined target home. Consequently, a consortium of plaintiffs challenged this action on the grounds that various federal regulations preempt the Council's new code because it required homes to have HVAC, plumbing, or water heating equipment whose efficiency exceeds the standards set forth by the federal government in applicable legislation.

In conducting its legal analysis on whether the EPCA overrides the Council's actions, the court found prima facie evidence of preemption; but it also considered the enumerated exceptions contained within the statute. Within 42 U.S.C. § 6297 (f)(3)(B), the court determined that the Council's approach did "not require use of covered products exceeding federal efficiency standards as the only way to comply with the code." Further clarifying its position with regard to preemption in situations considered as "some circumstances", the court explained that the plaintiffs "must show that under no circumstances is the Code constitutional," which did not happen in the case it was deciding.

Continuing its analysis, the court considered whether the Council's plan sufficiently offered equivalent measures and credits to the greatest degree possible with the standards set by the federal government. In evaluating the plaintiff's assertions that the Council's options did not offer equivalent measures and credits, the plaintiffs failed to persuade the court of a significant disparity in credits with the federal government's standards. This claim of needing to offer equivalent measures also included an assertion by the plaintiffs that the Council did not consider financial costs. The court explained that the applicable provision allowed for energy costs to serve as an equivalent basis, which supported the Council's approach because Congress' choice of language permitted such flexibility.

Finally, the court evaluated the plaintiff's contention that the Council's options that exceeded the federal standard did not provide a sufficient number of choices that also met the national requirement. However, this court immediately explained that the number of selections in the Council's code provided balance but that on December 22, 2010, the DOE issued a waiver of its federal preemption status for state regulations relating to the efficiency of showerheads, faucets, water closets and urinals, which eliminated most of the assertion. Moreover, the court expanded on its prior equivalency notion to reiterate that various options offered under a state plan need not correspond financially for a builder so long as the energy

efficiencies are comparable. Hence, the trial court upheld the Washington State Building Code in a Summary Judgment decision as permissible within the context of EPCA.

On appeal, the Ninth Circuit Court of Appeals reviewed the lower court's analysis and decision and repeatedly validated the opinion. The appellate opinion also distinguished the Washington State Building Code from the Albuquerque Green Building Code. The Albuquerque Green Building Code's approach left no choices for a builder and imposed significant costs on those installing products adhering to federal standards by necessitating additional equipment to meet the higher efficiency requirements. In contrast, the Washington State Building Code did not burden builders with additional costs or require the use of higher efficiency products; so it did not conflict with the federal statutes.

Hence, these two cases demonstrate how the courts will react to the adoption of more stringent building codes that attempt to elevate the energy efficiency standards as part of the policy goals for more sustainable structures. As such, the circuit split appears reconcilable on the grounds that a jurisdiction's approach to advancing its policy goals must be mindful of the national objectives laid out by Congress but can still work within the articulated framework if drafted properly and reviewed by those with knowledge of the many pertinent facets of federal law.

2.15 Conclusion

Given the contrasting styles used by state and local governments to bring forth meaningful change towards a more sustainably built environment, the courts appear willing to support the efforts made by policymakers to adopt green building standards. The opinions in both cases found preemption to exist and then looked to the enumerated exemptions under the law as a possibility for upholding the mandate. A determining factor in both cases appeared within the realm of flexibility exhibited by the two different approaches undertaken by the two codes, which provided a distinction in allowing the Washington State Building Code to survive its challenge. The underlying assumptions that used energy costs in lieu of energy consumption as well as balancing the options available for compliance reinforced the permitted exception defense as acceptable.

On the other hand, the City of Albuquerque chose to include prescriptive provisions within its approach for mandating energy efficiency and ultimately failed to fit within the statutory exemptions allowed by the preempting federal law; yet, the court declined to extend its analysis to the third party verification systems like LEED and Green Globes on the grounds that the plaintiffs failed to connect a product within the program to the federal statute. As such, the court validated the use of third party verification programs as a means to promote sustainability goals because no conflicted existed.

In light of these court decisions, those policymakers that choose to advance their sustainability goals by enacting legislation that obligate developers to include more

environmentally and energy efficient features into newly constructed structures may face many obstacles including a preemption challenge; however, these recent court decisions also reveal a willingness to accommodate the efforts by subnational governments to progress their agenda so long as the enactments offer flexible options to those affected through an internal or externally adopted standard using a supported method of calculation. Hence, the drafters of legislation that promote sustainable solutions within the built environment along with its promoters and supporters need to proceed in a diligent and careful manner if they wish to survive a preemption challenge in the courts.

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Chapter 3
An Operational Look at Take-Back Legislation

Atalay Atasu

Abstract This paper explores the gap between the principles of take-back legislation and their implementation. The discussion is based on my experience with take-back legislation implementations in Europe and in the United States, as well as my research exploring the underlying economics of take-back systems on the ground. I argue that the transposition of legislative principles into working systems can lead to an array of unintended consequences, ranging from exacerbated environmental damage to uneven competitive landscapes. I illustrate these phenomena with the help of a series of economic models, and argue that the design of environmental legislation needs to carefully take into account the economics of such practices on the ground. A natural follow-up question is to what extent such legislation should define an implementation structure. Answering this question can help legislators in identifying the correct boundaries and scope of legislation they write and environmental NGOs in strategic lobbying.

3.1 Introduction

Product take-back legislation based on Extended Producer Responsibility (EPR) has recently gained momentum across the world for different product categories from automotive to packaging, batteries, electrical and electronic waste (e-waste), and pharmaceuticals (Product Policy Institute, 2013). The basic idea behind EPR is to hold producers responsible for the environmentally friendly disposal of their products at end-of-life. The Waste Electrical and Electronic Equipment (WEEE) Directive in Europe (Directive 2003/108/EC) and The Specified Household

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Appliance Recycling (SHAR) Law in Japan (Atasu & Van Wassenhove, 2012; Tojo, 2004, 2006) are early examples of such legislation. Since 2004, 26 states in the US also passed e-waste bills, mandating producer responsibility (ETB, 2013). In Europe, there also exists similar legislation for packaging, pharmaceutical, and end-of-life vehicles (ELVs), and in the US there are recent attempts to enact take-back legislation for pharmaceuticals and leftover paint (Product Policy Institute, 2013).

The objective of such legislation is to lower the environmental impact associated with end-of-life products by reducing the amount of waste sent to landfills and to provide producers with incentives to design greener products (Lifset, 1993; Lindhqvist, 2000). The downside is the economic burden imposed not only on producers but also on consumers and local governments. Because collection and processing of end-of-life products imply a net additional cost to the economy, take-back legislation should be designed by considering its economic implications on different stakeholders. In what follows, I will try to shed light on this issue based on anecdotes from my recent interactions with practitioners.

In a recent trip, I had the chance to meet a number of stakeholders involved in crafting and implementing e-waste take-back legislation in Minnesota. The objective of this trip was to understand how perspectives differed across stakeholders in the scope of the Minnesotan electronics take-back legislation, but the end result was a valuable lesson on where things could go wrong in translating environmental objectives into a legislative implementation. That is, realized outcomes can substantially differ from what is intended by the legislation if basic competitive economics and implementation related externalities are not taken into account when crafting the legislation.

In a nutshell, the Minnesotan electronics take-back legislation (Minn. Stat. §§ 115A.1310–1330, 2007) appears to be inspired by the European WEEE Directive. The main differences are that (1) The Minnesotan legislation focuses only on monitor and screen containing devices, while the WEEE Directive covers practically all electrical and electronics devices in its scope; (2) Similar to the earlier implementations of the WEEE Directive, the Minnesotan legislation assigns proportional financial responsibility for e-waste recycling to producers, based on their market shares (i.e., the sales volume in the current year relative to the total sales in the market), however, producers are allowed to fulfill this obligation by taking-back and recycling other covered electronics (e.g., PCs or laptop computers) as well; (3) the Minnesotan legislation has much higher collection targets than those imposed by the European WEEE Directive, and allows producers to exceed those and store credits for future obligations; and (4) the producers in Minnesota are provided with the flexibility to design a market-based system where they can fulfill their obligations individually or by forming collective systems, a remedy that corrects the long critiqued collective system obligations in the earlier implementations of the European WEEE Directive. At the first glance, this appears to be an excellent legislative set-up that allows for a market-based implementation with several flexibilities. However, the good intentions in this legislative structure have led to a potentially inefficient system that can create an uneven competitive landscape.

First and probably most importantly, the flexibility provision with respect to what needs to be recycled is creating a loophole in the take-back system. That is, while the recycling obligations target CRT TVs, which constitute the majority of e-waste flows in the state and are costly to recycle, producers can instead recycle PCs or laptops to fulfill their obligations, which can generate positive margins from recycling. At the same time, the volume that has to be recycled by the producers is based on their recent sales volumes, rather than the e-waste volumes flowing into the state collection points. However, the collected e-waste volumes are significantly larger than the producers' recent annual sales, which allow producers or recyclers to be selective in what is to be recycled. In this case, one naturally prefers to recycle PCs rather than CRT containing TVs. At the same time the imbalance between the available e-waste volume and the legislated requirement is so high that some producers managed to recycle nearly 20 times more volume than their obligations (most likely with mainly PCs at no cost), and earned future credits from those. The flexibility provision as to what needs to be recycled also does not specify where e-waste volumes have to be collected. In turn, producers or recyclers have no incentive to collect from remote locations and focus their efforts to collect e-waste from easier to access central locations (i.e., largely populated counties) to incur lower costs of collection. The end result of all these externalities, allowed by the flexibility provisions in the legislation, is that the producers recycle fewer CRT TVs and remote counties do not necessarily benefit from the legislation. Essentially, in these circumstances the majority of costly to recycle products are expected to end up being paid for by the local municipalities or counties, which contradicts with the original notion of extended producer responsibility. It appears that the parties that benefit most from this outcome are the producers, for whom the average cost to recycle a pound of e-waste is less than ten cents, a significantly lower number than other states that impose different legislative rules. An example of those is the state of Washington, discussed below.

In my opinion, the Washington state electronics take-back legislation provides less flexibility in implementation. Since it has been enacted, the legislation has been operationalized by a single statewide entity known as the Washington Materials Management and Financing Authority (WMMFA), which oversees the collection and recycling of all e-waste volumes in the state. The WMMFA offers a standard plan that was the first to operate in the state, and to-date the only recycling scheme approved by the Department of Ecology. Although the legislation provides flexibility for producers to develop independent (i.e. producer operated) plans to manage their own responsibilities for e-waste recycling, no independent plan has been approved so far. Given the state-level, single entity-based operationalization of e-waste recycling; some may consider this implementation as a counter example to the legislation in Minnesota. In addition to the fact that the standard plan is the only way to comply in the state, the essential differences are that: (1) the Washington state covers monitors and computers (i.e., PCs and laptops) in products categories that are subject to producer financed recycling, and (2) it does not rely on collection targets and imposes a convenience objective. That is, any covered electronics

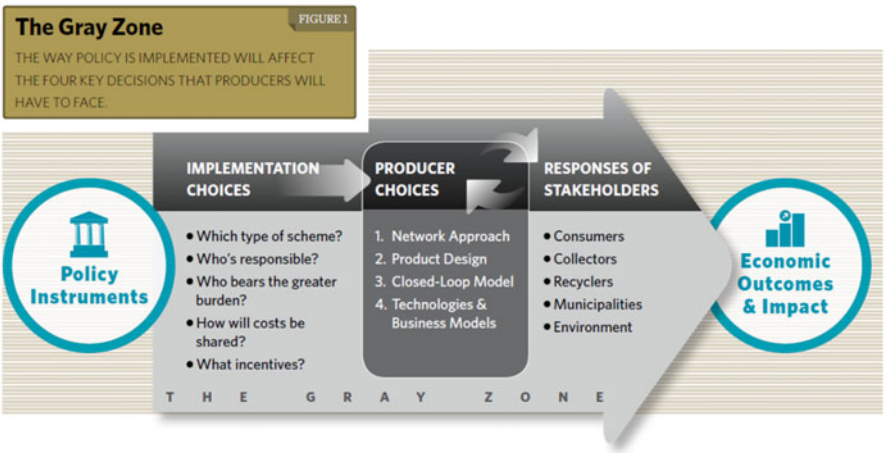

Fig. 3.1 The grey zone (Reproduced from Atasu & Van Wassenhove, 2012)

product returned to a collection location has to be recycled. More importantly, any county with a population of 10,000 or more residents needs to have at least one designated collection point that accepts used covered electronics at no charge to customers. An additional difference is: (3) the total cost of collecting, transporting and recycling e-waste is shared by producers with respect to their market shares. Note that while the Minnesotan legislation utilizes market share to determine the recycling obligation of each producer in weight, the Washington model requires collection of all collectable e-waste and utilizes market share to allocate costs among producers. Accordingly, any volume of CRTs and computer equipment are recycled through the standard plan in the state, and the convenience objective guarantees the coverage of returns from almost 99 percent of the population. The downside however, is that the economic burden is significantly higher in Washington; the per-pound average cost to recycle is about 24 cents. More importantly, there is a significant concern among the producers operational in the state with respect to the market share based cost allocation that does not differentiate between producers with respect to return volumes and product characteristics. For instance, if a producer's current market share is low and historical market share is high, this leads to a potentially unfair cost allocation. That is, even if the majority of TVs in the e-waste streams belong to a certain producer, a current low market share for the same producer implies that other producers with higher current market shares would be paying for that particular producer's recycling obligations. Similarly, the cost allocation does not differentiate between PC and TV producers with respect to their cost allocation; all pay the same unit price for the recycling of their products. This naturally raises a concern, as PC producers expect to be rewarded for the valuable commodities to be generated from the recycling of their products that contain precious metals such as gold, platinum etc. (Fig. 3.1).

They key observation from this discussion is that there exists a gap—a Grey Zone—between the principles and the implementation of environmental legislation (see also Atasu & Van Wassenhove, 2012). In other words, there is a strong likelihood that policy objectives be translated into working systems with adverse effects on the economy and the environment. For instance, it is unclear whether the Minnesotan and Washington state legislations are able to increase incentives for producers to design more environmentally friendly products or increase landfill diversion relative to the levels before they were enacted.

In this chapter, I argue that in order for a legislative implementation to serve its purpose, the legislature first needs to understand the basic economics and the underlying assumptions behind such legislation. The established assumptions behind take-back legislation are the following: first, it is assumed that the recycling of products within the scope of legislation has a net cost. That is, unless regulated, those products would not be of interest to any producer and in turn they will either be landfilled or recycled by local governments. Second, it is assumed that the costs associated with such legislation can only be reduced by designing products for recycling. In what follows, I challenge those assumptions with the help of a series of working papers I recently wrote and explore a number of externalities that result in unintended consequences from environmental legislation.

3.2 Implementation Externalities

3.2.1 Product Design

In Atasu and Subramanian (2012), we evaluated the fit between the assumptions that collective systems are more cost efficient and EPR creates incentives to design products for recycling, and managed to show that collective EPR implementations that utilize simple cost allocations mechanisms (e.g., market share or return share) undermine the design incentives. We showed that producers find lower incentives for design for recycling under collective systems with cost allocations such as return- or market-shares than under operating such systems individually. This is because cost sharing under collective systems allows for free-riding and reduces design incentives for all producers. This is potentially the most important drawback of collective systems. While it could be argued that a producer would find some design incentives for recycling irrespective of the collective or individual nature of the implementation, it shows that design improvements may be muted under collective systems because of inefficient cost allocations.

Take-Away 1: Collective systems may undermine design incentives.

As such, it can be argued that an important policy implementation choice is the cost allocation mechanism used in collective systems. This has been recognized by discussions in practice, which suggest that unless the cost allocation models in collective systems reflect the individual efforts towards design improvements, design incentives will remain moot under collective systems (Lifset, 1993; Lifset & Lindhqvist, 2008). Hence, a fundamental implementation issue is finding a cost allocation heuristic that reflects all producers' individual perspectives. In other words, we need to find a cost allocation mechanism that relates to the actual costs of dealing with producers' own products at end of their life. However, what constitutes one's actual cost is undefined in a collective system because it highly depends on the underlying network effects, i.e., the availability of resources and the optimal product routing.

To capture such network effects, we adopt a network model of a collective system in Gui, Atasu, Ergun, and Toktay (2013a), where we identify a cost allocation model that can resolve the fairness concerns associated with collective systems. To remain close to the practical implementations, we focus on identifying cost allocation mechanisms that can be presented as improvements to the return share model. We demonstrate that two types of adjustments to return share can greatly reduce or eliminate fairness and stability concerns associated with collective implementations: (1) a network based adjustment/weighing of return shares to reflect the processing cost differentials between products in a collective system; and (2) making capacity-based side payments to producers who have access to cheaper collection, transportation and processing resources.

We also propose a framework to implement the cost allocation mechanisms developed, which relies on having an impartial non-profit entity act as the system operator. The operator's role is to contract with service providers, determine the cost allocation mechanism, manage resource and cost information, maintain a cost efficient network, and charge participating producers. We also argue that this mechanism can provide incentives for producers to invest in identifying and developing cost-effective resources. A recent revision to the WEEE Directive indeed utilizes a model based on this framework to overcome the concerns with the existing implementation of the directive in the UK.

Take-Away 2: Cost allocation is a critical component of an efficient collective EPR system.

Next, assume that such a cost allocation model is implemented and producers can achieve as good costs under a collective system as they can achieve individually. Would this system continue to guarantee the best design incentives? In Gui, Atasu, Ergun, and Toktay (2013b), a recent study, we show that even under a cost allocation that is perceived to be fair, design implications of collective EPR implementations strongly depend on the level of potential network synergy in the collective system. Specifically, when the synergy level in the network (i.e., benefits from resource sharing) is sufficiently high, a collective system provides inferior design incentives than an

individual one for every producer. This is mainly because the high network synergy already significantly reduces the recycling cost allocated to each producer, rendering the cost reduction potential of product design improvements limited. However, in cases where the synergy level is low, the opposite result can be observed, i.e., a collective system provides superior design incentives than an individual one for every producer. This is due to the network setting of collective systems where products' marginal costs matter in designing fair cost allocations. In a low synergy case, although the total processing cost decreases due to the network synergies, the marginal costs of some producers may be higher. This creates incentives for more recyclable designs.

Take-Away 3: There exists an inherent cost-efficiency vs. design incentives trade-off in collective EPR implementations. Collective systems can be design efficient only if there is limited resource differentiation in the recycling market.

The discussion so far assumes that a producer, in response to EPR, can reduce the associated economic impacts by changing product designs. However, the notion of product design can take two essential forms: (1) increasing the recyclability of a product so that its recycling cost at end-of-life decreases or (2) making the product more durable, so that the recycling volume obligations associated with EPR are reduced. When these two design attributes interact and reduce the cost effectiveness of design improvements, it is not clear how EPR drives product designs the associated environmental implications. In Huang, Atasu, and Toktay (2013), another recent paper, we show that this is indeed the case. An EPR implementation with more stringent requirements first leads to an increase in the durability of products and then switches the design improvement focus to increasing the product recyclability or vice versa. An important take-away is that in order to induce truly greener designs of products that are both more recyclable and more durable, the legislative stringency of environmental objectives (e.g., collection and recycling standards) should not be set to be too high or too low.

When constructing new environmental legislation or when assessing one, it should always be kept in mind that one very important goal is to reduce the total environmental impact. Environmental legislation may work towards that goal directly or indirectly. For instance, recycling and collection targets can be assumed to directly alleviate the environmental burden by ensuring proper collection and end-of-life treatment of products. However, these targets may also indirectly induce producers to change their product designs (e.g., recyclability and durability improvements), and lead to an increase in demand and consumption, exacerbating the total environmental impact. In order to ensure that the indirect effects do not result in unintended environmental externalities, one needs to have a clear understanding of how collection and recycling targets influence a producer's incentives to design for durability or recyclability, and how durability and recyclability choices in product design influence the final total environmental impact of production and consumption.

Take-Away 4: Design for recycling is not the only design option induced by EPR-based take-back legislation. The interaction between durability and recyclability choices of products can lead to a higher environmental impact under take-back legislation.

3.2.2 Product Nature

Take-back legislation often assumes that the products of interest have reached their end-of-life and contain no recoverable value. A natural question in this context is what happens if market dynamics create some recoverable value in products that are within the scope of such legislation.

In Esenduran, Atasu, and Van Wassenhove (2013) we challenge the assumption that environmentally friendly treatment of end-of-life products is always costly and hence producers should be made responsible for collection and recycling of those. We argue that the dynamics in the commodity markets, along with advances in product design and recycling technologies may allow recyclers to generate net revenues from recycling some end-of-life products, particularly electronics. Such changes in recycling economics create a competitive marketplace for waste. That is, producers may have to compete with third parties in collecting and recycling end-of-life products to comply with take-back legislation. Hence, an important question is whether stringent collection or recycling targets necessarily lead to better environmental or economic outcomes in a competitive market for recyclable end-of-life products.

In Esenduran et al. (2013) we illustrate the following. In the absence of third-party competition, the absence of take-back legislation may induce cherry-picking, i.e., items that are more valuable and easier to recover would be collected first and the rest discarded. In this case, take-back legislation increases landfill diversion and producer incentives to design products for recycling by imposing producer responsibility for waste that would otherwise not be recycled, and in turn, it improves welfare. However, the presence of third-party competition may imply significant environmental and economic inefficiencies under EPR-based take-back legislation. We show that stringent recovery objectives may reduce the level of landfill diversion and diminish a producer's incentives to design products for recycling. In sum, when waste contains recoverable value and leads to a competitive recycling market, take-back legislation may have unintended economic and environmental consequences. Therefore, we conclude that regulatory targets should consider the recoverable value in end-of-life products and the economics of competitive recycling markets.

Take-Away 5: Stringent environmental objectives under EPR may reduce landfill diversion for products with recoverable value.

In Alev, Agrawal, and Atasu (2013), a follow up paper, we make a distinction as to whether the value in used products would come from the commodity market (i.e., from material recovery) or the remaining useful life in a product. We build on the durable goods literature to argue that the presence of EPR-based take-back legislation may provide incentives for producers to interfere with the secondary markets for used goods. To see if and how this happens, we use a stylized economic model to analyze the decisions of a durable good producer under collection and recycling obligations imposed by EPR-based take-back legislation. We assume that used products can be traded in the secondary market, and a producer can utilize used products or end-of-life products to satisfy the EPR obligations. In this case, a producer faces a trade-off between the benefits of interfering with the secondary market to fulfill EPR requirements and the increased cost of acquiring used goods. We focus on three policy levers that can be used by EPR-based take-back legislation: (1) a collection rate as a fraction of sales, (2) a recycling standard and (3) collection infrastructure requirements. Given these requirements, the producer decides on the quantities of new products to sell, used products to purchase, and end-of-life products to collect. We then analyze the effect of each policy lever on the secondary market strategy of the firm.

This analysis allows us to show that EPR does amplify a firm's incentives to interfere with secondary markets. When recycling standards are not stringent, EPR-based take-back legislation leads to the recycling of used products rather than end-of-life products. This implies that certain forms of EPR obligations for durable products may have adverse effects, such as shortened useful lives. Along similar lines, we show that stringent collection targets, recycling standards, or end-of-life collection infrastructure requirements may lead to increased production and secondary market interference. These results suggest that EPR policy may result in very different economic and environmental consequences than intended. For example, by adopting a life-cycle environmental impact perspective, one can show that more stringent EPR obligations may generate worse environmental performance depending on the relative environmental impact that used products have in different periods of their usage.

Take-Away 6: EPR may induce secondary market interference, and lead to reduced useful lives for durable products.

This idea creates additional insights by providing an international perspective regarding the economic and environmental implications of EPR. An ongoing debate in the environmental policy context is a global one: whether or not to restrict e-waste exports to developing countries. With the prevalence of landfill bans and EPR type of mandates imposed on producers, an easier and cheaper way to deal with e-waste appears to be to export e-waste to developing countries. Unfortunately, however, the poor working conditions and non-stringent recycling standards in these countries lead to major environmental and health problems for the society. As a counter measure, following an environmentalist initiative, a recent environmental law in the US (Responsible Electronics Recycling Act, 2013; *see also* Kyle, 2011) restricts the export of such e-waste into developing countries and suggests that only used products that are in re-usable condition be allowed to be exported.

In Alev et al. (2013), we challenge the premise regarding the benefits of this approach, i.e., allowing the export of reusable products to developing countries. We show that export restrictions focusing only on end-of-life products can be even more harmful from an environmental perspective. In essence, a producer that has the option to export used products can use this opportunity to weaken the competitiveness of secondary markets and avoid the potentially high recycling costs in the developed country (due to more stringent recycling requirements) by simply exporting the used products to a developing country. More importantly, this opportunity allows the producer to interfere with the secondary market at a lower cost and results in even higher sales volumes of new products. This not only results in an increase in natural resource and energy consumption in the developed country, but also in higher volumes of used product exports into developing countries, which eventually end up reaching their end-of-lives and potentially cause an even bigger environmental problem there. In sum, we suggest that partial export bans do not solve the e-waste problem at a global level. Instead, the solution to the problem lies in identifying global recycling standards to be satisfied and guaranteed by the producers themselves, irrespective of the location of recycling operations.

Take-Away 7: Export restrictions may strengthen producer incentives for secondary market interference and lead to exacerbated environmental harm both domestically and internationally.

In Alev, Atasu, Ergun, and Toktay (2013), we focus on a specific category of non-durable products, i.e., consumables. In particular, we focus on EPR implementations for unused pharmaceuticals, a category of products of a consumable nature. Studies indicate that nearly half of the prescription drugs dispensed each year in the US go unused, resulting in over one billion dollars' worth of drug surplus (Simons, 2010)

with potential adverse environmental and health impacts such as unintentional poisonings, substance misuse or abuse (CDC, 2013; Drug Free, 2013; Take Back Your Meds, 2013). Consequently, practices that limit the release of pharmaceuticals to the environment are desired by society, leading to calls for EPR-based drug collection programs (Pollock, 2012; Simons, 2010). The feasibility or appropriateness of EPR programs for pharmaceuticals, however, is not clear due to significantly different characteristics of the pharmaceutical supply chain and the nature of pharmaceutical products. In particular: (1) The causes of surplus and the nature of demand for pharmaceuticals are unique due to the patient-doctor interaction; (2) Marketing and promotional efforts are directed at both the patient and the doctor; (3) Pharmaceuticals are consumable and perishable; (4) Insurance coverage and policies impact demand; and (5) Incineration (rather than value recovery) appears to be the primary post-use disposal option.

Accordingly, we develop a framework to analyze the economic implications of EPR programs for pharmaceuticals. Building on a large body of literature from diverse fields, we build a stylized game theoretic model between a policy maker, a producer, a doctor and a heterogeneous patient base. In this model, the policy maker can choose to operate the EPR system by taxing the production (i.e., a state-operated system) or allocate the operational responsibility to the producer by imposing a collection and processing rate on the producer (i.e., producer-operated systems). Given the policy choice, the producer sets the price and promotional efforts directed at the doctor and the patient; the doctor decides on the prescription amount that maximizes her utility by considering the health of the patient, promotional effects and her reputation; and the patient makes his consumption decision.

Defining the impact level of a medicine as a function of its treatment benefit and potential over-prescription disutility, we show that the producer- (state-) operated EPR implementations should be preferred for low (high) impact prescription medicine. This result contradicts the results of a similar analysis in the context of non-consumable goods (see Atasu, Özdemir, & Van Wassenhove, 2013), which would suggest that state-operated systems should be preferred in a similar setting. We show that this reversal in policy preferences is due to the consumable nature of the pharmaceuticals and the complexity of interactions between the stakeholders in the pharmaceutical industry. We also show that these results can be extended to include the perspectives of insurance companies. In sum, by analyzing the additional complexities and unique interactions in the pharmaceutical industry, we find that experiences and well-established premises learned from EPR implementations for non-consumable goods do not necessarily hold for consumables such as pharmaceuticals. Identifying ideal EPR implementations for pharmaceuticals require a careful investigation.

Take-Away 8: EPR for consumables may require a completely different perspective in implementation.

3.2.3 Competition

EPR implementations should take into account the type and intensity of competition in the market.

The first observation in this context comes from Atasu, Van Wassenhove, and Sarvary (2009), where we show that the stringency of EPR based legislation should be increasing in the degree of competition in the product market. The underlying cause of this result regards how the elements of welfare change under competition. When the intensity of competition increases, the optimal product prices go down. Due to lower prices in the market more consumers buy the product, increasing the output. Thus, while the consumer surplus is increasing, producer profits and the environmental benefits are decreasing in the intensity of competition. The negative environmental impact of competition can be overcome if legislation adjusts the recovery targets to the level of competition. Increased environmental stringency in legislation implies higher costs to the producers and higher prices for the consumers. This helps the environment by reducing the output and the proportion of output that remains as waste. To summarize, we suggest punishing the producers more when there is tougher competition.

Take-Away 9: Competition in the product market requires more stringent EPR implementations.

In Atasu and Subramanian (2012), a follow up paper, we demonstrate that the averaging of recovery costs under collective EPR implementations allows certain producers to free-ride on others' investments in design improvements. The identity of free-riders under collective EPR implementations depends on how average recovery costs are calculated. Through a comparison of two average recovery cost calculation models (i.e., exogenous and endogenous weights on the producers' respective unit recovery costs), we show that when average recovery cost calculations are based on the actual mix of products recovered by the collective system, the producer with the lower sales quantity (or lower waste volume) may free-ride on the other's design improvements. However, when the average recovery cost does not reflect the actual mix of products but is based on an assumed product mix, this result can change. For instance, if the marginal recovery cost charged by a collective system is a simple average of the high- and low-end producers' recovery costs, we predict that a low-end producer would improve its design more than a high-end producer, allowing the high-end producer to choose a lower design improvement level. Thus, the average recovery cost calculation in a collective system is closely linked to design improvement choices and free-riding incentives.

In Esenduran et al. (2013), we show that third party competition in the markets for waste collection and recycling also has important implications on the efficiency

of EPR implementations. When such competition in the market is sufficiently strong to drive producers to strategically increase the price they pay to acquire waste, the total landfill diversion level in the market may go down. When waste has value, higher landfill diversion levels can be achieved either by imposing very stringent recovery targets on producers, or by relatively dampened recovery targets that let the competitive marketplace manage landfill diversion on its own. At the same time, third party competition has implications for EPR's design incentives. In Esenduran et al. (2013), we also show that stringent recovery targets diminish a producer's incentives to design products for recycling. This requires third-party competition deterrence, and suggests that producers will find an incentive to not design products for recycling so that third-parties do not enter the waste market. As such, enforcing stringent recovery targets can be harmful from an environmental perspective.

In sum, in Esenduran et al. (2013), we suggest that when waste has value, achieving the two environmental goals of take-back legislation, i.e., higher landfill diversion and superior incentives to design for recycling, requires a different approach for EPR implementations. That is, in the presence of competition for valuable waste, producer responsibility may need to be relaxed to soften competition in the market place. Lower recovery targets imposed on producers may not only improve landfill diversion and incentives to design for recycling, but also the economic components of the welfare equation. This approach can help prevent third-parties from reducing their coverage levels to avoid competition with producers.

Take-Away 10: Competition in the waste market requires less stringent EPR implementations.

3.3 Conclusions

As legal academics and practitioners surely understand, the devil is in the details. As such, what I highlight in the discussion above is the criticality of the underlying operational details and associated economics of environmental legislation, and in turn, the gap between intentions and realized outcomes of many EPR implementations. In essence, the above discussion suggests that if legislation is to be prescriptive, it should carefully analyze:

1. The incentives for product design improvements.
2. The nature of the product of interest: Is it a durable or consumable product? Is there value in material recovery? Is there a functional secondary market for used products?
3. The type of competition in the market: How intense is the competition in the product market? Is there competition for waste?

Based on the discussion so far, the following principles summarize the implications of design, competition, or product nature related externalities on the efficiency of EPR-based take back legislation.

1. Collective systems may undermine design incentives.
2. Cost allocation is a critical component of an efficient collective EPR system. A prescriptive legislation should identify a proper cost allocation model to achieve its desired objectives.
3. There exists an inherent cost-efficiency vs. design incentives trade-off in EPR implementations. Collective systems can be design efficient only if there is limited resource differentiation in the recycling market.
4. Design for recycling is not the only design option induced by EPR-based take-back legislation. The interaction between durability and recyclability choices of products can lead to a higher environmental impact under such legislation.
5. Stringent environmental objectives under EPR may reduce landfill diversion for products with recoverable value.
6. EPR may induce secondary market interference, and lead to reduced useful lives for durable products.
7. Export restrictions may strengthen producer incentives for secondary market interference and lead to exacerbated environmental harm both domestically and internationally.
8. EPR for consumables may require a completely different perspective in implementation.
9. Competition in the product market requires more stringent EPR implementations.
10. Competition in the waste market requires less stringent EPR implementations.

These principles and the associated discussion lead to but one critical observation: product design, nature or competition related externalities can be dynamic and take any shape over time and the realization of these externalities can lead to unintended environmental and economic outcomes from take-back legislation. Hence, it is hard to find an ideal/universal solution or a generic framework approach for take-back legislation implementations. Consequently, it appears that the right approach for such legislation is to not go beyond the principle, and provide flexibility in implementation. This would not only allow the system on the ground to adapt to the market dynamics over time, but also correct flaws in legislature assumptions after the legislation has been enacted.

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Chapter 4
Subsidizing Sustainability: The Role of the State and Civil Society in Implementing Wal-Mart's Local Produce Sourcing Program

J. Dara Bloom

Abstract Theories of governance remind us that even in the context of neoliberal political economic governance, the state still has a role to play in facilitating the conditions that create the free market, as well as in participating in new types of arrangements that have formed to address the challenges of regulating global economic spheres. Often referred to as hybrid governance, these new arrangements blur the traditional responsibilities of actors from the public and private sectors, as well as from civil society. This chapter draws on theories of hybrid governance to analyze how the Wal-Mart Corporation implements its sustainability initiative in the agri-food system by drawing on the resources and activities of public and non-profit organizations. Based on qualitative research that includes a content analysis of Wal-Mart's publicly available documents, as well as fieldwork in both the US and Honduras, this chapter demonstrates how state policies and programs facilitate the implementation of Wal-Mart's sustainability initiative, which in the agri-food system takes the form of local produce sourcing. As an illustration of the role of the nation state in the present era of neoliberal globalization, this chapter demonstrates both how national policies created the conditions for the emergence of Wal-Mart as a powerful player in the food retailing industry, domestically and internationally, and how the state plays a role in the implementation of Wal-Mart's programs, often through public/private partnerships. This chapter finds that relationships between Wal-Mart and public and non-profit organizations allow the company to outsource the costs, risks and responsibilities of developing local supply chains. Therefore, Wal-Mart's sustainability program relies on public subsidies to operate. This chapter considers the implications of public subsidization of a transition to sustainability in the context of corporate sustainability initiatives.

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4.1 Introduction

Corporate sustainability programs are often seen as the epitome of self-regulation by the private sector and free market, as described by the tenets of neoliberal governance (Gond, Kang, & Moon, 2011). In this context, much research has documented the growing power and influence of supermarket retailers on global conditions of production, distribution, consumption, highlighting specifically how, in many instances, forms of corporate governance and market mechanisms have become more influential than state-based regulations (Konefal, Mascarenhas, & Hatanaka, 2005; McMichael & Friedmann, 2007; Wrigley, Coe, & Currah, 2005). This is true, for example, for private sustainability standards, which are described as regulatory mechanisms that allow retailers to impose their version of sustainability on production practices while outsourcing costs, often superseding or replacing weak regulations in the countries where they operate (Bain, Deaton, & Busch, 2005; Berdegué, Balsevich, Flores & Reardon, 2005; Busch & Bain, 2004; Fuchs, Kalfagianni, & Arentsen, 2009; Raynolds, Murray, & Heller, 2007).

However, theories of governance remind us that rather than becoming irrelevant, under neoliberalism the nation state's role has shifted to facilitating the conditions that create the self-regulating market in order to foster private governance (Cheshire & Lawrence, 2005; Falkner, 2003; Spaargaren, Mol, & Bruyninckx, 2006; Stevis & Bruyninckx, 2005). Rather than assuming that corporate governance replaces or supplements the role of the state, this chapter explores the shifting relationships among corporations, states and civil society in order to highlight the role of public policies, partnerships and programs in facilitating corporate governance of the agri-food system. Taking the Wal-Mart Corporation's sustainability initiative as an example, this chapter applies theories of governance from the field of political economy to qualitative fieldwork in order to analyze the company's local produce sourcing program in both the United States and the Central American country of Honduras. Focusing specifically on theories of hybrid governance, which describe how roles and responsibilities are allocated and often shared between different sectors of society, this research demonstrates how Wal-Mart is able to promote its sustainability efforts while outsourcing costs and risks through an emphasis on public/private partnerships that are implemented by organizations from civil society. Therefore, Wal-Mart's local produce sourcing program essentially relies on public subsidies, which allow it to externalize the costs of implementing sustainability in its operations. This chapter will analyze the policy implications of these hybrid governance arrangements by addressing the question of who should ultimately pay the costs for transitioning to sustainability. While public subsidies to support desired practices may be appropriate, it is argued that the oligopolistic nature of the supermarket industry, and the relative power of the Wal-Mart Corporation, may skew the effects of these subsidies toward a corporate version of sustainability. Therefore, a strong state is needed to ensure that public/private partnerships work towards the common good.

This chapter will begin by presenting political economic theories of governance, and particularly hybrid forms of governance, before turning to background about how

state-based regulations formed the basis for the growth and international expansion of Wal-Mart, which now dominates the supermarket retailing sector. This historical review will highlight the previous role of state regulations in fostering concentration in the supermarket sector, as well as the involvement of corporations in policy-making, in order to lay the groundwork for analyzing hybrid governance arrangements in Wal-Mart's local produce sourcing program. After a brief note on my methods, I will analyze primary data to consider the consequences of how Wal-Mart's local sourcing program is facilitated by state policies and programs in both the US and Honduras, and finally will conclude by commenting on the implications of the public subsidization of corporate governance for sustainability in the agri-food system.

4.2 Conceptualizing the Role of the State and Civil Society in Corporate Sustainability: Theories of Hybrid Governance

Political economic theories of governance, and specifically hybrid governance, serve as a powerful lens to analyze the role of the state in facilitating Wal-Mart's sustainability initiative. To begin more broadly, the theoretical foundation of governance derives from the recognition of the distinction between the concepts of *government* and *governance*, in that there are certain, "…institutions, procedures, analyses…[and] tactics," (Foucault, 1991, p. 102) that are used in the exercise of power, and that while these may have traditionally been executed by the political institution of the government, they are not confined to it (Jessop, 1995; Spaargaren et al., 2006; Stevis & Bruyninckx, 2005). As Spaargaren et al. (2006) explain, "This transition from government to governance is based on the understanding that the political is not limited to the traditional concept of the state, in the sense of a delineated institution," (p. 12). Using governance as a theoretical anchor is particularly helpful in the context of globalization and neoliberalism. The exact definition of neoliberalism is often debated. Theorists have pointed to the divergent forms that such political/economic processes take as they are refracted by local contexts and institutions, illustrating the difficulty of developing one precise definition (Glenna & Mitev, 2009; McCarthy, 2006; McCarthy & Prudham, 2004; Moore, Kleinman, Hess, & Frickel, 2011). However, neoliberalism is most often described as having originated in the economic theories proposed by Milton Friedman, and put into practice by the Reagan and Thatcher administrations in the US and UK, respectively (Glenna & Mitev, 2009; Harvey, 2000; McCarthy & Prudham, 2004). In addition, neoliberalism and globalization have been mutually reinforcing, as the decline of US manufacturing industries in the face of foreign competition led many corporations to outsource production to countries with lower wages and fewer regulations, a shift fostered by trade liberalization that forced a reduction in protectionist policies in these countries (Moore et al., 2011; Portes, 2000). These conditions led to a dismantling of the Keynesian welfare state and a rebirth of liberal economic

theories that posit that state interference only limits the ability of the self-regulating market[1] to efficiently distribute social welfare outcomes (Glenna & Mitev, 2009; McCarthy, 2006; Portes, 2000; Salamon, 1987).

As the economic system became more globalized and transnational corporations' supply chains crossed national boundaries, it became increasingly difficult for any single nation state to monitor and regulate corporate activities (Bonanno, Busch, Friedland, & Gouveia, 1994; McMichael, 1996; Spaargaren et al., 2006). As a result, supranational institutions, such as the World Trade Organization (WTO) and International Monetary Fund (IMF), were formed to guide and regulate global governance (Busch & Bain, 2004; Cheshire & Lawrence, 2005; McCarthy, 2005). Governance in neoliberalism was therefore shifted in part to this supranational level, and was simultaneously devolved to local governments and communities (McCarthy & Prudham, 2004). Civil society also took on an important role, as nonprofit organizations stepped in to provide public goods in the face of any market failures[2] (Brinkerhoff, 2007; Falkner, 2003; Gareau & DuPuis, 2009; McCarthy, 2006; Spaargaren et al., 2006). Overall, this reliance on the self-regulating market tends to prioritize and protect the role of corporations in global governance, while the expectation that civil society will monitor and buffer against market failings vastly changes the role of government in governance.

As a result of these changes in global governance, Corporate Social Responsibility (CSR) programs have emerged as a preferred way for corporations to regulate the social and environmental impacts of their operations. Researchers often see these CSR programs as filling a void left by a weak state, as an attempt to pre-empt state-based regulation, or as a way to placate shareholders and consumers (Cashore, Auld, & Newsom, 2003; Conroy, 2007; Esty & Winston, 2006; Freidberg, 2004; Fuchs, Kalfagianni, & Havinga, 2011; Gond et al., 2011; Hughes, 2005). In this context, it has been argued that the state has not become irrelevant, but rather that its new set of responsibilities include facilitating the politics and policies of neoliberalism in

[1] The terms "free market" and "self-regulating market" reflect liberal and neoliberal economic *laissez faire* perspectives that the market operates independently and efficiently without state interference (Smith, 1925). However, Polanyi (1944) describes a "double movement," first towards reliance on the self-regulating market, and then a countermovement as society must protect itself from the negative effects of relying on the market to provide public goods. The term "self-regulating market" is therefore used in this chapter to refer to the market that, while maintained by state policies, nonetheless eschews state interference and this countermovement of social regulation.

[2] In the context of liberal and neoliberal economic theories, market failures are seen to occur when the self-regulating market fails to distribute resources and benefits efficiently (Bator, 1958; Mendell, 1989; Randall, 1983; Salamon, 1987). While the self-regulating market is often seen as creating the conditions to promote social welfare and create public goods, other theorists believe that the market will always create social inequalities and disruption, hence the need for state regulations in neoclassical economics, or civil society organizations in neoliberal economics (Mendell, 1989; Polanyi, 1944; Salamon, 1987). At the same time, the conditions that constitute "market failures" are also socially constructed and perceived. For example, the exclusion of small-scale producers from international agricultural markets, and their subsequent migration from rural areas to take on manufacturing jobs in industrialized zones, can be viewed alternately as the market working efficiently or as a negative repercussion of the market that needs to be redressed (Busch, 2010).

order to create the conditions necessary to foster devolution, maintain market-based regulation and promote capital accumulation (Cheshire & Lawrence, 2005; Constance & Bonanno, 2000; Falkner, 2003; Marsden, 2010; Spaargaren et al., 2006; Stevis & Bruyninckx, 2005). For example, while CSR appears as self-regulation, corporations also tend to enroll state and civil society organizations and institutions to facilitate this process (Constance & Bonanno, 2000; Gond et al., 2011; Hughes, Buttle, & Wrigley, 2007; Klooster, 2005).

This has led many to describe the result of shifts in global governance as "hybrid," in order to recognize the blurring of the distinct categories of the state, market and civil society, and the interchangeability of roles and responsibilities between actors in these sectors (Falkner, 2003; Jessop, 1995; Spaargaren et al., 2006; Stevis & Bruyninckx, 2005). Hybrid governance also describes arrangements where state, market and civil society actors form collaborative alliances in the performance of governance roles, for example, in the case of public/private partnerships (Bäckstrand, 2006; Pattberg, Biermann, & Chan, 2012; Schäferhoff, Campe, & Kaan, 2009) and in the creation and enforcement of private standards (Bitzer, 2012; Constance & Bonanno, 2000; Klooster, 2010; Raynolds et al., 2007). While some argue that the participation of civil society organizations improves the legitimacy and effectiveness of hybrid governance arrangements, others argue that such arrangements are undemocratic and ultimately prioritize the interests of powerful corporations (Bäckstrand, 2012; Falkner, 2003; Fuchs et al., 2011; Gond et al., 2011; Schäferhoff et al., 2009). These issues suggest the need to examine the role of the state and civil society in hybrid governance arrangements that promote corporate sustainability programs. In order to set the stage for how these theories are reflected in Wal-Mart's sustainability initiative, I next turn to describing how domestic and international state-based neoliberal policies facilitated the concentration of the supermarket retailing industry, leading to the emergence of Wal-Mart as the largest supermarket retailer in the world.

4.3 State Policies and the Retailing Industry: The Growing Influence of Wal-Mart

A large body of literature describes the increasing power and dominance of supermarket retailers over the global agri-food system (Burch, Dixon, & Lawrence, 2013; Busch & Bain, 2004; Freidberg, 2004; Hendrickson & Heffernan, 2002; Konefal, Bain, Mascarenhas, & Busch, 2007; Reardon, Timmer, Barrett, & Berdegué, 2003). In the US, as the first supermarket chains developed in the early part of the twentieth century, federal and state level legislation was passed to control prices in order to protect small-scale "mom and pop" stores (Levinson, 2011; Lichtenstein, 2009). The repeal of this legislation in the 1950's facilitated the growth of national chain stores, including Wal-Mart, which was founded in 1962 (Lichtenstein, 2009). Growth and concentration in the food retailing sector was further accelerated by the Reagan-era relaxation of anti-trust legislation (Wrigley, 2002). In addition, food retailing companies engaged in a series of mergers, technological innovations and changes in supply chain management that shifted control away from the then-dominant

food manufacturers (Wrigley, 2002). With its development of the supercenter format in 1988, which added a grocery division to its original store layout, and the introduction of innovations such as the bar code and its proprietary database, Wal-Mart is widely acknowledged as having led the "retail revolution" that shifted the landscape towards the dominance of a handful of powerful retailers[3] (Gereffi & Christian, 2009; Lichtenstein, 2009; McMichael & Friedmann, 2007).

Wal-Mart became the largest food retailer in the US in 2003, and as US and European markets became saturated, many of the largest supermarket chains started to expand into international markets, increasing their share of the retailing sector in developing countries at an extraordinarily rapid rate (Minten & Reardon, 2008). This was due in part to pressure from the US government and structural adjustment programs imposed by the International Monetary Fund (IMF) that led developing countries to make changes in Foreign Direct Investment (FDI) laws. These changes in FDI regulations followed trade liberalization policies of the 1980s, and were often part of the development of the regional free trade areas that are one of the trademarks of neoliberal governance (Reardon & Berdegué, 2002; Reardon et al., 2003). For US-based corporations, these policy changes made Latin American countries, in particular, an attractive investment opportunity for supermarket retailers (Reardon et al., 2003).

As a result of these state and international policies, supermarket retailers emerged as powerful actors within the US and internationally. Because of this, they have been able to participate in policy creation, while their own internal regulations are arguably more influential than state-based regulations in many instances. For example, supermarket retailers played a role in the development of the North American Free Trade Agreement (NAFTA); as Chavez (2002) notes:

> …retailers gained access to privileged information on both sides of the border. Members of the chambers and associations were invited by their governments to take part in the negotiating commissions representing their sector and members… Many retailers thus had access to the official tri-national agendas, proposals and negotiating frameworks. Many of them represented corporations that would be affected by the new regulations, so they had an opportunity during the period of negotiations to look for the best accommodation of their company's interests. (Chavez, 2002, p. 505)

In addition to participating in legislation such as NAFTA, as a result of their growing influence supermarket retailers' internal programs are arguably more influential than state policies when it comes to issues of sustainability, since "… retailers individually and collectively share an increasing responsibility for the delivery of public policy," (Marsden, 2004, p. 487). Wal-Mart, specifically, is a corporation that has embraced and promoted the self-regulating market over government regulations through its political lobbying, philanthropic endeavors and corporate culture (Lichtenstein, 2009). For example, after Hurricane Katrina, many

[3] Wal-Mart is the largest supermarket in the world by both sales and market share, followed by Carrefour (based in France), Tesco (based in Great Britain) and Metro (based in Germany); these four companies have operations throughout the world, including Central and South America, India and China (Hendrickson & Heffernan, 2002; Loeb, 2013; Lord, 2006).

noted that Wal-Mart's leveraging of its logistics capabilities enabled the company to respond to the disaster more quickly than government agencies, an impression that Wal-Mart makes an effort to advertise, and which helped to guide the company's CSR efforts (Lichtenstein, 2009). In addition, because of its size, Wal-Mart's internal labor practices and its management of its extensive supply chains have a profound impact on the economic and social conditions of millions of people both within the US and internationally, leading Lichtenstein (2009) to comment that, "In an era of weak government regulation, Wal-Mart management may well have more power than any other entity to 'legislate' key components of American social and industrial policy," (p.8). Looking beyond its internal labor practices and ability to shape consumer demand, because of the large volume of products that Wal-Mart moves through both its agricultural and manufacturing supply chains, its sourcing practices and private standards are often more influential than state-based regulations in the countries where it has stores and supply chain relationships (Konefal et al., 2005; Lichtenstein, 2006; Wrigley et al., 2005).

One important example of supermarket retailers' general influence over the agri-food system through private standards is in the area of food safety. Though traditionally the responsibility of the nation-state, in the face of growing consumer concerns after numerous food safety scares in the 1990s, a group of European retailers created a private standard that is now known as Global GAP (Good Agricultural Practices).[4] Although these food safety standards are private, in that they were initiated by supermarket retailers and are most often enforced through third party certifying agencies, they can also be considered a form of hybrid governance due to the participation of government and NGO representatives in the early stages of development, and their continued participation as associate members (GlobalGAP, n.d.; Marsden, Lee, & Thankappan, 2010). In addition to monitoring microbial contamination, these standards were also designed to include elements of sustainability, such as labor standards and animal welfare, although it has been argued that these aspects are comparatively weakly defined and enforced (Bain, 2010b; Campbell & Le Heron, 2007). In this way, Global GAP demonstrates how corporations can utilize private standards to protect their own reputations and outsource costs onto third party certifiers; at the same time, this form of corporate governance is facilitated by governmental participation. In addition, corporate implementation of Global GAP is often justified by the fact that state-based food safety regulations are often weak or non-existent in developing countries (Campbell, 2005).

Despite the fact that supermarket retailers, and Wal-Mart in particular, have gained so much influence over issues of global governance, including sustainability, the theories of hybrid governance described above suggest that it is inaccurate to assume that these companies and their private standards have completely supplanted the role

[4] Originally these standards were called EurepGAP, but the name was changed in 2007 to reflect their increasingly global influence, including the participation of US-based corporations such as Wal-Mart, Wegmans and McDonalds (Bain, 2010a; Campbell, 2005; "EUREPGAP," n.d.). Today, GlobalGAP is the most popular form of food safety certification with over 100,000 producers certified worldwide ("GlobalGAP," n.d.).

of the state. Instead, it is important to examine the new forms of policies and regulations that states use to participate in global governance, including their facilitation of corporate sustainability initiatives. In order to understand this shifting role, I next describe Wal-Mart's sustainability initiative, and highlight how the implementation of this initiative, and the company's local produce sourcing program in particular, relies on the support of state and publicly funded civil society organizations.

4.4 Wal-Mart's Sustainability Initiative: Local Procurement and Public/Private Partnerships

Wal-Mart's sustainability initiative encompasses both its US and international operations. Wal-Mart's initial focus on sustainability is widely attributed to then-Wal-Mart CEO Lee Scott's 2005 speech to shareholders that described his plan for redefining corporate responsibility and leadership in environmental terms (Esty & Winston, 2006; Scott, 2005). Wal-Mart's sustainability initiative began with an emphasis on its manufacturing supply chains, including efforts to monitor greenhouse gas emissions and labor practices, reduce packaging, and promote sustainable products and renewable energy; in addition, Wal-Mart initiated an industry-wide effort to develop sustainability standards for all of its products (Conroy, 2007; Esty & Winston, 2006; Gereffi & Christian, 2009; 2012 Walmart GRR—Goals in Progress/Products, 2012; Walmart Announces Sustainable Product Index, 2009). As suggested by theories of governance, Wal-Mart's sustainability projects have been supported through partnerships with major NGOs, such as the Environmental Defense Fund (EDF), as well as through public/private partnerships with the US government, both domestically and internationally (First Lady Michelle Obama Announces Collaboration with Walmart in Support of Let's Move! Campaign, 2011, *Testimony of Ronald G. McCormick*, 2012; Gereffi & Christian, 2009; USAID, Walmart Join Forces to Help Small Farmers and Enhance Food Security in Central America, 2011). In 2010, Wal-Mart announced sustainability goals for its agri-food supply chains. These goals focus primarily on local sourcing as the means to achieve sustainability. Therefore, before exploring the contours of these partnerships, and the role of state policies in facilitating this initiative, it is important to describe how Wal-Mart envisions sustainability for the agri-food sector, including the debated relationship between sustainability and localization.

4.5 Localization Versus Sustainability

By focusing on local sourcing, Wal-Mart draws on a vision of sustainability for the agri-food system that promotes local food and shortened supply chains as way to achieve social and environmental benefits (Feagan, 2007; Feenstra, 1997; Renting,

Marsden, & Banks, 2003), while also contributing to a development paradigm that addresses rural poverty by connecting producers with markets (Markelova, Meinzen-Dick, Hellin, & Dohrn, 2009; McMichael, 2004; Stonich, 1991a). In the US, the emergence of the local food movement has been described as a reaction against the increased globalization and corporate control of the conventional food system (Allen & Hinrichs, 2007; Hinrichs, 2003), as well as a response to the perceived co-optation of the organic movement through government standards and increased participation by large corporations (Delind, 2006; Guthman, 2007). Proponents of local food systems believe that embedding commercial transactions around food and agriculture in the environmental and social contexts of particular places will support more sustainable agricultural practices and more socially equitable outcomes for small-scale farmers (Allen & Hinrichs, 2007; Feenstra, 1997; Kloppenburg, Hendrickson, & Stevenson, 1996). Part of the perceived benefits of local food systems also comes from shortening supply chains to allow for more direct relationships between producers and consumers (Ilbery & Maye, 2005; Kirwan, 2006; Renting et al., 2003) and to decrease carbon emissions by reducing "food miles" (Jackson, Ward, & Russell, 2006; Kloppenburg et al., 1996).

Critics warn against the direct conflation of localization with sustainability, drawing into question the use of food miles as a simplified metric for the complex issues underlying environmental sustainability (Coley, Howard, & Winter, 2009; Edwards-Jones et al., 2008; Mariola, 2008), and the assumption that any particular type of production practices and social relationships are inherent in "local" contexts (DuPuis & Goodman, 2005; Hinrichs, 2003; Winter, 2003). Instead, research has shown that local food initiatives can be unaffordable and inconvenient for low-income consumers, and often fail to address labor and other social issues (Allen, FitzSimmons, Goodman, & Warner, 2003; Guthman, Morris, & Allen, 2006; Hinrichs & Kremer, 2002; Hinrichs, 2003). Despite these criticisms, however, the local food movement has only continued to grow over the past years, and in a national survey in 2010 over 80 % of US consumers reported having bought locally grown produce (Onozaka, Nurse &, Thilmany McFadden, 2010).

In comparison, in the international context, Wal-Mart's emphasis on enhancing producer access to markets by developing its domestic supply chains is more in line with the trajectory of the development paradigm, which has shifted from promoting development through self-sufficiency, to export agriculture, and back once again to self-sufficiency (Boyer, 2010; Schortman, 2010; Stonich, 1991a). While early post-war development theorists posited the importance of national level self-sufficiency in food production, as neoliberal strategies gained ground development projects shifted to non-traditional export crops as the means to reduce poverty (Boyer, 2010; McMichael, 2004; Stonich, 1991a). In Honduras specifically, export-oriented development strategies intensified in the 1980s, accelerating the integration of small-scale producers into regional and international supply chains, while also leading to the displacement of many peasants and undermining previous state-led agrarian reforms (Boyer, 2010; Edelman, 2008; Stonich, 1991a, 1991b). As a result, these policies increased urbanization and income inequalities while reducing the

production of basic grain crops for domestic consumption, which, combined with the dynamics of international markets, has made Honduras dependent on food imports from other countries[5] (Boyer, 2010; Stonich, 1991a, 1991b).

More recently, development agencies have begun to turn away from non-traditional exports to focus on domestic markets. As supermarket retailers have expanded within Latin America, there has been a growing recognition of the size of domestic markets, which by some estimates are 2–3 times larger than the exports leaving this region (Reardon & Berdegué, 2002). This has provoked interest in the opportunities that these domestic markets present to small-scale producers (Michelson, 2013; Reardon & Berdegué, 2002; Reardon & Timmer, 2007). In addition, improving their supply networks within these countries facilitates supermarket expansion, and their ability to compete with traditional markets on prices for fresh fruits and vegetables (Hawkes, 2008; Minten & Reardon, 2008). While little research has been conducted on supermarkets' domestic sourcing in developing country markets, earlier research on this market-based development paradigm has suggested the possibility that it will increase income inequalities and impede the ability of smaller-scale producers to participate (Bitzer, 2012; Bolwig, Ponte, Du Toit, Riisgaard, & Halberg, 2010; González & Nigh, 2005; Kay, 2006).

4.6 Wal-Mart's Local Procurement Program and Public/Private Partnerships

Due to the different connotations of "local" in the US and Honduras, Wal-Mart's local sourcing program takes on different forms in these two countries. In the US, the company's focus on local sourcing dates back to 2008, when it declared that it would purchase $400 million worth of local produce in that year (Walmart Commits to America's Farmers as Produce Aisles Go Local, 2008). In 2010, Wal-Mart came out with specific sustainability goals for its agri-food supply chains, including one goal for the company's US operations: "…*double* its sale of *locally sourced produce* and increase its purchase of select U.S. crops," by 2015 (emphasis in original; Walmart Unveils Global Sustainable Agriculture Goals, 2010). In 2012, Wal-Mart reported a 97 % increase in sales of local produce (defined as bought and sold within the same state) between 2010 and 2012, thereby nearly achieving its goal three years early (2012 Walmart GRR—Goals in Progress/Products, 2012). Critics have suggested that these gains don't reflect increased sourcing, but rather that Wal-Mart has started to track what it purchases locally, including purchases from large-scale farms, thus raising questions about the definition and meaning of "local" produce in the corporate context (Prevor, 2008).

[5] Despite these trends, Honduras has higher rates of agricultural employment (36.3 % of its population in 2005) and lower rates of urbanization (50.6 % of the total population in 2010) than most other Central American countries (Edelman, 2008).

For its international markets, Wal-Mart's 2010 sustainability goals for the agri-food sector included improving market access for small to mid-sized producers by "*selling $1 billion* in food sourced *from 1 million small and medium farmers*" by 2015 (emphasis in original; Walmart Unveils Global Sustainable Agriculture Goals, 2010). This goal includes providing training to small-scale producers in "sustainable farming practices" and increasing their incomes by 10–15 %. As of its 2012 Global Sustainability Report, Wal-Mart was still developing metrics to be able to evaluate its progress towards meeting these goals (Global Sustainability Progress, 2012). However, as Walmart expands in developing countries such as China and India, it has made reference to using its initiative in Central America, *Tierra Fértil*, as a model for increasing the participation of small to mid-sized producers by providing them with access to technical assistance and training (2012 Walmart GRR—Global Direct Farm, 2012, 2012 Walmart GRR—Sustainable Agriculture, 2012).

In the US and Honduras, Wal-Mart has entered into public/private partnerships to implement its local sourcing program. In the US, Wal-Mart has focused specifically on the Delta States Region as an area where it can collaborate with other actors to foster small-scale agricultural production by minority, low-resource farmers (Walmart Locally Grown, 2012). As part of this special project, Wal-Mart has met with representatives from the USDA, 1890 Historically Black Land Grant Universities and a private, third party handling company to develop strategies to provide resources and infrastructure to farmer cooperatives in this region (Walmart local sourcing expert testifies before Senate Agriculture Committee, 2012). As explained on the Wal-Mart website, "Walmart partnered with Tuskegee University and the USDA to identify local growers and better understand the barriers they face in gaining market access to retailers like us…This truly is a win-win-win," (Walmart Locally Grown, 2012). In addition, the Walmart Foundation has helped to fund Small Farmer Intensive Training Workshops in conjunction with government agencies such as the USDA, the Natural Resources Conservation Service (NRCS) and the Farm Service Agency (FSA), as well as non-profit organizations and Universities, to provide small producers with information about how to organize, access resources and meet the requirements of selling to large markets (USDA Rural Development Mississippi hosted a Small Farmer Intensive (SFI), 2012; Walmart local sourcing expert testifies before Senate Agriculture Committee, 2012). Wal-Mart and representatives from other supermarkets are often invited to these Workshops to give presentations about their local sourcing programs and the requirements for local producers. For the USDA, collaboration with Wal-Mart in this region also coincides with the StrikeForce initiative, which focuses on channeling government resources to persistent poverty areas in Georgia, Arkansas and Mississippi[6] (MS Area Newsletters Mississippi NRCS, n.d.). Outside of the Delta region, Wal-Mart's

[6] Between 2011–2013 StrikeForce was expanded to include Colorado, New Mexico, Nevada, Alabama, Alaska, Arizona, North Carolina, North Dakota, South Carolina, South Dakota, Texas, Utah and Virginia (Secretary Vilsack Launches USDA "StrikeForce" Initiative to Boost Rural Economic Growth and Opportunity , 2013).

collaboration with the USDA, State Departments of Agriculture and University Extension are less formal, but still play a key role in facilitating producer access to this market, as explored in the findings section of this chapter.

In Central America, Wal-Mart runs a program called *Tierra Fértil*, which is managed by its subsidiary distribution company, Hortifruti. This program has been operating since the 1970s, when it was owned and operated by a regional chain that originated in Costa Rica (Gonzalez-Vega, Chalmers, Quiros & Rodriguez-Meza, 2006). While the goal of *Tierra Fértil* is to integrate small to mid-sized producers into Wal-Mart's supply chains by providing them with resources and training, in recent years many of the technical assistance aspects of the program have been outsourced through Wal-Mart's partnerships with development projects (Berdegué et al., 2005; Reardon & Timmer, 2007). These partnerships include those with US-funded aid agencies such as the USAID (United States Agency for International Development) and the Millennium Challenge Corporation (MCC),[7] which in turn subcontract development activities to local and regional NGOs (Gonzalez-Vega et al., 2006; Michelson, Reardon & Perez, 2012; USAID, Walmart Join Forces to Help Small Farmers and Enhance Food Security in Central America, 2011; Watkins, Swidler, & Hannan, 2012). In order to implement these partnerships, the subcontracted NGOs bring together other development organizations and local Universities, combining support from the US government with funding from other foreign governments, local governments and international NGOs and organizations, such as Oxfam and the Inter-American Development Bank. As the CEO of Walmart Latinoamerica expressed: "This partnership with the USAID allows us to broaden and accelerate our commitment to help small rural farmers in Central America lead a better life while also bringing our customers more affordable and higher quality food," (USAID, Walmart Join Forces to Help Small Farmers and Enhance Food Security in Central America, 2011).

After briefly describing my methods, subsequent sections turn to an analysis of firsthand data about the functioning of the hybrid partnerships and projects that have been developed by Wal-Mart, government agencies and non-profit organizations as part of Wal-Mart's local sourcing program.

4.7 Methods

The findings for this chapter are based on a research project that included content analysis of Wal-Mart's publicly available documents, as well as qualitative fieldwork in both the US and Honduras. Content analysis was performed on Wal-Mart's relevant documents from 2005 to 2012 in order to assess how the company

[7] The Millennium Challenge Corporation was a US foreign aid initiative developed during the G.W. Bush administration, in part with the goal to improve livelihoods in developing countries in order to suppress terrorism. It was controversial in its implementation, since countries needed to meet a certain number of pre-established criteria that essentially excluded many of the poorest countries from participating (Soederberg, 2004).

portrayed sustainability and localization. In this stage of the research, I systematically catalogued and analyzed references to "sustainability," and "local" in Wal-Mart's sustainability "fact sheets," internal reports, video presentations from conferences, promotional videos and press releases.

Fieldwork was conducted in order to explore issues surrounding the implementation of Wal-Mart's local produce sourcing program as a form of hybrid governance. Qualitative research methods were used to identify networks of organizations whose work involved facilitating relationships and exchanges across Wal-Mart's local supply chains by providing training and resources. In the US this included 21 semi-structured interviews with representatives from State Departments of Agriculture, University Extension, non-profit organizations and private distribution companies. In addition, participant observations were conducted at two Small Farmer Intensive Training Workshops. In Honduras interviews were conducted with 21 representatives from facilitating organizations, including development agencies, universities, and the USAID and former MCC projects. In addition, one Wal-Mart employee was interviewed in the US and in Honduras for a total of two company representatives. I also interviewed 27[8] producers in the US and 33 in Honduras who currently or previously had sold to Wal-Mart. While in the US only ten of these producers received assistance from a non-profit or publicly funded outside organization, in Honduras nearly all of the producers had received assistance. This reflects the fact that in the United States, Wal-mart's relationships with government agencies, NGOs and Universities are in the early stages, which limits the number of producer groups that the company buys from through these public/private partnerships (Walmart Locally Grown, 2012; Walmart local sourcing expert testifies before Senate Agriculture Committee, 2012). The role of state-funded and civil society organizations in facilitating Wal-Mart's local produce sourcing program warrants attention in order to understand how hybrid governance functions in this example of corporate sustainability, and what implications this has for policies and programs designed to facilitate the transition towards sustainability in the agri-food system.

4.8 Findings: State and Civil Society Facilitation of Wal-Mart's Local Sourcing Program

Since public/private partnerships in Honduras pre-date those in the US, which were mostly in pilot stages at the time of this research, in the following sections I draw primarily on observations in the US from Small Farmer Intensive Training

[8] Of the 27 producers interviewed in the US, seven did not sell to Wal-Mart at the time of this study. Of these seven, two had discontinued relationships with Wal-Mart; three had been contacted by Wal-Mart, or had contacted it, but had decided not to sell to the company; and two sold to other supermarkets through a food hub. Growers who had failed relationships with Wal-Mart and food hubs that did not to sell to the company were included in this study because it was determined that their perspectives were useful in evaluating the factors that led to the success, or lack thereof, in establishing and maintaining these commercial relationships.

Workshops, content analyses, as well as interviews with federal, state and public university representatives who operate outside the context of formal public/private partnerships with Wal-Mart, but who still orient their activities towards the integration of smaller-scale producers into supermarkets' local supply chains. In comparison, Wal-Mart's relationships with development organizations in Honduras date back to 2005; this was the year that the company bought a majority share in a Central American retail holding company, and the same year that both the USAID and the MCC began development projects focused specifically on providing agricultural training and connecting producers to supermarkets (Completes First Compact & Celebrates Successful Partnership with Honduras, 2010; Gonzalez-Vega et al., 2006; Painter, 2009; Rodríguez, 2006). As a result, analyses related to Honduras draw more heavily on semi-structured interviews with individuals who were involved with these projects and worked for local development agencies, as well as with producers who sold to Wal-Mart. Despite the differences in the longevity of these projects, there were similarities in the functions that they provided in order to facilitate Wal-Mart's local produce sourcing program, including infrastructure, organization of producer associations, relationship mediation and food safety training.

4.9 Public/Private Partnerships in the US

In Wal-Mart's public documents, and during the Small Farmer Intensive Training Workshops, Wal-Mart highlighted its projects in the Delta States Region as an example of the company's successful public/private partnerships (Walmart Locally Grown, 2012; 2012 Walmart GRR—Sustainable Agriculture, 2012). While most of these projects were in early or pilot stages, observations from these workshops suggest that the USDA and 1890 Historically Black Land Grant Universities played a key role in facilitating producers' access to infrastructure. For example, the most highly publicized group of producers that sold to Wal-Mart in 2011 was able to do so because of the construction of a processing and packaging facility that was funded by the USDA's Farm Service Agency. This facility was installed on a private farm, which in turn served as a central point for neighboring producers to pack, grade, store and ship their products; in addition, this farm had benefitted from a NRCS grant to install irrigation. One of the objectives of the Small Farmer Intensive Training Workshops was to inform producers about what types of federal resources, such as these types of grants, they could apply for through the USDA in order to help them meet the volume and quality requirements of big buyers like Wal-Mart. In the Southern and Delta regions of the country, this promotion of federal funding in the context of these Workshops was also an attempt by the USDA to re-build trust among minority and low-resource farmers, many of whom retained memories of USDA discrimination. For example, presentations about the services available through different USDA agencies were often followed by updates to the Pigford lawsuits, which were settled in favor of African American farmers who had previously been systematically denied access to resources through the USDA (Daniel, 2007).

In addition to providing access to funding for physical infrastructure, helping producers organize was another major theme in the Small Farmer Intensive Workshops. In some ways encouraging producer organization was related to infrastructure, since recent research in local food systems has emphasized the need for aggregation and distribution facilities in order to increase the volume of product that small-scale producers can offer, improving their economies of scale and their bargaining power vis-à-vis large buyers (Barham et al., 2012). While representatives from the USDA's Rural Development agency gave presentations about forming cooperatives, many producers resisted this model because of either negative previous experiences or fear of losing individual control over their products. Instead, food hubs are a newer model of aggregation and distribution that have received ample policy and program support in the US over the past few years, although none of the food hubs that were interviewed as part of this research sold directly to Wal-Mart (Barham, 2010; Barham et al., 2012; Morley, Morgan, & Morgan, 2008).

Instead of forming cooperatives or food hubs, some producers operated within a more loosely structured producers' association. However, this less formal structure at times inhibited the formation of a commercial relationship with a company as large as Wal-Mart, leading to the need for mediation by an outside organization. For example, in the early stages of developing the relationship between one producers' association and Wal-Mart, the University that was working with this farmers' group took on the role of receiving and transferring payments from Wal-Mart. An employee from the University emphasized that this was a temporary measure that would last only until the association could legally register as a cooperative, which would allow it to issue invoices without third party involvement. The question of how involved government and University employees should be in mediating relationships with Wal-Mart is one that emerged throughout this research. For example, a USDA representative explained that a major role of the organization was to provide introductions that would help to facilitate producer access to the new markets offered by Wal-Mart and other supermarket retailers. This was a sentiment that was echoed by many State Department of Agriculture and non-profit organization employees who were interviewed for this research. While these organizations saw their responsibilities as facilitating relationships between producers and supermarkets, many of these employees also saw limits to their role in this capacity. For example, one State Department of Agriculture participant explained his relationship with supermarkets as follows:

> I work with them on a primarily merchandising basis, rather than engineering who they're going to buy from or what price. I don't get into pricing issues or distribution issues, but I will answer questions concerning the capability of a particular grower and certainly try to spend most of my time promoting the item as a [State] locally grown item, with that certified [State] banner to the consumer.

In many instances, the State Department of Agriculture actually managed the design and placement of local signage within the produce department of several different supermarkets, and assumed responsibility for ensuring that the local brand was used on in-state products at the store level. These activities reflected a focus on connecting producers to markets and promoting local agriculture, but with an aversion to becoming involved in the actual economic transactions and relationships between producers and supermarkets.

Finally, the USDA, State Departments of Agriculture and University Extension employees all emphasized the importance of providing food safety training to producers as one of the key components of facilitating producer access to supermarkets. The USDA has its own food safety standard, referred to as USDA GAP (Good Agricultural Practices), while many State Departments of Agriculture rely on funding from the USDA's Specialty Crops block grant program to provide cost-sharing programs to subsidize food safety certification for producers in their state. University Extension, in turn, has been very focused in recent years on providing training sessions to help producers understand and implement food safety standards. However, while these training services are oriented around the USDA GAP standards, at the time of this research, Wal-Mart would not accept the USDA audit, and required certification from a private, third party organization instead. One extension agent explained that because of this, their training sessions were often insufficient to prepare producers to meet Wal-Mart's requirements.

Since the time of this research, the USDA has worked to create a new, harmonized food safety standard, and, in one more example of state-based facilitation of Wal-Mart's programs, the USDA announced that it had collaborated with Wal-Mart in order to incorporate some of the company's requirements into the USDA's certification process. The USDA's Agricultural Marketing Service (AMS) Fresh Products Division announced this development on their blog, saying,

> [th]e division will now provide auditing services to verify farmers are meeting the requirements of the Produce GAP Harmonized Food Safety Standards along with Wal-Mart-specific food safety requirements. The integration of our auditing services into retail purchasing processes helps local farmers meet the quality assurances needed to sell their fruits and vegetables to nation-wide chains, such as Wal-Mart. (Summers, 2012)

In these ways, state and federally funded organizations provided vital resources that helped to subsidize Wal-Mart's ability to purchase from local producers in the US.

4.10 Public/Private Partnerships in Honduras

In Honduras, Wal-Mart's public/private partnerships with the USAID and MCC also provided infrastructure, organization of producers' associations, relationship mediation and food safety training. Development agencies and non-profit organizations that were subcontracted through these projects provided producers with similar infrastructure as was provided in the US situation, including irrigation equipment and processing facilities. The distribution and use of this infrastructure was most commonly channeled through producer associations that included aggregation and distribution centers with processing facilities, which were also funded through international, state-based aid agencies.

As development agencies took on the responsibility of organizing producers and managing these facilities, they often also mediated the relationship between producers and Wal-Mart. In many ways this role included a commercial aspect, since development agencies were placed in the position where they needed to ensure

that the produce that was delivered to Wal-Mart met quality standards and wouldn't be rejected, which would incur financial losses for the producers' association. As a result, these publicly funded organizations monitored and enforced Wal-Mart's quality standards, often visiting producers' fields to advise them about production practices and to see which produce would meet Wal-Mart's quality standards and which would not. Development agencies that took on commercial responsibilities while mediating the relationships between Wal-Mart and producers often faced conflicting pressure between satisfying Wal-Mart's requirements and development goals of providing aid to producers. Development agency representatives reported having to cut producers from their programs in situations where producers struggled to meet Wal-Mart's quality standards, since the production of low quality produce put the agency's relationship with Wal-Mart in jeopardy. As a result, this type of public/private partnership has the potential to lead to the exclusion of producers with lower production capacities, thereby perpetuating the income inequalities that they were designed to address.

Similarly to the US, a large portion of these agencies' responsibilities also revolved around issues of food safety. In this context, the Honduran government did not have food safety standards in place for the domestic market. Instead, as the government representative explained, their efforts were focused on certifying and supporting export growers, who, as a result of an outbreak of salmonella on melons in 2008, received yearly inspections from the US Food and Drug Administration (FDA). The Honduran Department of Agriculture was working in conjunction with the local university to develop and implement a food safety standard for domestic producers, and one of the development agencies that had a partnership with Wal-Mart was also working to update the government's pesticide registry. While the government representative expressed interest in working more closely with Wal-Mart on issues of food safety certification, he also suggested that the government's ability to address these issues was affected by the 2009 coup d'état and a corresponding lack of funding.

The small role that the Honduran government played in creating and implementing food safety standards, and the subsequent responsibilities that universities and development agencies assumed instead, are illustrative of theories that describe neoliberal patterns of governance. In this context, we can see how Wal-Mart's sustainability program, and its partnerships with development agencies, essentially superseded and replaced national governmental regulations and programs. However, development agencies that were funded by either the US or other foreign governments (including European countries and China) played a key role in facilitating Wal-Mart's ability to source local produce, including developing and implementing food safety standards. Specifically, Wal-Mart and one local Honduran development agency worked together to adapt the Global GAP standard to make it more applicable to the conditions of small-scale producers in a developing country.[9]

[9] After this research was conducted, GlobalGAP came out with a new standard called localg.a.p. designed to increase the ability of small-scale producers in developing countries to become certified ("localg.a.p.," n.d.).

In addition, this agency took on the responsibility of training and certifying producers using these adapted food safety standards. Since the agency believed that food safety certification fulfilled its goal of promoting sustainable agriculture, it paid for the costs of training and certification with the funds that it received from international donors.

Despite the fact that these standards were adapted to make them easier to comply with, and that the costs of certification were covered by the development agency, only a small number of producers were able to achieve certification. Nonetheless, development agencies continued to integrate elements of food safety into their outreach activities so that producers would be able to sell to Wal-Mart even without being formally certified. Combined with the monitoring and evaluation of Wal-Mart's quality standards in the context of development agencies' management of producers' associations, the permeation of food safety standards into the development agenda illustrates how corporate governance of the agri-food system manages to control production processes while outsourcing costs to NGOs. These are important findings since formal, private standards are most often described as the means by which corporations control production practices while outsourcing costs; however, in this case Wal-Mart's partnerships with publicly funded development agencies performed this function, even when formal certification was not involved.

These findings also have implications for sustainable development. Participants in this study, including both representatives from development organizations and producers, identified sustainable production practices as those that promoted food safety. This suggests that the promotion of food safety practices in order to facilitate the integration of small-scale producers into supermarket supply chains influences how sustainability is defined in the development context. While food safety and sustainability may be compatible in certain situations, for example with the reduction of chemical usage, previous research has indicated the possibility that concern for food safety may discourage producers from implementing practices meant to encourage and promote environmental conservation (Stuart, 2009). These examples illustrate how corporate influence over the definition and implementation of sustainability may not always be in keeping with the goals of expanding sustainable development opportunities to small-scale producers.

4.11 Discussion and Concluding Thoughts

The findings presented here indicate that Wal-Mart's sustainability initiative, and particularly its local produce sourcing program, are facilitated through involvement by state and publicly-funded organizations. In this illustration of hybrid governance, we can see Wal-Mart's strategy of outsourcing responsibilities, costs and risk in its supply chain, and how outside organizations adapt to meet the retailer's needs because of the promise of an increased market for small-scale producers. In both the US and Honduras, federal and state agencies provided funding for infrastructural support, such as irrigation and processing facilities, while also providing training

and resources for food safety and quality. Non-profit and state-funded organizations in Honduras were much more involved in mediating commercial relationships than their counterparts in the US, who engaged with producers and markets, but remained wary of interfering in economic transactions. Since University Extension in the US receives state funding, and development organizations in Honduras are funded through international governments and US federal agencies, the services that these organizations perform are essentially a public subsidy to Wal-Mart's sustainability initiative. These findings are supported by other research, which demonstrates how Wal-Mart's business strategies are often subsidized by outside organizations. For example, research has shown that Wal-Mart's low price strategy is contingent on the low wages it pays its associates, as the company calls its employees; these low wages, in turn, are essentially subsidized by federally funded public assistance programs, such as Medicaid[10] (Goetz & Swaminathan, 2006).

Some may consider the public subsidization of sustainability initiatives in the agri-food sector through forms of hybrid governance an appropriate use of government funding. If the US government subsidizes less sustainable industries, such as the oil industry, then perhaps providing infrastructure, training and resources to help smaller-scale producers participate in supermarket supply chains is a preferable use of public money (Victor, 2009). In the current neoliberal economic context, we may choose to accept the concept of hybrid governance through public/private partnerships, and agree that some of the costs of transitioning to a more sustainable food system should be borne by the public. However, in the cases presented above, the issue is not public subsidization in and of itself; rather, the problem is that the sheer power and scale of a company such as Wal-Mart gives it undue influence over how sustainability is defined and implemented. This was seen in the case of the introduction of food safety to the sustainable development agenda, as well as in the example of the USDA's adjustment of its food safety regulations, which showed how the government bent to the corporation's authority, and not vice versa. In these examples, the concentration and oligopolistic conditions within the supermarket industry makes federal support of agricultural projects appear as subsidies to an individual company, rather than as creating a sector-wide benefit.

This returns us to the essence of the theories that explore governance and responsibility in a neoliberal, globalized economy, including the appropriate roles of market, civil society and public organizations. Many theorists suggest the continued need for a strong state in mediating corporate interactions with the environment in order to ensure democratic participation, legitimacy and real environmental reform

[10] For example, a recent report from the Democratic staff of the Committee on Education and the Workforce used data from Wisconsin's Medicaid program to estimate Wal-Mart's costs to taxpayers in that state; they found that "one 300-person Wal-Mart Supercenter store in Wisconsin may result in a cost to taxpayers of *$904,542 per year*—about $3,015 per employee," (*The Low-Wage Drag on Our Economy: Wal-Mart's low wages and their effect on taxpayers and economic growth*, 2013; emphasis in original).

(Buttel, 2000; Eckersley, 2004; Horlings & Marsden, 2011). These theorists argue that it is the state's responsibility to determine the conditions of the market so that creating environmental benefits is economically efficient for businesses (Glenna & Mitev, 2009). In the case of promoting a transition to sustainability in the agri-food system, this may mean that the state needs to play a larger role in limiting the oligopoly that has formed in the supermarket retailing industry, which previous state policies facilitated. As this research demonstrated, state facilitation of Wal-Mart's sustainability initiative looked less like true partnership and more like service provision. In addition, the government must take the lead in defining the term "sustainability" in order to ensure that the inevitable trade-offs and compromises that come with attempting to simultaneously increase social, environmental and economic benefits are made with the well-being of the public in mind. While the growth of CSR initiatives reflects the expectation that corporations have a responsibility to contribute to the common good, the process by which stakeholders make demands on companies is critically different than citizens' claims to representation by public entities. Because of this, it is important for policy makers to closely examine the role of the state in supporting and facilitating corporate sustainability programs and to recognize that, far from examples of self-regulation, these programs depend on public funding and activities. If governments are to engage in public/private partnerships, their position needs to be strengthened in order to ensure that they do so on a level playing field so that the promises of CSR and sustainability are realized in a way that promotes the common good.

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Chapter 5
IPRs and the Transfer of Technologies that Combat Climate Change: The Untapped Potential of Licensing

Menno van der Veen and Patricia Osseweijer

Abstract The threat of climate change—problems requires new technologies to mitigate the effects and adapt to new circumstances. Many of these new technologies, such as next generation biofuels, GMOs or new solar technologies, are patented. Companies and institutions in wealthy countries own most of the patents. In recent decades, developed countries have made promises to transfer technology to developing countries. But despite these promises, more action is needed. To that end, two new institutions, the Technology Mechanism and the Green Climate Fund, were established after the Copenhagen climate summit in 2009. Intellectual property rights are absent from their policies despite calls from developing countries to address the issue. In this chapter we argue that there is untapped potential in the business community to license technologies on favorable terms to developing countries and we suggest that the new climate change institutions could aim to become a global facility for licenses to climate change technology to promote technology transfer.

5.1 Introduction

The threat of climate change is a primary concern in the quest for a sustainable future. Many existing energy sources, production methods, distribution systems, agricultural practices, and even building materials create undue environmental stress or lack economic viability in a climate-changed world. New or adapted technologies could provide significant relief to mitigate the risks. Their adoption is not straightforward and will be of major importance in the coming years and should be an essential component of sustainability thinking.

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This threat is likely to strike developing countries particularly hard. Developing countries that depend on agriculture to contribute at least 50 % of their GDP will lose in some cases even 30 % of their agricultural productivity in the next 70 years due to climate change. In contrast, the developed world risk is less as the share of GDP related to agriculture is mostly less than 10 %. Some may even profit from climate change (Cline, 2007; Waithaka, Nelson, Thomas, & Kyotalimye, 2013; Nelson, 2003). The need for developing country access to ameliorating technology is therefore arguably greater than the developed world.

Given the growing concern, enhancing the transfer and diffusion of climate friendly technologies, particularly to developing countries, has been a key priority in discussions under the United Nations Framework Convention on Climate Change (United Nations Framework Convention on Climate Change [UNFCCC], 1992). These negotiations have resulted in the creation of two new international bodies, the Technology Mechanism, and the Green Climate Fund, whose combined action could make a significant contribution to boosting the transfer and diffusion of green technologies. This would be particularly valuable to the poorest and most vulnerable countries which often cannot afford to pay market prices for these technologies and lack physical and human infrastructure that could facilitate their dissemination, yet are faced with (fast) growing population and related energy, food and infrastructural needs.

At the same time empirical evidence shows a significant rise of proprietary technologies in the green technology sector. Many of the most promising innovations, such as advanced biofuels, solar cells, and water purification, are tightly secured with property rights—particularly patents—and controlled by firms and institutions based in developed countries. This has generated concern among many developing countries that intellectual property rights (IPRs) may serve as a barrier to the transfer of climate-change technologies (CCTs). One can define CCTs as technologies that can either mitigate the effects of climate change or help to adapt to the circumstances caused by climate change. As Sarnoff (2011, p. 311) puts it: "The range of technologies having climate effects, or accomplishing mitigation or adaption needs, is staggering. For example . . . one U.S. study identified hundreds of technologies in various categories, such as 'end-use/infrastructure (e.g., transportation), energy supply (e.g., hydrogen), carbon capture-storage (e.g. geologic storage), non-CO_2 GHGs (e.g., methane from landfills), [and] measuring & monitoring capabilities (e.g., oceanic CO_2 sequestration).'" The use of patents may differ dramatically in the context of different kinds of technologies, industry sectors, users and innovators (Cahoy, 2012).

Developing countries have raised the issue of intellectual property rights (IPR) in the context of the climate change negotiations and presented proposals that entail the relaxation of international rules in this area to facilitate access to CCT. Industrialized countries on their part, have opposed such proposals arguing that IPRs are an essential incentive for the development of such CCTs and a key facilitator for their transfer and diffusion. These diverging positions have resulted in a stalemate, though the issue continues to regularly resurface in discussions at the UNFCCC, including in the context of the newly established Technology Mechanism.

Significantly, businesses are caught in the middle of this debate. Those on the cutting edge of climate change research and development have an interest in ensuring a

return on investment through the assertion of intellectual property rights. Those that interact with developing countries and vulnerable populations care deeply about technology access that can still support a viable business model. And no matter what their strategy, all businesses desire clear and predictable rules. The divergent positions on climate change IPR are a damper on business investment and, if not addressed, may reduce their contributions to this aspect of sustainability.

One of the reasons behind the stalemate in the discussion on IPRs in the field of climate change is the almost exclusive focus on normative considerations relating to the extent that international intellectual property standards might facilitate or hinder the transfer of climate technologies. Such a focus has been at the expense of more pragmatic approaches, including schemes to encourage the *voluntary* licensing of CCTs, which may better promote the transfer of technologies to developing countries. The new international fund, the Green Climate Fund, will manage a large part of the money pledged by developed countries to developing countries, and it could play an important role in this regard.

In the first section of this chapter, we will describe the relationship between IPRs and technology transfer of CCTs, followed by an identification of the key issues. In the second part we describe how licensing of IPRs to international organizations could provide a new opportunity to promote transfer of CCTs. We use the Green Climate Fund as an example to discuss the possibility of a global license facility to promote technology transfer to developing countries and the various issues that come with licensing of CCTs. Notably, this chapter draws on workshops on CCTs and IPRs involving various stakeholders (rights owners, NGOs and academics) that were organized in part by Dr. van der Veen in 2011 and 2013 in Cape Town, Amsterdam and Geneva.

5.2 The UNFCCC, IPRs and Technology Transfer

The United Nations Framework Convention on Climate Change was adopted at the Earth Summit in 1992 in Rio de Janeiro. Its goal is to help limit global temperature increases and cope with the inevitable impacts of climate change. The first of the annual conferences took place in Bonn in 1995 (COP-1). The convention acknowledges that industrialized countries have a greater obligation to address climate change than developing countries, captured in the principle of common but differentiated responsibilities. One of these responsibilities of developed countries is to make funding available for developing countries and ensure technology transfer.

Among the important steps in the following years was the adoption of the Kyoto Protocol by thirty-seven countries (COP-3). The Protocol included an obligation for greenhouse gas reduction by an average of 5 % below the levels of the benchmark year (1990) by 2012 (Kyoto Protocol, 1997). The United States did not ratify that protocol, however, which served as an impediment to global remediation governance. Subsequently, even some ratifying countries failed to make their stated goals of greenhouse gas reduction.

In 2009, the UNFCCC summit in Copenhagen (COP-15) intended to take the existing agreements one step further. The forthcoming expiration of the Kyoto Protocol in 2012 and the election of U.S. President Obama created a sense of both urgency and optimism, and many hoped that political momentum might result in a groundbreaking new accord. However, despite the presence of many world leaders, a final, binding agreement was not reached. The members did arrive at a draft-agreement that has since then served as a basis for further negotiations (Report of COP-15, 2009). The agreement sets a goal of limiting the global temperature increase to no more than 2 % above pre-industrial levels by restricting greenhouse gas emissions. Unfortunately, there is no mechanism to enforce this agreement.

In 2010 at the summit in Cancun (COP-16), developed countries pledged to provide more funding for developing countries and to accelerate action on technology transfer. To this end the Green Climate Fund (GCF) and the Technology Mechanism (TM) were established (Report of COP-16, 2011). It is these two tools that provide the essential structure for the licensing exchange described in this chapter.

5.3 Technology Transfer and the Role of Intellectual Property Rights Regimes

The 1992 UNFCCC already recognized the vital importance of the transfer and development of technologies to developing countries for the implementation of the convention. This clear in the general formulation in Article 4.1(c), which states that all parties shall:

> promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors . . . .

The UN Intergovernmental Panel on Climate Change (IPCC, 2000) defines technology transfer as:

> … a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs, and research/education institutions.

This definition has become widely used, for example by the UNFCCC's Global Environmental Facility (GEF) that implements the policies of several trust funds, including the special climate change fund and the adaptation trust fund.

The Treaty on Trade Related Aspects of Intellectual Property Rights (TRIPS) also contains an article on the transfer of technology to least-developed countries (LDCs). Article 66.2 of the TRIPS Agreement (Trade-Related Aspects of Intellectual Property Rights Agreement [TRIPS], 1994) states that:

> Developed Country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least developed country members in order to enable them to create a sound and viable technical base.

In 2008 the United Nations Conference on Trade And Development (UNCTAD) and the International Centre for Trade and Sustainable Development (ICTSD) issued a policy brief on IPRs and Sustainable Development (Moon, 2008). The question of the brief was: "Does art. 66.2 encourage technology transfer to LDCs?" One of the findings was that information was scarce, and that there is no commonly agreed upon definition of technology transfer. They did however find that, out of 292 projects studied, only 22 % involved technology transfer projects specifically targeted to LDC members. This suggests that despite, the importance of technology transfer to LDCs, the industrialized world is lagging in its aspirations to satisfy the obvious need.

In their publication on transfer of technology to the least developed countries (focusing on Bangladesh), Islam and Zaman (2010) state that foisting a mandatory IPR regime on all WTO members erects "insurmountable" barriers to LDC access to green technologies. Wong (2011), in assessing whether the existence of IPRs can be considered as a boost for technology transfer and development, suggests that the results of existing studies are less than clear. It seems clear, however, that LDCs have not benefited from TRIPS regime in terms of technology transfer (Moon, 2008). This is one reason why developing countries argue that IPR regimes should be part of the negotiations on transfer of CCTs.

To address this shortfall, the (UNFCCC) Contact Group on Enhanced Action and Development has come up with various suggestions to change the IPR-regime in a manner that promotes the transfer of technology to developing countries, varying from a system in which parties share their technologies, to the compulsory licensing of IPRs in situations in which they can be proven to serve as a technology transfer barrier (AWG-LCA, 2009).

But these calls for addressing IPR regimes in the context of climate change have had little effect. They have been absent the official UNFCCC decisions on technology transfer (Gollin, Hinze, & Wong, 2011). Moreover, developed countries continue to push strong protection of IPRs as a necessary means to stimulate research and return on investment, deeming the topic as essentially non-negotiable. The debate has resulted in a deadlock that has remained unchanged in recent years.

5.4 The Importance of Patents in the Transfer of CCTs

In his detailed article discussing various aspects of the patent system in relation to the climate change decisions of the UNFCCC, Sarnoff (2011, p. 303) points to the importance of IPRs:

> The amount of greenhouse gas emissions and the extent of climate change, as well as the problems that climate change will cause and how well society responds, will depend substantially upon the rapid development and widespread dissemination of a wide variety of new climate change technologies. The availability of substantial public funds and the huge potential private markets will attract new technological development and will encourage patenting (to differing degrees in various industries) in the hopes of appropriating returns. In turn, the costs of climate change mitigation and adaptation measures will depend on whether these climate change technologies are patented, on how they are licensed, and on what technological substitutes are affordably available.

Most patents to CCTs are found in developed countries (Lee, Ilian, & Preston, 2009) among which the "big three"—the United States, Japan and Germany—own most of the technologies, followed by France and the UK and China and India "running up" (Barton, 2008). The green bubble and the race to find commercially viable CCTs has resulted in an enormous increase in patents. The number of patents in the energy sector outnumbers those in other sectors, and within that sector biofuel patents outnumber competing energy technologies such as wind and photovoltaic energy (Gollin et al., 2011).

Some argue that the importance of IPRs for the transfer of CCTs is overestimated. One of the strong arguments against their importance is that the climate-change-related inventions patented in developed nations are not always patented in developing countries (Barton, 2008; Cannady, 2010). It is noteworthy that Sarnoff does not specifically refer to developing countries in his discussion of patent barriers. Unpatented inventions would obviously be free to use in those developing nations and there would be no barrier to the implementation of underlying technologies. In addition, older technologies once patented may now be available. Burleson (2012) points out that developing countries are in need of technologies like rainwater harvesting, drip irrigation, black carbon mitigation through solar and advanced cook stoves that are often off-patent. But she also makes the point that LDCs should not become the dumping ground for obsolete energy infrastructure.

Still, the availability of some unpatented technology does not mean that IPRs are not a barrier. For example, in the field of climate change, according to the European Patent Office and the United Nations Environment Programme (EPO/UNEP, 2013, p. 52), adaptation technologies that are invented in developed countries are often patented in Africa:

Indeed, when we control for the overall volume of patents in a given field and their propensity to be patented widely, we conclude that many adaptation technologies tend to be protected relatively more often in Africa than elsewhere in the world. This is true especially for grid resilience and desalination, and to a lesser extent for solar water treatment and severe weather prediction. Conversely, solar cooking and efficient lighting for remote locations are relatively less frequently protected in Africa than elsewhere. Again, this is rather surprising.

During the period 1980–2009, the number of adaptation–related patents registered with African patent offices increased every year by as much as 17 % on average, while patenting in general actually decreased.

In addition, technologies are not patented in developed countries may pose a problem if patented in developed nations. If a developing country wants to make use of a certain technology (e.g., a technology for water purification), but lacks the knowledge to do so, it may be compelled to rely on an institution—e.g., a NGO or University—from a country in which that technology is patented. In this case, the "helping-institution" would need to make and export a protected technology, activities that generally require a license. The failure to obtain a license would be simple infringement. One could refer to this limitation as the "global shadow" of IPRs obtained in developed countries.

Another factor to consider is that patent owners may delay filing in developing countries until they see a market emerging for their inventions. In other words, an area of technology may appear to be in the public domain only due to the absence

of a market for those products and (in most cases) a lack of capacity to produce them in that country. It follows from this non-market argument that technologies will be patented in countries where a market is emerging, as is indeed the case in the agricultural sector (seeds) and for water purification technology. The fact that a technology is not patented in a country is better viewed as a sign of the incapacity of the developing country rather than a longstanding right to freely copy climate change innovation. This counter to the positive effects of legal copying, wherein a country permits replication of (foreign) technologies and boosts the know how, capacities and force of its domestic industries. As soon as a country reaches a capacity-level that allows it to copy complex technologies, the inventors will start to file patents in that country. For this reason, technology transfer of CCTs also requires an understanding of the accompanying or enabling technologies.

In contrast to the small or absent markets for CCTs that may exist in developing countries, such technologies have arguably supported a new "bubble" in developed countries. This has resulted in heavy investment in various eco-friendly start-up companies, "green investment funds" and new "clean technologies." This fact is often used to support the notion that the green revolution is public-driven in contrast to the biotech revolution, which had a more private character. Green technologies have a broader scope as well.

Many companies are creating large patent portfolios in green technology, hoping that some of the patents will provide the proverbial golden ticket. The heavy investment in patents for CCTs is likely to result in a model where only countries that provide a market for green technologies will profit from new developments. This may leave out some of the countries most in need of new technologies such as small island states and poor countries like Bangladesh that are extremely vulnerable. The large investments in green technology-IPR may prevent owners from engaging in technology transfer schemes that are not fully secure with respect to the home country.

The supporting role of IPRs in the commercial race for clean technologies as well their use as an access barrier has been emphasized in existing reports, panels and scholarly studies, some of which are written from a developing country perspective (Calestous, 1999; Mara, 2009, 2010; Srinivas, 2009). Conversely—and in line with the divide—various patent offices have piloted fast tracking procedures for green technologies as an incentive for green inventions. A conflict seems inevitable and a bridge across this gap is critical. If a system could be devised that would promote licensing of technology on favorable terms to developing countries, it could serve as this bridge and potentially yield one of the most important solutions to the problem of CCT transfer (Calestous, 1999).

5.5 IPR-Policy and the Green Climate Fund

5.5.1 Green Climate Fund Structure

At the UNFCCC summit in Copenhagen, developed countries pledged $100 billion per year, starting in 2020, for developing countries to help ameliorate the effects of climate change (Report of COP-15, 2009). The Green Climate Fund (GCF) is the

key enabler of this pledge, as it will disperse a significant (but unspecified) share of this money for mitigation and adaptation projects. The GCF is part of the financial mechanism that the UNFCCC has established to assist developing countries in implementing the convention.[1]

The GCF should be fully operational around 2015 and may eventually—assuming that countries fulfill their pledges—disperse about $ 20–25 billion per year.[2] In Durban, at COP-17, the governance structure and guiding principles for the fund were agreed upon (Report of COP-17, 2012). The fund is to be managed by an independent secretariat and has a board of twenty-four members with a 50–50 split between developed and developing countries. It will also have a private facility, to fund private sector projects. In 2014 it opened its secretariat in Songdo (South Korea).

The Durban text refers to "direct and indirect" public and private sector financing by the Green Climate fund, and points out that the GCF may receive financial inputs from alternative sources (Report of COP-17, 2012). This chapter's proposal to credit the donation licenses to CCTs as a type of funding from an alternative source rests on this basis.

5.5.2 Technology Mechanism Structure

To enhance action on technology transfer, a Technology Mechanism (TM) was established in 2010 at the UNFCCC summit in Cancun, Mexico (COP-16). The TM comprises a Technology Executive Committee (TEC) and a Climate Technology Centre and Network (CTCN). The TEC consists of 20 members that serve in their personal capacity and are tasked with articulating the modalities of the mechanism in manners that include the periodic publishing of technology outlooks and other activities of analyzing and synthesizing of scientific outcomes. In addition, they are to engage in various kinds of network activities such as promoting the sharing of information and knowledge (UNFCCC, 2012, January 7). The function of the CTCN is, among other things, to identify existing climate friendly technologies for mitigation and adaptation and to facilitate the adaptation and deployment of currently available technologies to meet local needs and circumstances (UNFCCC, 2014).

[1] In addition to the Green Climate Fund, the Special Climate Change Fund and the Least Developed Country Fund are established under the convention managed by the Global Environmental Facility (GEF), the Adaptation Fund is established under the Kyoto Protocol, the GEF assists in its management.

[2] Personal conversation with André Loozekoot of the department of foreign affairs of the Netherlands, on 19 May 2011.

5.5.3 *Connecting Funding and Transfer*

Linking technology transfer to the GCF is established by the requirement that UNFCCC signatories ensure adequate resources for technology development and transfer.[3] At the summit in Durban, an adaptation committee was established to coordinate GCF-financing for adaptation measures to developing countries. Still, this is a loose connection, and several authors have argued that the technology transfer system and the green climate fund should be more explicitly related (Islam & Zaman, 2010; Tawney & Weischer, 2011). To make this connection, we outline a licensing model that could work with the Green Climate Fund (GCF) and link to the technology mechanism. In doing so, we provide a solution to the aforementioned international deadlock on IPR and CCT.

The proposed scheme aims to bring the technology where it is needed. Burleson (2012, p. 12), for example, envisions the TM as an inclusive innovation hub that contributes to "culturally sound" innovation which will adapt technologies to local circumstances. She also points to the importance of technology hubs that can serve as centers for diffusion and development of technologies.

We focused specifically on licensing and also started from the ideal of a "technology-hub." Compare an airport such as London's Heathrow that is one of the world's most active travel hubs—a place at which most passengers change planes rather than depart to their final destination. This is how we envision the IPR policy of the GCF. Ideally, it will create one or more hubs for climate change IPRs that move from the GCF to those destinations where they are needed.

Recently, some initiatives consistent with our model have already begun. WIPO Green (World Intellectual Property Organization [WIPO], 2014) was launched in to 2013 with the aim to become a global marketplace for CCTs. IPXI, which calls itself the world's first financial exchange for licensing and intellectual property rights goes even one step further: IPR-owners give an exclusive license to their technology to the organization that then trades non-exclusive licenses on their behalf through their own exchange (Quinn, 2012). To these initiatives, we would add the goal of considering the interests of developing countries to any plan that supports the interests of the business community.

As background for the proposal we considered a global survey of technology holders undertaken by the United Nations Energy Programme (UNEP), the European Patent Office (EPO) and the ICTSD to better understand licensing activities for clean energy technologies (2010). One of the key objectives of the survey was to obtain insights into whether technology holders were actively involved in licensing CETs to firms and institutions in developing countries (non-OECD countries). The majority (58 %) responded that in the past three years they had not entered into licensing agreements with entities based in developing countries. Licensing activity was limited to some developing countries, mainly China, India and Brazil. Protection of IP in the recipient country was of importance to respondents when considering

[3] Par. 38, Annex to Draft Decision (-/CP.17).

whether to enter into licensing agreements. It was cited an important factor by 82 % of organisations, with 54 % stating that it was either a significantly attractive condition or a compelling reason for an agreement.

However, the protection of IP alone was not the only important factor in deciding whether to license to developing country entities. In line with findings in literature as well as empirical studies, scientific capabilities, infrastructure and human capital, favorable market conditions and investment climate were considered slightly more important, with between 85–87 % of respondents so stating. Interestingly, it should be pointed out that 70 % of respondents said they were prepared to offer more flexible terms when licensing to developing countries with limited financial capacity.

In addition to the UNEP, et al., survey, we also considered direct feedback from stakeholders. This proposal is the outcome of a series of workshops with experts that were organized in Cape Town, Amsterdam and Geneva as part of a joint effort between WTO and the coordinators of a research project on valorisation of emerging technologies in The Netherlands. The multilateral feedback yielded detail and perspective that we have attempted to capture in our model.

5.6 Outline of an IP-Policy for the GCF

The proposed policy is built on the following starting points:

5.6.1 Licenses in Exchange for Funding

The GCF will have thematic funding windows for mitigation and adaptation projects. The fund will secure resources for capacity building, technology transfer and technology development (Report of COP-17, 2012). Those themes may result in new thematic windows. Thus, some of the projects of the fund will involve the development of new technologies. We argue that if this is the case, the fund should possess licenses to these technologies that allow it to give the technology to its beneficiaries. If this is done through the TM, it will also possess of the know-how to implement the projects. This would provide a promising starting point. Of course, there may be many additional issues. For example: what if the technology can also be used in developed countries? As a funding source, should the GCF receive some of the profits? How can research exemptions, non-exclusive licensing and march-in rights be addressed in GCF policies. Such issues must be resolved at some point down the line.

5.6.2 The GCF as a Purchaser of Licenses

One cannot expect IPR owners, responsible for running their companies and institutes, to give priority to the licensing of their technologies to the GCF. However, the fact that they do not proactively offer licenses of their technologies to the fund does

not imply that they are unwilling to do so. There is evidence that, if not for the transaction costs, companies are willing to provide licenses to their technologies to developing countries. The GCF could therefore, in coordination with the business community, come up with a small number of standard licenses that could be offered on its websites to reduce transaction costs. In addition, it could initiate contact with IPR-owners to attempt to persuade them to provide a license to the fund.

5.6.3 GCF as an Established Name

A major incentive to donate technology to the fund is the perceived PR value of such donations (Derclaye, 2010). Therefore, the GCF should be "branded" to become a well-known name that will make it attractive for license donations. Additionally, a public that is aware of the GCF may also put pressure on specific companies that refuse to license. Such forces do exist at this moment, and their pressure might eventually result in an IPR-system that places less emphasis on protection. Perhaps the more likely result of a well-branded GCF to which IPR-owners feel some moral obligation to donate is a future situation in which patents lose importance as more systems of patent pools and compulsory licensing emerge (European Patent Office [EPO], 2007). This results would be a soft IP system (mandatory access for payments) that applies to most technologies, including environmental technologies addressing climate change (Gollin et al., 2011). A well-branded GCF could, in an ideal situation, help to realize this situation for CCTs that can be used in developing countries if IPR-owners would profit from a donation. Interestingly, this would necessarily result in a cross-licensing (pool) system for the donators, as discussed below.

5.6.4 GCF Licensee Issues

The GCF will have to deal with some important issues associated with serving as licensee. First is liability issues. In a recent publication on legal issues in biotechnology, Murphy points out that liability-issues may also be a barrier to technology transfer as a result of the great variety of liability regimes that exist in various countries into which CCTs will be transferred. For example, various climate friendly technologies may include biotechnological inventions that carry risks associated with their use. Liability risks may dissuade IPR-owners from licensing their technologies. However, the problem could probably be solved to some extent in the various licenses since the GCF will have funding to pay for damages and insurance, and will be in a better position to negotiate with its beneficiaries on these issues (Murphy, 2001).

Another issue relates to the conditions under which the GCF could sub-license technology to its beneficiaries. Those conditions could be based on quality-assessments of the parties that ask for the right to make use of a certain technology. The sub-licenses should include indemnification clauses for licensor and sub-licensor as well as descriptions of the purposes for which the technology can be used.

Finally, the GCF must decide who should manage its license-portfolio.

Because of the many technologies involved and the expected large number of licenses, the management of the IPR-portfolio will be another complex issue for an already very complex fund. It would therefore make more sense if another institute would manage the IPR-portfolio (in the same manner that World Bank will act as the trustee for the fund). There are at least three ways to do this: (1) create a new IPR-institute for the UNFCCC; (2) assign the World Intellectual Property Organization (WIPO) to serve as the managing entity; or (3) employ regional or national patent offices to manage the IPR-portfolio for their respective regions.

Each option has its pros and cons. One major benefit of UNFCC oversight is that the establishment of a separate, new IPR institution could yield an important IP-center for a great variety of IP. This is particularly true if it could act in the service of the Convention of Biodiversity. However, such benefits would require a new international compromise that might take years to become functional.

The WIPO, being a world organization, could act as a managing entity. The WIPO is already an established institute. However, it does not have expertise in the management of IPRs.

Regional and national patent offices like the EPO do on the other hand have this experience and could probably attach the information on GCF-licenses to their databases. However, patent offices in various developing countries have less reliable systems that could make it harder for potential users to find the various licenses. The reliability problem could probably be solved if the climate technology centres and networks would also have access to the databases. , Given the fact that that the GCF-database would be supra-national, an entity like the EPO would be a natural host for the database.

5.7 Some Licensing Options

In the final section of this chapter we endeavor to address some of the (many) options that come with licensing. For example, Sarnoff (2011, p. 350) argues that when public institutions are involved in IPRs they should adopt models to retain rights for humanitarian licensing and summarizes the many options that come with these arrangements:

> Retained rights of owners could also preserve authority to engage in so-called "humanitarian licensing" to assure access and to control prices when necessary to override sublicensing, supply, and pricing decisions made by the owners' licensees. Humanitarian licensing terms could be as broad as reserving rights for "meeting the needs of developing countries," or could be more specific triggers (which better avoid subsequent disputes) such as defining income levels, specifying subsistence uses, specifying geographic markets, identifying and segmenting markets by specific commercial and humanitarian activities, and even preventing the filing of patent applications in particular jurisdictions. Increasing numbers of universities are adopting such humanitarian licensing policies to assure low-cost access, and private foundations have also modelled so-called product development partnerships on market segmentation and on retaining rights to assured continued non-profit research and development, to supply low-cost access where it otherwise might not occur, and to achieve other important social goals.

The fact that there are so many CCTs will make it very difficult to come up with only one or two model sub-licenses. A preferred model would be if the GCF could come up with a system that allows the licensor to pick its conditions for sub-licensing. This is a complex issue, likely requiring the development of pilots by universities, WIPO, EPO, etc.

To provide more insight in all these complex issues, we offer various (categories of) conditions that could provide options for these rights holders when they are willing to license their technology to an international institution. They were inspired by the work of agricultural biotechnology, PIPRA, known for developing IP-solutions that take into account the needs of developing countries. Essentially, this is a Creative Commons approach to patent licensing, and it has been discussed in interviews with various stakeholders and tested in the aforementioned workshop organized in Cape Town.

We introduce five categories. Any given license could be crafted by choosing one option for each category. We argue that these categories provide valuable options around which the GCF could develop its specific model licenses.

Categories:

A. Geographical. A1 All developing countries,—A2 Some countries excluded,—A3 only specifically mentioned countries.
B. Number of Uses. B1 Unlimited use,—B2 not more than an-amount of uses without specific permission—B3 only once.
C. Commercial/non-commercial. C1 For commercial and non-commercial use,—C2 for non-commercial uses and commercial uses up to a certain threshold,—C3 for non-commercial uses only.
D. Which projects. D1 For all projects in beneficiary countries as well as any other country. D2. For all projects in the countries of beneficiaries. D3 Only for GCF-funded projects.
E. Pool-option. E1. Yes, the license also applies to other licensors that have chosen the E1 option. E2 No.

5.7.1 Geographical

In this category a distinction is likely to be made between developing countries that are regarded as important or potential markets, and countries that are not. Technology would be licensed to users in a specific list of countries that is likely to include LDCs, and to exclude the BRICS countries.

This may provide an attractive way of licensing for IPR-owners who are afraid that the licensing of their technology would harm their strategic interests at home, while on the other hand willing to provide royalty free licenses if this is not the case.

An example of a complex agreement on geographical licensing and royalties that has garnered general acceptance can be found in the agreement between UC Berkeley, iOWH and Amyris for the production and development of Artemisinin which is a key precursor in the production of artemisinin combination therapies for malaria (Stevens, 2011). UC Berkely granted iOWH a royalty-free license for the

manufacture of the artimisinin-based malaria treatments used in the developing world as well as for future IP. It also granted these licenses to Amyris and included the developed world in the license. However, the use of the IP in the developed world as well as for nonmalaria indications in the developing world is not royalty free. Finally Amyris is to grant iOWH a royalty-free license for the use of developed intellectual property for malaria treatments in the developing world.

5.7.2 Number of Uses

In this category, IPR-owners may give a license to the GCF for a one-time use of their technology. An example could be the construction of a bio-ethylene factory.[4] Consider a scenario in which a specific party in a specific country that will receive a grant from the GCF to implement a bio-ethylene technology asks an IPR-owner for a license. Instead of charging a commercial fee for the use of its technology, the IPR-owner may prefer to be involved in the construction of the factory. It offers to provide the technology for free, on the condition that it can build the factory in partnership with the local parties. The reason for the IPR-owner to engage in such a scheme is clear: it would not have to pay for (all of) the costs of a factory in which it can work out its own technologies.

5.7.3 Commercial/Non-Commercial

IPR-owners that donate licenses to their technologies may require that they only be used for humanitarian purposes. It seems fair that an IPR-owner who has invested resources in his invention should have the right to profit-yielding markets. When such an owner is willing to give up some monopoly rights, that owner cannot be expected to compete against himself. It has however been pointed out that this argument does not hold in two situations: (1) where the market exists in a country that is of no strategic importance whatsoever to the IPR-owner and (2) where a market would only be of interest when it would develop to a certain volume. However, in the absence of that volume the market is to small for the IPR-owner but could be of interest to local parties.

Brewster, Hansen, and Chapman (2011, p. 48), also in the PIPRA Handbook, provide an example to "illustrate that it is possible to make IP available for research and commercialization in developing countries." The example concerns vitamin-A-enriched Golden Rice that involves around 45 patents by 30 companies. These patents were licensed to Greenovation, the company that is owned by the golden rice inventors and Greenovation licensed its IP exclusively to what is now Syngenta. Subsequently Syngenta licensed Greenovation to allow them to license Golden Rice

[4] Personal conversation with, IP manager of DSM company, January 2011.

technologies to developing countries. In this arrangement also other companies that held Golden Rice-related patents were involved. The arrangement allows Greenovation as well as Syngenta to grant licenses to any research organization. The rice can be used royalty free and farmers are allowed to earn up to $ 10,000 a year, if they sell more they have to acquire a commercial license from Syngenta.

5.7.4 For One or More Projects

The most generous way of licensing technology to the GCF is when it is accompanied by a condition that it can be used for all projects by anyone. Depending on the sub-license conditions of the GCF this could result in a semi-open license, like that for Golden Rice as the GCF would hand out licenses to all (but only to) parties that fit its quality requirements. It seems however more likely that when the GCF wants the industry to be involved it should also provide them with the option that their licenses can only be used in relatively rare cases when the GCF funds (parts of) the project. The upshot is that when an IPR-owner licenses its technology to the GCF it may be expected to not want the license to interfere with its commercial interests and will expect the GCF not to hand out the technology to every party but only after a quality assessment of that party.

5.7.5 Pool/Non-Pool

The pool-system is the most ambitious licensing model as it would come down to a "climate change technology pool." Although it may not seem likely that IPR-owners are willing to provide licenses to other IPR-owners that could be competitors, the fact that all parties have to provide cross licenses to each other, might solve that problem. A second barrier to this system might be that IPR-owners are reluctant to donate those licenses to technology that they consider to be of strategic interest and "the pool" may therefore end up in existing of worthless licenses. However, the system could still be attractive for industries that rely heavily on cross-licensing and for public research institutions. The added value of a "pool-option" at the GCF instead of a separate pool that is managed by the industry is that this pool will exist within the "IP-hub" and pooled-technology can therefore be easily linked to non-pooled technology that is licensed to the GCF on different conditions.

5.8 Conclusion

It is undisputed that technology transfer to developing countries involves many more issues than IPRs, but the argument that IPRs are therefore irrelevant overlooks a number of crucial facts. Technology transfer requires proactive policies in

countries where that technology is protected by IPRs. Therefore they should be not absent from the climate change negotiations. Attaching an IPR-policy to the upcoming GCF would allow it to act as an IP-hub when it collects licenses to relevant technologies for its beneficiaries. The scale of the GCF and the option to integrate the license policy with the technology transfer mechanism provides some guarantee that these licenses would not be shelved but could become building blocks for the transfer of CCTs to developing countries. Based on expert opinion gathered in workshops and interviews we have provided a scheme with categories that could work in this complex arena. The next step forward is to work out a road map to make this global IP facility reality and to study further in which industrial sectors it could make the largest difference.

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Chapter 6
The Benefits of a Sustainable Energy Trade Agreement (SETA)

Joachim Monkelbaan

Abstract Access to affordable, sustainable energy and the issue of climate change are set to become key concerns for business. This chapter describes how improved trade governance can help businesses to massively ramp up the development of sustainable energy. The chapter shows that there is considerable momentum for different trade-related initiatives and in particular for an Environmental Goods Agreement, the major part of which would cover sustainable energy technologies. It explores in more detail why business should follow the developments in this field closely and discusses some promising ways forward.

6.1 Why Sustainable Energy Trade Initiatives?

A rapid scale up and deployment of renewable or sustainable energy sources could significantly reduce the emissions responsible for climate change. It would also help countries as they strive to provide access to sustainable energy for all,[1] enhance their energy security and independence,[2] and achieve the Millennium Development Goals[3] and their follow-up, the Sustainable Development Goals. Lower prices for

[1] There are 1.6 billion people without access to modern forms of energy today.

[2] E.g., rural children can study at night with solar-lighting facilities, even without access to grid-based electricity. Better access to modern cook-stoves such as those based on solar or cleaner biomass fuels can reduce mortality from indoor air-pollution caused by inefficient firewood or charcoal-based cooking and can also halt deforestation caused by firewood collection.

[3] E.g., a reduced dependence on gathering firewood would free time for more profitable activities and would also contribute to empowerment of women. Without access to modern energy, it will not be possible to achieve the Millennium Development Goals, whether reducing poverty, improving women's and children's health, or broadening the reach of education.

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sustainable energy goods and services (SEGS) can contribute to green growth, competitiveness and a reduction in taxpayer support for energy, freeing up government resources for other purposes.

Efforts to scale up sustainable energy require generation costs to be as low as possible. Relatively high up-front capital costs associated with renewable energy investments, the non-consideration of environmental and health externalities in fossil-fuel pricing, and the existence of fossil fuel subsidies make this a challenging proposition as they keep the costs of renewable energy higher than those of fossil fuel-based energy (Jha, 2013). This hinders renewable energy from becoming a viable alternative to fossil fuels by preventing economies of scale and affordability of renewables.

The development of sustainable energy will require a supportive enabling environment based on clear and coherent governance regimes for related goods and services. Currently there is no dedicated framework or policy process for trade in SEGS. However, governments often combine renewable energy goals with objectives such as stimulating domestic industry and jobs in ways that are not compliant with WTO law and the basic rationale of economic efficiency. Limiting imports can limit competition and access to the required technologies, drive up prices and in the end lower demand for SEGS. Protectionism and concerns about unfair competition can also lead to the trade-related tensions and indeed trade disputes on issues related to renewable energy which we have recently seen increasing. For example, the EU and the US put anti-dumping tariffs in place on solar panels from China, and China in turn took measures against imports of polysilicon from a variety of countries. Also a flurry of disputes related to sustainable energy has come up at the WTO, with arguably the most notable one being the one in which Japan and the EU successfully complained about local content requirements (LCRs) for renewable energy technologies in Ontario.[4] The WTO's Appellate Body indeed confirmed that LCRs are unacceptable under WTO law. SETIs can play a useful role in preventing the escalation of trade disputes and can improve predictability for businesses.

The WTO, otherwise a natural candidate to take on the challenge of creating an enabling regulatory framework for sustainable energy and trade, is currently hampered by the standstill in the Doha Development Round. Thus, it is necessary to explore and promote alternative initiatives, with a view to an eventual integration within the WTO framework. These possibilities include a stand-alone Sustainable Energy Trade Agreement (SETA), designed to holistically address barriers to trade in sustainable energy technologies. They could also encompass other forms of regional and/or sectorial initiatives to address trade in sustainable energy goods and services, Sustainable Energy Trade Initiatives (SETIs).

The concept of a SETA originates from the Global Agenda Council of the World Economic Forum. Its analytical case has been developed since 2011, primarily by ICTSD and its partners.

[4] For a short overview of this case, see http://ictsd.org/i/news/bioresreview/164805/

6.2 Current Momentum for SETIs

There is considerable momentum for Sustainable Energy Trade Initiatives. The most tangible example is important movement in Asia Pacific Economic Cooperation (APEC). In November 2011, APEC-economies issued a declaration to develop a list of environmental goods, on which applied tariffs should be reduced to 5 % or less by the end of 2015 (APEC, 2011). In addition, the declaration states that APEC economies should "… eliminate non-tariff barriers, including local content requirements that distort environmental goods and services trade." In September 2012, the member economies agreed to such a list, covering 54 tariff lines.

The developments in APEC have resulted in other, like-minded countries, getting together to discuss options for building on the APEC-agreement and to ongoing discussions in Geneva of the "Friends of EGS".

In June 2013, US President Barack Obama issued his Climate Action Plan, which includes a clear commitment for a Sustainable Energy Trade Initiative that is likely to make a decisive difference towards positive action:

> The U.S. will work with trading partners to launch negotiations at the World Trade Organization towards global free trade in environmental goods, including clean energy technologies such as solar, wind, hydro and geothermal. … Over the next year, we will work toward securing participation of countries which account for 90 % of global trade in environmental goods, representing roughly $481 billion in annual environmental goods trade. We will also work in the Trade in Services Agreement negotiations towards achieving free trade in environmental services (Executive Office of the President, 2013).

Following this statement, in January 2014, the outlook for an "Environmental Goods Agreement" received a major boost when a group of WTO Members[5] announced the launch of a new initiative[6] for eliminating tariffs on environmental goods. The major part of such an agreement is set to cover sustainable energy technologies and could be seen as a SETA. The EG Agreement is expected to have a status similar to the successful Information Technology Agreement (ITA) in the WTO. This means that agreement would be based on the "most favored nation" (MFN) principle; the benefits would be shared with all WTO Members, even those who do not sign up to the agreement.

USTR's Froman said at the launch of this initiative:

> Increased trade in environmental goods is an important part of President Obama's Climate Change Action Plan, a key objective of U.S. leadership in global trade policy, and a potential driver of job growth here at home. This new effort will build on the United States' work with Asia-Pacific partners to make renewable and clean energy technologies cheaper and more accessible for everyone, "(…)" This effort among like-minded WTO partners will also help to maintain momentum in Geneva for the kinds of fresh, credible approaches to trade negotiation and results that led to success at Bali last year (USTR, 2014).

[5] Australia, Canada, China, Costa Rica, the European Union, Hong Kong, Japan, Korea, New Zealand, Norway, Singapore, Switzerland, United States and Chinese Taipei.

[6] The text of the final joint statement can be found at http://www.ustr.gov/sites/default/files/EGs-Announcement-joint-statement-012414-FINAL.pdf

The group of WTO Members participating in this initiative account for 86 % of global trade in environmental goods. The group has already begun to reach out to other countries to encourage them to join the initiative, with the objective of bringing all major traders into the negotiations. The initiative announced today will also complement efforts to remove barriers to global trade in environmental services, as part of the Trade in Services Agreement (TiSA).

In parallel, the EU is taking concrete action to address trade in sustainable energy technologies, negotiating annexes on clean technology in their on-going regional trade agreement discussions with members of the ASEAN (Singapore, Malaysia and Vietnam), and is reportedly planning likewise for upcoming RTAs with the US and Japan. The EU and China reached a mutually acceptable solution over the alleged dumping of solar panels on the EU market (European Commission, 2013).

6.3 Business Interests in SETIs

In addition to growing support for global political agreement on sustainable energy trade, the private sector is promoting solutions to facilitate the scale-up of sustainable energy. A good example is the "Business-20" Summits (B-20), an international forum aimed at fostering dialogue between governments and the global business community so as to contribute to the achievement of objectives of global economic growth and social development.

At the B-20 meeting in Puerto Vallarta, Mexico, in May 2012, the B20 Green Growth Task Force came out with a set of recommendations that highlights, *inter alia*, the importance of a SETA (B20, 2012). The text notes that promoting free trade in green goods and services and establishing arrangements to this end will create a tangible, positive incentive within the international trading system to develop and expand the use of green energy goods and services, thereby helping to accelerate progress on mitigating greenhouse gas emissions while promoting economic growth, access to energy, and energy security. Following this development, the government of Mexico brought the idea forward to the G20 at the Los Cabos-summit in June 2012. During the Mexican presidency of the G20 in 2012, a public-private partnership called the Green Growth Action Alliance (G2A2) was created, with the objective of leveraging investment in green infrastructure projects, and is being hosted by the World Economic Forum. The G2A2 has a working group on trade, which explicitly promotes the SETA.

One very concrete reason for the increased business and industry interest in further trade liberalization for sustainable energy goods and services is the fast growth of trade barriers and disputes that have evolved after the 2009 financial crisis. In a situation where mature markets are stagnating or growing slower, the renewable energy (RE) industry becomes more dependent on emerging markets and the competitive costs with respect to other energy technologies, in particular when the environmental and social costs of the use of fossil fuels are not internalized

(see, e.g., Sovacool, 2008). With serious market dynamics like this, the RE business must diversify to new markets and increase its cost of energy competitiveness faster. The RE industry becomes thus more dependent on open markets and scalability of its supply chains. This is a natural development of a maturing industry and has been the trend in the solar PV and wind industry the last seven to eight years where it has been possible to drive down cost of energy per MWH radically due to open international sourcing and supply chains. It would be very difficult to roll back this development of internationalization without major negative impact for cost of the sustainable energy technologies. This illustrates that SETIs are crucial for safeguarding low prices for sustainable energy, competition and market development.

Other benefits of SETIs for the private sector are:

- The possibility to influence companies' international lobbying strategy and focus
- Global alliance building reaching beyond single industry/single company agenda
- Strategic mitigation of increased regulatory risk in (emerging) markets
- Securing increased market volume and possibility of global scalability (market & supply chain planning) to deliver further reductions of cost of energy
- Larger returns on investment cash-flows to local economy because green/clean technologies don't need imported fuels (or less imported fuels)
- A level playing field for free sourcing and open supply chains securing the best prize/quality ratio for customers and end-consumers.

Overall, providing greater clarity on trade rules affecting the scale-up of sustainable energy will allow greater certainty and predictability that both government and companies need for making the long-term investments, which are so important for sustainable energy and which are growing rapidly (see Figs. 6.1, 6.2, 6.3 and 6.4 below).

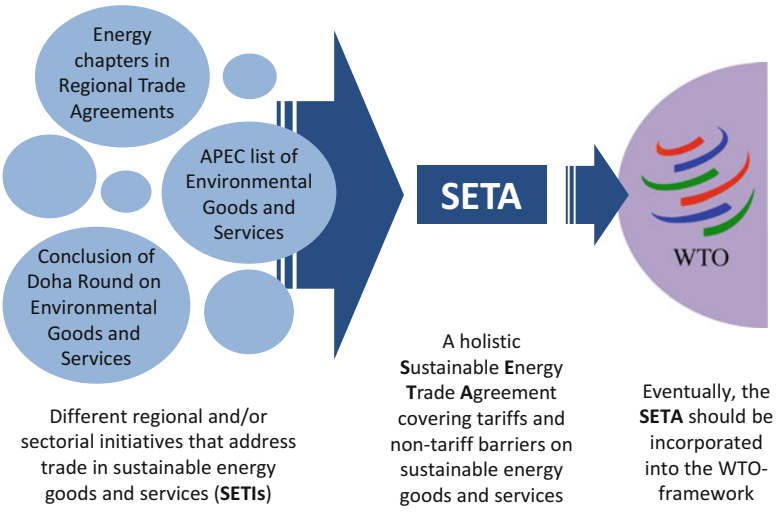

Fig. 6.1 The relationship between SETIs, a SETA and the WTO

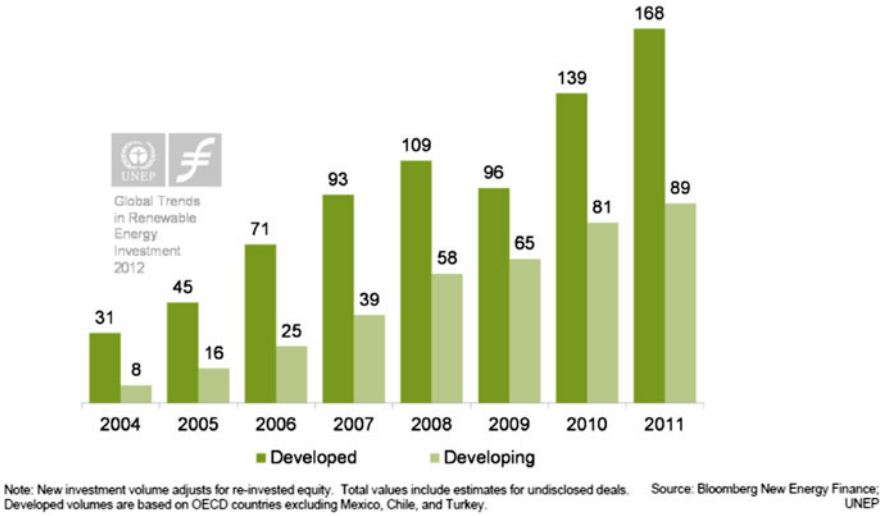

Fig. 6.2 Global new investment in renewable energy developed vs. developing (2004–2011). *Source*: UNEP and Bloomberg New Energy Finance, Global Trends in Renewable Energy Investment, 2012

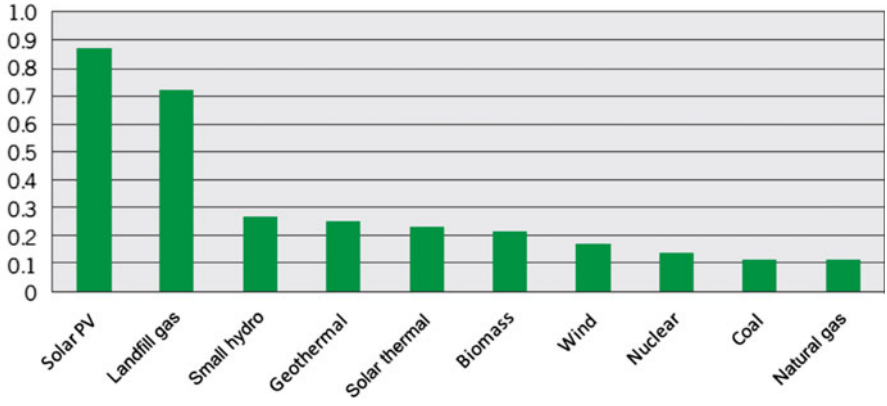

Fig. 6.3 Comparison of job-years across technologies (job-years/GWh). *Source*: Wei et al. (2010)

To realize the benefits for both the public and the private sector described above, ICTSD has created the "SETI-Alliance",[7] a public-private partnership that works constructively to support policy action in the area of SETIs. In 2013, the Alliance For Affordable Solar Energy (AFASE) decided to join the SETI Alliance, bringing the total number of corporate members of the SETI Alliance to more than 1,800.

[7] http://seti-alliance.org/

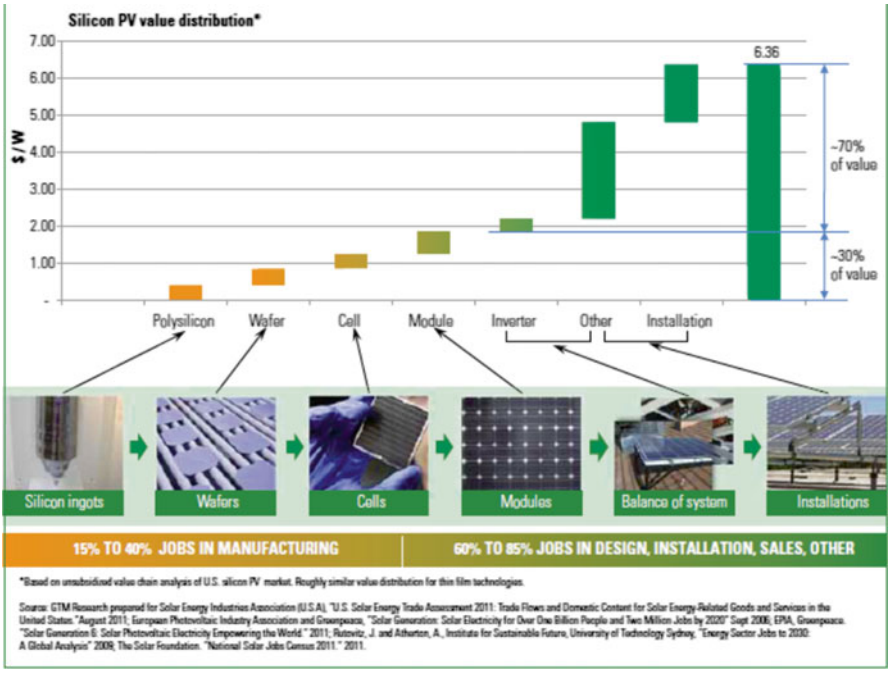

Fig. 6.4 The division of jobs and value along the supply chain of silicon PV

6.4 Legal Options for SETIs: Issues and Challenges to Consider to Implement a SETA Under the WTO Framework

According to Kennedy (2012), the main considerations to be taken into account when establishing a Sustainable Energy Trade Agreement, SETA, as an agreement under the WTO framework are:

- the scope of the SETA as a new WTO Agreement
- the rights and obligations towards non-participants and issues concerning the core WTO-principle of most-favored nation (MFN)
- the negotiation process and implementation of a plurilateral agreement
- dispute settlement and
- substantive rules

The SETA could follow the model set by either the Information Technology Agreement (ITA) or the Government Procurement Agreement (GPA).

6.4.1 SETA Following the Information Technology Agreement (ITA) Model

The ITA model allows for negotiations among a limited group of countries and gives effect to the outcome by adjusting Member's goods and services schedules. Consequently, MFN treatment is extended to all Members, meaning that even non-signatories to the agreement benefit from the concessions made by the parties to the agreement. As its subject matter is restricted to the General Agreement on Tariffs and Trade, GATT and the equivalent for services, GATS, the scope of an ITA type of agreement will be limited. Further, it may only yield rights and not diminish obligations of Members.

6.4.2 SETA Following the Government Procurement Agreement (GPA) Model

The GPA model requires adding the SETA to Annex 4 of the WTO Agreement, which contains plurilateral agreements under the WTO, by a consensus vote at the Ministerial Conference. The consensus vote will have to be considered if the SETA is negotiated according to the GPA model. The only substantial requirement is that it concerns a trade agreement. Hence, the scope is much broader than that of the ITA-model.

The SETA as an agreement added under Annex 4 falls under the MFN obligation when the subject matter covered by it falls under the scope of GATT Article I:1 or GATS II:1. That is very likely to happen with a SETA, certainly with an ITA-type agreement and even under a GPA-type agreement. Any decision to add SETA to Annex 4 should address MFN treatment specifically in the interest of certainty. It must be borne in mind that the reason the benefits of the GPA were limited to participating members was because the subject of government procurement does not fall within the scope of Article I:1 of GATT 1994 or the other MFN obligations in the multilateral WTO agreements.

It is possible that the obligation to grant MFN treatment to non-parties of a SETA might impede countries from joining the agreement. However, obtaining an exception from MFN treatment, possibly through granting a waiver, could hinder the consensus decision of the Ministerial Conference to add the agreement to Annex 4.

6.4.3 SETA Negotiations Within the WTO

Formal negotiations within the WTO have to be launched by a consensus decision, to help ensure transparency and openness. Transparency towards non-parties is likely to play a role in the decision to add a SETA under Annex 4. Further, negotiations on a SETA would institutionally not be part of the current round of trade negotiations, the Doha Development Round.

Participants will have to assess the criteria to define the critical mass necessary for the implementation of a SETA. The critical mass is dependent on several factors: the characteristics of the market for relevant equipment and services, the countries most responsible for CO_2 emissions, and the percentage in share of world trade of the relevant sustainable energy goods and services.

In the multilateral spirit of the WTO, any WTO Member should be able to access to the SETA. An accession clause should be expressly included in the agreement. Accession can be allowed on the same terms that applied to the original parties or negotiated terms. The disadvantage of the latter is that potential new members probably already enjoy the benefits of the agreement through the application of MFN and have therefore fewer incentives to negotiate their accession to the agreement. Accession on the same terms can promote wider acceptance of SETA. However, it also reduces the incentive to participate early and thus hinders effective implementation.

6.4.4 Dispute Settlement Procedures

If the SETA were to be based on the ITA-model, commitments would become effective through Member's goods and services schedules and become integral parts of GATT and GATS. Other provisions of these agreements would apply, including the Dispute Settlement Undertaking (DSU) and little or no further consideration would be necessary.

If SETA were to be based on the GPA, the DSU can only apply when the parties include a provision for the application of the DSU, the Ministerial Conference adopts a decision by consensus to amend the list of Covered Agreements of the DSU and the parties notify the dispute settlement provisions of SETA to the Dispute Settlement Body (DSB). DSU Article 2.1 would imply that only parties to the SETA have third-party rights and can participate in decisions or actions taken by the DSB with respect to disputes under the SETA. The SETA can provide for a special rule to grant rights to Members that are not a party to the agreement.

When a dispute arises under both the SETA and other multilateral WTO Agreements, the DSU could be amended to protect the rights of non-parties to the SETA.

Sustainable energy technology and production is rapidly changing. It is likely that amendments to the SETA might be needed in the future. Amendments to Annex 4 agreements have to be made according to the provisions in that agreement. When adding the SETA to the list of Covered Agreements under the DSU, an indication should be made whether it covers future amendments as well.

6.4.5 Substantive Rules

An Annex 4 agreement is allowed to add and diminish rights and obligations among the parties of that agreement without affecting the WTO rights of non-parties. However, the rights of non-parties could be affected through interpretation of the

WTO's Covered Agreements. In cases of overlap between SETA and a multilateral agreement the rights of third parties will be affected through the interpretation of overlapping provisions. In order to avoid diverging interpretations, it is important to include conflict provisions on how the different WTO agreements interrelate or a saving provision stating which rights and obligations under the multilateral agreement are not affected by SETA.

For instance, because a SETA could include rules on subsidies, it has to clarify the relationship with the Agreement on Subsidies and Countervailing Duties (ASCM). A SETA can add to the discipline on subsidies by covering classification of energy and energy-related subsidies, which are not yet covered under the ASCM. Next, a SETA can expand or clarify the definition of a subsidy in ASCM Art 1. It can also expand the category of prohibited subsidies under ASCM Art. 3 beyond export subsidies and import substitution subsidies. A SETA might diminish the subsidies discipline, but this would be less effective because of the plurilateral basis of the agreement. For example, if the SETA would include a new category of non-actionable subsidies, they will only be non-actionable for the parties to the agreement and not beyond. If SETA parties decide to give subsidies that under the SETA are non-actionable, they still can be subject to countervailing duties and to WTO dispute, after which subsidies would have to be removed.

With regard to exceptions, a SETA can take the structure and concepts of the general exceptions provided for in GATT XX and GATS XIV. Because a SETA does not bind non-parties, they still enjoy their rights under the multilateral agreements, which can undermine derogations from certain obligations.

6.4.6 Implementing a SETA Outside the WTO Framework

An alternative implementation of a SETA could be outside the WTO framework. This could imply the establishment of another institutional framework and a dispute settlement mechanism. Possible conflicts with the WTO with regard to jurisdiction and substantive law have to be taken into consideration because even if SETA would not fall under the WTO framework, the WTO rules still apply.

First, when the SETA is concluded outside the WTO, members could deviate from the MFN principle if the SETA meets the conditions of a preferential trade agreement, set out in GATT XXIV, GATS V or the so called Enabling Clause which allows for granting of preferences in favor of developing countries.

Since the SETA would only liberalize trade in a very particular sector (i.e., sustainable energy goods and services) and not cover a majority of trade between the members, it is unlikely that the SETA would qualify as a WTO compliant preferential trade agreement.

Second, the WTO does not oblige parties to agree that the SETA be added to the WTO Agreement, nor does it prohibit the agreement to exist when no consent of adding it is given. Article 41 of the Vienna Convention of the Law of Treaties (VCLT)

allows parties to a multilateral agreement to modify the rights and obligations among themselves, outside of the framework of the multilateral agreement, as long as they do not affect the rights of members not party to that modification. This is exactly what a SETA could do. Article 42 of the VCLT only requires parties to notify the members of the multilateral agreement of the modifications.

Third, a last challenge for an agreement outside the WTO framework is to work out solutions for possible conflicts of substantive norms and jurisdiction with the WTO dispute settlement. A SETA should include a conflict provision to take away the uncertainty in case of conflict with substantial WTO rules. It could state that the SETA prevails. In WTO dispute settlement however, only WTO law would be applicable. A jurisdictional clause such as a fork-in-the-road provision in the SETA can take away the risk of conflict between a SETA dispute settlement system and the DSU.

6.4.7 Local Content Requirements

The combination of the financial crisis of 2008 together with inadequate international policy momentum on agreed policies to achieve sustainable economic development contribute to a new form of protectionist trade policy, namely local content requirements (LCRs) devised at the national level as a tool of green growth policy. Local content requirements typically require a certain percentage of intermediate goods used in the production processes in renewable energy projects to be sourced from domestic manufacturers. LCRs are often coupled with other policy measures to encourage green growth.

On the legal side, support schemes with LCRs for renewable energy are generally prohibited under WTO law as they violate several WTO provisions, namely the national treatment principle in Article III:4 of the General Agreement on Tariffs and Trade (GATT) and Article 2.1 of the WTO's Trade Related Investment Measures (TRIMs) Agreement. In addition, they might constitute "prohibited subsidies" under Article 3.1(b) of the Subsidies and Countervailing Measures (SCM) Agreement (Kuntze & Moerenhout, 2013).

Guidance on the legality of feed-in tariffs for RE development can be drawn from the recent decision of a WTO Appellate Body in the Canada—Renewable Energy case (WTO, 2013). Contrary to support schemes with LCRs, procurement tenders that contain LCRs, however, will hardly be disciplined by WTO law and may therefore be permissible (see also section on "Trade Law Implications" below).

Despite the questionable nature of LCRs under WTO rules, both developed and developing countries have turned to local content requirements. Public financing for low-carbon energy policies has been squeezed, while governments feel the need to address the pressing concerns of climate change and environmental degradation. LCRs are viewed as an attractive policy tool for the promotion of renewable energy. However, given their potential trade distortive impacts, it is imperative to address the effectiveness of LCRs in achieving green growth objectives.

Although over one hundred LCRs have been imposed since 2008, only about twenty have been applied in the renewable energy sector. These may have impacted approximately $100 billion of international trade. The effectiveness of these measures is hard to evaluate, as they have been in place in the "green" sector for only a short time (Kuntze & Moerenhout, 2013).

Proponents argue that LCRs can be used to address valid environmental objectives in a context of limited financial resources, allowing firms the breathing space to reach a sustainable scale of green energy output and providing for the creation of "green" jobs. They also claim that LCRs will spur innovation in the renewable energy sector in the medium term and consequently lower green technology costs.

Opponents of LCRs in renewable energy policies point to the economic costs—inefficient allocation of resources, higher retail power prices, a negative impact on trade—and question as well the environmental gains in the medium-term and the ability of LCRs to create green jobs.

Given the potential trade distorting effects of LCRs and their questionable status under WTO rules, there are alternative options for achieving the sustainable energy, employment and economic growth benefits that LCRs are called upon to address. These include enhancing physical infrastructure, promoting government-sponsored financing, taking better advantage of progress in renewable energy production, and promoting innovation and training for green jobs. Countries concerned about this policy tool might agree to focus their WTO disputes on LCRs outside the renewable energy sector.

A SETA is an attractive solution to coordinate national policies with the goal of lowering the cost of renewable energy policies. For example, a SETA could contain non-renewable time limits for existing LCRs, a moratorium on the adoption of future LCRs, the capping of LCR percentages and an agreed "phase-out" period during which countries might agree to include their partners in a "regional content requirement" so that such cumulation would reduce the trade distortive impact of these measures.

6.5 Technology Diffusion in a SETA

While some opportunities for increased international technology cooperation can be exploited in existing institutional venues such as the United Nations Framework Convention on Climate Change (UNFCCC), others may require the creation of new international institutional arrangements. There is no single institutional setting, nor even only one type of institutional architecture, that can fully exploit the gains from increasing the international diffusion of sustainable energy technologies. From a macro perspective as well as a micro perspective, international technology diffusion is inherently embedded in international trade, investment and licensing flows (Brewer, 2012).

This is why a SETA can address the barriers to technology diffusion while simultaneously promoting the diffusion of sustainable energy technology in an active way. A SETA should have a broad scope in terms of its coverage of industries and

technologies. It should initially include energy supply technologies and can later expand its scope to energy efficiency technologies. Reducing non-tariff barriers on international services and direct investments will have a big effect on technology transfers in the form of know-how. To address the promotion of technology diffusion, a SETA must balance government policies that facilitate innovation and investment in the sustainable energy sector against their possible trade distortive effects. While a pragmatic approach may be to gain clarity through the WTO dispute settlement cases, another more meaningful and durable option is to create a new international institutional architecture based on mutual benefits.

Trade, investment and licensing, together with technology diffusion are central to sustainable development processes. Together, they represent a tightly integrated economic package. It is particularly important to address the issues associated with all the modes of technology transfer used by firms, namely international direct investments, licensing, and trade in goods and services. Global markets for sustainable energy services are bigger than markets for sustainable energy goods. Services are directly related to job creation, and trade in services is crucial for knowledge transfer and capacity building. Because international direct investments and international services transactions are integral to technology diffusion processes, a SETA agenda should include non-tariff barriers to these modes of international technology diffusion, in addition to tariffs on goods and barriers to licensing (Brewer, 2012).

Energy efficiency technologies are often the most cost-effective ways to reduce greenhouse gas emissions and dependence on fossil fuels. According to the International Energy Agency (IEA), the volume of emissions that can be mitigated through energy efficiency is greater than that delivered through the use of renewables. A SETA agenda should therefore include the numerous, diverse and expanding lists of energy efficiency technologies that could make a significant contribution to sustainable development.

Government procurement practices and *subsidies* are important factors in the supply and demand for sustainable energy technologies and international diffusion of them. Although countries that are signatories to the existing WTO Agreement on Government Procurement cover some sustainable energy technologies, there are significant gaps in its coverage in terms of both technologies and countries (Herve & Luff, 2012). In particular, at the level of fundamental research, there are market failures because of greater interest in the earlier phases before bringing a product to the market. Government support for fundamental research can be justified in many such instances, creating further benefits because such support is less trade distortive than support for manufacturing.

Standards and testing are inherently problematic in the context of trade policy issues because of concerns about disguised protectionism (Rai & Payosova, 2013). In the context of sustainable energy technology diffusion, they are even more problematic because the technologies themselves are rapidly evolving, and in many cases need to be integrated in a unified grid. Standards and testing procedures are therefore in a state of flux in many instances. Government subsidies of sustainable energy projects by technology exporting and importing countries can be justifiable on economic efficiency grounds because of market failures. A SETA agenda should

therefore not only be about trade liberalization; it should also be about finding a balance between the roles of governments and markets. Achieving such a balance is one of the most analytically and politically challenging topics for a SETA. A new paradigm about the role of government in economies, including international trade, is needed in order to adequately accommodate the legitimate role of subsidies in facilitating economic efficiency where there are market failures.

6.5.1 What is the Role of Developing Countries?

Many emerging and "developing" countries are significant exporters as well as importers of sustainable energy technologies. As a result, the political economy of the patterns of interests and influence in international negotiations of a SETA are changing. Developing countries' increasing interests as technology exporters create incentives to participate in agreements that would reduce barriers to international diffusion of sustainable energy technologies. At the same time, those countries' expanding role in the world economy enhances their influence in international negotiations. Technology exporting countries such as China, Hong Kong (China), Mexico, Singapore and Thailand can be expected to be more supportive of a SETA. Technology importing countries are more reluctant to trade liberalization initiatives. An important element to get these countries on board on SETA might be to include provisions on capacity building and technical assistance that can be provided to developing countries.

Particular challenges that developing countries face in this field are high capital costs, the ease of access to finance, slow rates of policy implementation, high import duties and taxes, difficulties in after-sales service and distribution arise, and improper implementation of standards.

Business can play an important role in addressing these challenges, for example through innovation in business models ("pay-as-you-go" model or a rental model), give access to finance innovation, and support certification, testing, and product customisation based on individual consumer preferences without sacrificing quality (Nampoothiri & Manoharan, 2013).

6.5.2 How to Accommodate Technological Change?

The emerging energy technology revolution is also changing the international political economy of sustainable energy technology diffusion. New and evolving technologies are changing international trade, investment and technology diffusion patterns. As such patterns change, it is important that a SETA agenda be flexible so that it can expand to include new technologies.

As a trade agreement, a SETA can create artificially scarce or "club" goods and thereby incentives for countries to participate in it and comply with its norms. Additionally, a SETA could include provisions on capacity building and technical assistance, and could refer to existing agreements on technology cooperation.

6.6 Trade Law Implications of Procurement Practices in Sustainable Energy Goods and Services

Why are government procurement and the WTO's Agreement on Government Procurement (GPA, 1994) important in the Relationship between Trade and Sustainable Energy? The answer is that governments are a major consumer of goods and services, including those focused on sustainable energy, and can therefore play an important role in steering the consumption of sustainable energy. Traditionally, government procurement has generally been used as a policy tool to favor domestic producers. Therefore, because of their effect on trade, these practices have been addressed in WTO law and more particular in the GPA. The UN's Model Law on Procurement of Goods, Construction and Services (UNCITRAL, 1995) and other regional non-binding instruments are an attempt to regulate public procurement as well. Additionally, many Free Trade Agreements (FTAs) include "WTO-plus" obligations to regulate public procurement.

As the GPA is a plurilateral agreement, it only creates rights and obligations for WTO Members who have signed the agreement. Each party to the GPA has specified which government entities will be covered by the rules of the agreement.

6.6.1 Can Governments Proactively Favor Sustainable Energy Goods and Services to the Exclusion of Their Non-sustainable Counterparts?

Favoring the procurement of sustainable energy goods and services, SEGS, may be seen in some situations as discriminatory practices. If a procuring country is party to the GPA and the procurement is covered by its list of GPA commitments, discriminations favoring SEGS in public procurement can therefore be successfully challenged under the GPA. However, the GPA offers some flexibilities, providing that the procurement procedures are applied in a non-discriminatory manner. For example, government entities are not required to award the contract based on the lowest price but can choose the "economically most advantageous" tender, which leaves room to take other policy objectives into account. Even if a procurement practice is considered discriminatory, a country can invoke the exception provision under the GPA, which mirrors the exceptions under article XX of the General Agreement on Tariffs and Trade (GATT, 1994). These exceptions allow a country to take certain "measures necessary for the protection of human, animal or plant life" as long as these don't constitute a means of "arbitrary or unjustifiable discrimination between countries where the same conditions prevail," neither a disguised restriction on international trade.

If the procuring country is not party to the GPA, a challenge against discriminations favoring SEGS might be more difficult (Herve & Luff, 2012).

6.6.2 *How Can a SETA Clarify Ambiguities and Enable a More Supportive Framework for SEGS Procurement?*

A Sustainable Energy Trade Agreement, SETA, can take into account the possible discriminations favoring SEGS and provide for the legal basis to allow and to promote SEGS-related procurement. A SETA should provide for a clear definition of SEGS. A SETA could furthermore include an acknowledgement that products and services complying with SEGS requirements, defined in the SETA, are different from products and services that do not comply with these requirements. This would allow countries to treat them differently without having to rely on the exception provisions.

6.7 Clean Energy Subsidies: What, Why and How Legal?

This section deals with the fundamental tension between promoting energy access while reducing fossil fuel subsidies and maintaining the integrity of international trade rules. Subsidies can consist of a direct financial transfer, preferential tax treatment, government regulations giving incentives for investment, physical infrastructure, access to natural resources. Trade restrictions against foreign competitors can offer a competitive advantage to domestic producers as well.

Clean energy subsidies can simultaneously support access to energy and speed up the transition to a lower-carbon economy. However, depending on their design, subsidies can have a trade distorting effect and hinder trade in sustainable energy goods and services by giving an unfair advantage to domestic producers. Any attempt to address energy trade and access through a Sustainable Energy Trade Agreement (SETA) must incorporate this tension and set clear rules on subsidization (Ghosh & Gangania, 2012).

6.7.1 *Arguments in Favor of Clean Energy Subsidies and Policy Tensions*

There are four main arguments frequently stated in favor of subsidization of clean energy:

1. The desire to increase energy access and the recognition of the market failure caused by existing subsidy schemes that favor conventional, polluting sources of energy
2. An incentive for the development of a new industrial sector
3. Job creation in industrial, manufacturing and services sectors
4. Creation of a level playing field between the domestic industry and subsidized firms in other countries, so as not to lose competitiveness (Ghosh & Gangania, 2012).

However, there are several policy tensions surrounding clean energy subsidies:

1. *The Environmental Imperative*: the support needed to cover the incremental costs to enable clean energy sources to reach "grid parity" or cost comparability with fossil fuel energy sources. The tensions arise from the question of how the incremental costs will be covered, and whether the financial support will be sustained over a period sufficient to scale up deployment of new and emerging clean energy technologies. Many countries will also desire flexibility in terms of pathways to pursue a "green" and "low-carbon" economy and this will determine how clean-energy subsidies are governed. However, different types of subsidies may also have differential impact on consumers, project developers, and equipment manufacturers at home and abroad.
2. *The Technology Imperative*: Technological initiatives including research, development and deployment through, for example, joint-venture partnerships will require some form of support. The question is how partner countries can or should support these joint ventures, such as through direct financial transfers or by contributions in kind—and how the fruits of such labor are to be shared.
3. *The Economic Imperative*: Countries may resort to subsidies to ensure economic viability and attractiveness of the renewable energy sector for investors, particularly during times of recession. However, periods of recession could also see subsidies that assume mercantilist purpose, especially if domestic industrial development, manufacturing capacity and employment generation come at the expense of other countries. Governments, and firms, are interested not only in the collective good of cleaner, low-carbon energy, but also in industrial and economic competitiveness.
4. *The Trade Imperative*: Mercantilist policies discriminate between foreign and domestic firms within a country. They can also discriminate between imported clean energy products and local manufactures. Subsidies could be granted to promote clean energy exports, making domestic firms more competitive in the international market. The impacts of such policies are already being felt today, leading to high-profile trade disputes between countries such as Canada vs. EU & Japan and China vs. the US &EU.

6.7.2 WTO Rules on Subsidies

The rules on subsidies under the WTO Agreement and in particular the Agreement on Subsidies and Countervailing Measures (ASCM, 1994) prohibit export subsidies and import substitution subsidies. They further allow for action under the WTO's Dispute Settlement Undertaking (DSU) or through countervailing duties when a subsidy is specific and causes adverse effects on other countries (ASCM Art 2). ASCM Art 8 included a list of non-actionable subsidies such as for R&D and environmental protection but this provision has lapsed in 2008. It is unclear whether the exceptions of Art XX of the General Agreements of Tariffs and Trade, GATT, for environmental or health protection, could apply to the ASCM.

Individual country policies, emerging disputes and lack of clarity on exceptions to WTO rules underscore the tension between maintaining non-discriminatory trade practices while also promoting greater and faster adoption of clean energy. Different solutions can be offered in this regards to offer legal and policy clarity to reconcile this fundamental tension.

6.7.3 How Can a SETA Help Policy-Makers?

A SETA will provide a forum for policy makers to discuss and resolve subsidy issues that are crucial to trade in sustainable energy goods and services. First, a SETA could clarify rules for sustainable energy in which not only the adverse and non-adverse impacts on other countries but also the purpose of the measure can be taken into account. Second, subsidies could be defined and measured in a transparent way to allow them to be compared, minimizing potential for misinterpretation or future disputes. Third, the relationship between rationalizing fossil fuel subsidy programs and the use of subsidies to promote clean energy sources should be further investigated. Fourth, the purpose of and reasoning behind subsidizing clean energy have to be discussed (See Fig. 6.2 below for examples). Finally, independent assessments of alleged adverse impacts of subsidy policies could reduce the threat of unilateral trade sanctions or other penalties and could happen through the WTO Trade Policy Reviews, the Committee on Regional Trade Agreements or the United Nations Industrial Development Organization.

6.8 Sustainable Energy Services

Although the size of the market for sustainable energy services is bigger than the market for related goods, and such goods and services are often traded in tandem, services related to sustainable energy are largely neglected in international negotiations. Services related to sustainable energy should be a key component though of SETIs and an eventual SETA (Monkelbaan, 2013).

Renewable energy in itself is associated with green jobs creation. Indeed, renewable energy tends to create relatively more jobs than traditional fossil-fuel energy. In addition, many of these job opportunities will take place in the countries of energy generation, for instance with activities such as installation and maintenance.

Including services in a SETA, however, poses a number of challenges. The first of these challenges lies in identifying a reasonable set of sustainable energy-related services that could be subject to trade liberalization negotiations. Given that these services are spread across multiple sectors, identifying such services could be a daunting task. “Complementary services of sustainable energy technologies” cut across multiple key mitigation sectors identified by the IPCC—i.e., energy supply, transport, buildings, and industry—and largely fall into the following Central

Product Classification (CPC) groups: other professional, technical, and business services; construction services; and other environmental protection services.

Because some sustainable energy goods are indispensable for delivering these associated services, and vice versa, another challenge arises from the current disconnect between negotiations on environmental goods and negotiations on environmental services in the framework of the WTO. One incentive for including trade in sustainable energy services in a SETA is that this could both facilitate the diffusion of associated sustainable energy technologies and enable countries to easily obtain access to such services and the related knowledge transfers. This is significant, since some of the key services and capacities required for sustainable energy production and use are often unavailable in the countries hosting the projects.

The lack of progress in environmental services negotiations on the issue of classification is another challenge, because it weakens the incentive for WTO members to schedule meaningful commitments in supporting action on sustainable energy.

It is important to identify services that are directly linked to the diffusion of sustainable energy technologies and to analyze specific commitments made by the major trading countries of these services.

After reviewing major trading countries' specific commitments to liberalize trade in these services, it becomes clear that only a handful of such countries have made commitments across all modes of supply. The principal modes of supply for the complementary services of sustainable energy technologies are "commercial presence" (Mode 3) and "movement of natural persons" (Mode 4). Yet, these modes of supply appear to be largely limited, as the majority of countries concerned have put specific as well as horizontal limitations on them. Members' commitments on "cross-border supply" (Mode 1) across all three CPC groups are becoming increasingly important for the facilitation of trade in these services, as the provision of services through Mode 1 is increasing along with new channels of electronic supply. The majority of trading countries concerned, however, left this mode of supply unbound, as they considered it inapplicable, particularly in the case of construction services.

Services regulation has connections to many other issues in a SETA. Facilitating trade in "services complementary to sustainable energy technologies" goes beyond the boundaries of the General Agreement on Trade in Services (GATS), as it is not limited to the issue of market access and national treatment. Domestic legislation, regulatory measures, and administrative rules could also affect trade in these services. In particular, because the public sector is the largest client in these sectors, regulations concerning government procurement could have a significant impact on trade in these services. Addressing the issue of trade liberalization in complementary services of sustainable energy technologies in tandem with government procurement issues is crucial in the development of a SETA. The WTO Government Procurement Agreement (GPA) has just been renegotiated. The text[8] now covers services. The key question is the extent to which a GPA party includes particular

[8] The text of the GPA, as amended, and the market access results of the negotiations are in GPA/113, http://docsonline.wto.org/imrd/directdoc.asp?DDFDocuments/t/PLURI/GPA/113.doc

services within the scope of its market access offer. Most GPA parties' market access coverage includes only procurement of services on a positive list; only the United States (US) uses a negative list approach in this context. Most or all parties cover services in the GPA with respect to another party only to the extent that the other party has provided reciprocal access to that service.

Bilateral, regional, and unilateral liberalization of services has advanced in the wake of the lack of progress on members' new commitments across the three CPC groups of services during the Doha Round. Most recently, the negotiations on a plurilateral "Trade in Services Agreement" (TiSA) has gathered support. Doha Round commitments, unilateral and bilateral liberalization, industry support, and the ideas for a TiSA could be harmonized with a SETA or Environmental Goods Agreement, synergizing trade in sustainable energy goods and the complementary services.

In order to realize such "win-win" outcomes for socioeconomic development and the environment and to spur job creation in the field of sustainable energy, both domestic and international supportive frameworks must be conceived.

A SETA could provide for such a framework for the massive scale up of both goods and services related to sustainable energy, and focusing initially on services related to the construction and ICT sectors could provide a good starting point for such an agreement.

6.9 Conclusion: Ways Forward

This chapter has made a case for facilitating trade in sustainable energy technologies, as it can help to reduce greenhouse emissions, provide access to sustainable energy for all, enhance energy security and independence, and achieve different development goals. The chapter has shown that a range of instruments, called Sustainable Energy Trade Initiatives, can be useful for facilitating trade in SETs and for avoiding trade disputes. As Sustainable Energy Trade Agreement, which could be integrated into the WTO framework, would be the ultimate goal of this endeavor. The fact that a growing group of countries has started negotiating an Environmental Goods Agreement, which will include many sustainable energy technologies, is very encouraging in that respect.

The success of striking a deal in APEC recently on lowering trade barriers for environmental goods in APEC, the mandate by US President Barack Obama to upgrade this to a global deal, and increased awareness of the business community of the benefits of a SETA have created enormous momentum.

Some key legal issues for a SETA, such as its legal form, dispute procedures and substantive rules require further attention and deliberation. Substantive issues that could be prominent in a SETA are local content requirements, technology dissemination, government procurement and subsidies. Particular attention should be paid to trade in sustainable energy services, as this is an often-overlooked sector, despite its significance for job creation and capacity building.

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Chapter 7
The Future of Sustainability Reporting as a Regulatory Mechanism

David Hess

Abstract Sustainability reporting is now a mainstream activity among large, global corporations. The majority of the largest corporations in the United States now produce sustainability reports, and several European countries either mandate corporations to produce some form of sustainability reports or are in serious consideration of such legislation. Although leading standards such as the Global Reporting Initiative have made significant advancements in setting out the types of information that corporations should publicly disclose, mandatory sustainability reports will not work as an effective policy mechanism unless they are placed in a system that can effectively utilize the information and cause corporations to change their policies and practices. Using insights from New Governance regulation and meta-regulation, this paper examines the current sustainability reporting industry, and explores potential breakdown points (e.g., conflicts of interest in information intermediaries) and possible future developments.

7.1 Introduction

In discussions on how to encourage corporations to move towards practices and strategies consistent with sustainable economic development, a common mechanism mentioned is transparency. Often, this is the default approach, as it allows greater flexibility for both corporations and the government. Transparency initiatives work to encourage (or pressure) corporations that can do more to do more (as opposed to command-and-control regulation where all corporations are held to the same standard). In addition, the performance objectives are allowed to evolve

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over time, which works towards continuous improvement and each corporation advancing towards those goals at a pace that is reasonable for that corporation. Transparency initiatives also work to reduce the government's regulatory burden, as various stakeholder groups are empowered—through access to information—to hold corporations accountable for their performance and to push for improvement.

In the area of sustainable development, the primary transparency mechanism is the use of sustainability reports. These are disclosures by corporations on how they manage the various issues related to sustainable economic development and on metrics designed to show their actual performance over time. Over 80 % of the Global Fortune 250 now publish sustainability reports. Although reports meeting the requirements of leading standards on sustainability reports are voluntary, an increasing number of countries are enacting legislation to require disclosure on some of the metrics recommended by the most well-known reporting standards. For example, France, Denmark, and Sweden, all require some form of disclosure on social or environmental issues (United Nations Environment Programme, KPMG, Global Reporting, & Unit for Corporate Governance in Africa, 2010).

Despite the growing use of sustainability reports and the increased attention they are receiving from policy makers, there is significant debate on whether or not they actually push corporations to meaningfully improve their performance on sustainability dimensions. At the time of this writing, Ioannou and Serafeim (2011) have published the only large-scale study to show that mandatory sustainability reporting causes corporations to adopt more environmentally and socially responsible practices and to improve on relevant performance measures. Of course, Ioannou and Serafeim's results will not satisfy the critics that argue that sustainability reports can never push corporations to radically rethink their operations (and even existence) and move towards sustainability in any meaningful way (Mitchell, Curtis, & Davidson, 2012). Instead, sustainability reports can only operate within a "weak sustainability" vision, which "implies that capitalism may be restructured to cope with environmental problems without requiring a total transformation of the political–economic system." (Ihlen & Roper, 2014; see also, Luke, 2013).

Even if we accept that sustainability reports can only work to push corporations towards "weak sustainability," there is still significant doubt that current practices can make significant progress towards that goal. These critics argue that sustainability reports are not of use to those stakeholders that seek to hold corporations accountable for their actions. Instead, the incentives are for corporations to produce a "high volume and low quality of information," which stakeholders find difficult to assess in terms of veracity and completeness (Siebecker, 2009, p. 128). These concerns are consistent with the view by some that corporate social responsibility in general has been taken over by corporations as a managerial tool to manage risks and further marketing goals, as opposed to being responsive to stakeholder demands and incorporating sustainable development into company values and operations (Bondy, Moon, & Matten, 2012). Mitchell et al. (2012, p. 1062) state that "reporting can and has been used to capture and control sustainability discourses and to avoid or defer organizational change (maintain status quo)." In short, corporations dissemble by selectively and strategically disclosing information, directing stakeholder

dialogues towards reputation and risk management goals rather than true stakeholder engagement, and decoupling the reporting process from the corporation's strategic and operating decisions (Hess, 2008).

To attempt to correct the problem of dissembling, many have suggested making social reports mandatory. Although there has long been a debate over whether reports should be mandatory or not (Hess, 2007), the recent trend is towards mandatory reporting in some form. For example, a recent report states:

> Instead of presenting mandatory and voluntary sustainability reporting as exclusive options, they are in fact highly complementary. Assuming a complementary relationship between mandatory and voluntary approaches, the challenge for governments then becomes to determine the appropriate minimum level of mandatory requirements. (United Nations Environment Programme et al., 2010: 8).

Overall, many questions remain over whether sustainability reports can meaningfully push corporations towards making their operations more sustainable, and therefore be an effective regulatory mechanism. In short, we are in one of three possible situations. One, current practices are on a trajectory where sustainability reports support "small wins" (Mitchell et al., 2012, p. 1063) in the short term, but will eventually lead to meaningful change over time. Two, "small wins" are the best that sustainability reports can deliver in changing corporate behavior. Three, corporations' current practices work only work to enable corporations to manage risk and forestall any real progress towards change.

To understand the ability of sustainability reports to push corporations towards sustainable development in the long-term (scenario one above)—whether in the current primarily voluntary approach or with the increasing mandatory requirements—it is important to understand the system surrounding sustainability reports. The simple story of transparency initiatives is that disclosure by corporations will empower stakeholders to push for changes in corporate practices. However, there are a significant number of steps that need to occur before that simple story can be enacted, and a breakdown at any step can prevent meaningful change.

In their review of government regulation of individual and business behavior through transparency programs, Fung, Graham, and Weil (2007) refer to an action cycle. This cycle involves the disclosure of information, the processing of that information by users which causes the users to develop perceptions of the discloser, the integration of that information into the users' decision-making process and resulting change in behavior, the disclosers' change in behavior in response to the users' actions, and then a new round of disclosure showing the disclosers' new behaviors. As applied to sustainability reports, this action cycle helps us see where breakdowns can occur. For example, the transition in the cycle from corporate disclosure to the processing of that information by users requires a suitable standard for sustainability reports for corporations to follow, complete disclosure against the indicators included in the standard, the assurance of the accuracy of the information contained in the reports, and the presentation of the information in a format that allows end users to understand and process the information. In our current system, this cycle is likely broken, as most of the evidence suggests that we have selective and misleading disclosures that are not adequately audited.

This chapter considers the sustainability reporting action cycle by examining the actors involved in making the cycle work. Through this examination, we can develop a better understanding of what policy interventions are needed to make sustainability reporting an effective regulatory mechanism. This chapter proceeds by discussing how sustainability reporting can function as a regulatory mechanism, and then discusses the actors involved, including the corporations that produce reports, the developers of reporting standards, consulting and assurance providers, intermediary groups that process the information in reports for end users, and the end users.

7.2 Sustainability Reporting as a Regulatory Mechanism

When considering the role of sustainability reports, and transparency initiatives in general, it is important to consider how they are supposed to function to achieve their goals. Regulatory initiatives based on transparency fit well into New Governance regulatory approaches (or meta-regulation, and other similar categorizations) (Hess, 2007). Under these approaches, corporations are given a significant amount of freedom to develop their own ways of reaching a particular goal. Thus, this regulatory approach may be viewed as government regulation of self-regulation (Parker, 2007).

The approach is most useful in situations, such as corporate sustainability, where our understanding of the exact regulatory goal is unclear and the means the regulated entity should use to achieve those goals are also unclear (Hess, 2006). Due to these means and ends challenges, New Governance approaches focus on problem-solving, decentralization, and broad participation from a variety of stakeholders (with different perspectives and areas of expertise). With the government playing a role of "orchestrator" (as opposed to standard setter), this approach encourages the corporation to experiment on solutions, and stakeholders to both provide guidance and hold the corporation accountable. Through this experimentation and engagement, the actors attempt to find the best solution for the issue or organization at hand (taking into account the relevant unique aspects of the situation), find best practices that can be used for other organizations, and seek continual improvement (Hess, 2007).

From this brief description, it is easy to see how transparency through non-financial reporting can be classified as a form of New Governance regulation. In prior work (Hess, 2008), I have described three basic pillars that are necessary for transparency to function effectively as a New Governance method. They are: disclosure, dialogue, and development. Disclosure is the publication of information on how the corporation manages issues related to sustainability and its performance against various indicators. As with any disclosure-based regulation, the information allows stakeholders to hold the corporation accountable. In addition, the information can be used for other purposes, such as the spreading of best practices and examination of the need for other policy interventions.

The second pillar is dialogue. Dialogue is the engagement with the corporation's stakeholders, both during the creation of the report (to determine which issues are

of most importance to the stakeholders and ensure the corporation understands evolving societal expectations) and over the information in the report. This includes dialogue with NGOs, consumer groups, investors, and others. The third pillar is development, which refers to the moral development of the corporation as seen through changes in management policies and systems, strategy, operations, and corporate culture. Development ensures that corporations are thinking "critically, creatively, and continually" (Orts, 1995, p. 750) about sustainability, and then implementing changes designed to improve their performance.

With these regulatory goals in-mind, we now take a look at the sustainability reporting system and its action cycle, as it currently exists. To do this, we look at each major actor separately, including: the corporations that produce sustainability reports, the organizations that are making the standards for what a sustainability report should include, the consulting and accounting organizations that provide services to corporations producing reports, the intermediaries that process the disclosed information and make it available for others to use, and finally the users, which includes those that directly consume sustainability reports and those that utilize the information through intermediaries.

7.3 The Sustainability Reporting System

7.3.1 Corporations

The action cycle of sustainability reporting begins with the disclosure of information by corporations on how they manage issues of sustainability and their performance against certain metrics. Thus, the initial question is how to get corporations to provide disclosure? In most countries, sustainability reporting is primarily voluntary, which raises the question of why corporations produce such reports knowing that stakeholders may use the information to criticize the corporation's performance and demand changes.

Many researchers studying why corporations issue sustainability reports find that legitimacy theory provides the explanation. These studies show that corporations are motivated by attempts to maintain legitimacy with its stakeholders. Corporations viewed by important stakeholders as acting against societal norms on sustainability will lose legitimacy, so they must find ways to demonstrate (or create the perception) that they are socially responsible. Thus, research has found that corporations that operate in industries with significant sustainability concerns and corporations that have recently undergone a negative incident are all more likely to disclose information on their performance on sustainability matters (for reviews, see Comyns, Figge, Hahn, & Barkemeyer, 2013; Hahn & Kühnen, 2013). This is also consistent with studies showing that corporations adopt certain corporate social responsibility (CSR) practices as a form of insurance against future negative events (Minor & Morgan, 2011; Peloza, 2006).

Not surprisingly, these disclosures are then focused almost exclusively on positive information. What is surprising, however, is that these symbolic actions (as opposed to true commitments to transparency) seem to work. That is, the other actors in the sustainability reporting organizational field seem to reward disclosures of any quality. For example, Bansal and Clelland (2004), show that firms with low levels of legitimacy with respect to the environment (as seen through negative press coverage) are able to reduce their unsystematic stock market risk by simply using communications that do no more than just express the company's environmental commitment.

Supporting this acceptance of symbolic actions are those organizations in the CSR field that rank corporations on the quantity of their disclosures (i.e., the number of indicators reported against), and not the actual performance of the company. Thus, simply reporting on more indicators—regardless of whether those disclosures are selective and actually work towards creating a misleading impression of the company's efforts and performance—can allow a corporation to be seen by stakeholders as working towards sustainable development. The end result is that readers of sustainability reports will learn that corporations have already "arrived" at the end of goal of sustainable development, instead of being on a difficult journey towards that goal, which requires serious consideration of major changes in operations and strategies (Ihlen & Roper, 2014).

To correct these problems, many commentators suggest some form of mandatory sustainability reporting against a standardized form. Thus, as pointed out above, in recent years, the debates have shifted away from whether or not to mandate disclosure, and towards how to mandate disclosure. For example, in 2009, the GRI, the leading standard setter for sustainability reports since 1999 (described below), moved away from a focus on voluntary reports and issued a declaration urging countries to consider adopting mandatory legislation in this area. Until sustainability reporting legislation become more thorough and widespread, the GRI organization, interested investors, and others, have to rely on the "business case" to convince corporations to produce reports. The weight of the existing evidence, however, shows that the business case simply leads to selective and strategic disclosure designed to protect the corporation's legitimacy. Even if the trends toward mandatory reporting continue, many questions remain on how to create a system around sustainability reports that creates a successful action cycle.

7.3.2 Standard Setters

Sustainability reporting standards provide guidance to corporations on how to structure a sustainability report and what indicators to report against in the report. These standards seek to ensure that reports produce a complete and accurate picture of a corporation's efforts and performance, and that they meet various stakeholders' information needs, including allowing the stakeholders to compare the performance of various corporations.

Today, the Global Reporting Initiative (GRI) is the most well-known and widely used standard for the development of sustainability reports. New competition continues to emerge, however. The two major competitors that have appeared in the last few years are the Sustainability Accounting Standards Board (SASB) and the International Integrated Reporting Council (IIRC). The main difference between these organizations is that the GRI was established to make corporations accountable to all of its stakeholders. The SASB and the IIRC, by contrast, have investors as their primary audience.

The GRI is a multi-stakeholder organization and seeks to use a governance model that ensures it represents the views of all sectors of society, and not just business and investors. Its reporting guidelines have evolved over time and in 2013 it released its fourth version of reporting guidelines, the G4. The G4 focuses on corporations disclosing "material" information, which it defines as information "that reflect the organization's significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders" (Global Reporting Initiative, 2013a, p. 7) To determine what is relevant and material for that corporation, the G4 requires corporations to consider impacts outside its legal organizational boundaries, such as its supply chain. These impacts may be "direct or indirect for some topics or as caused by, contributed to, or linked to the organization for others" (Global Reporting Initiative, 2013b, p. 34). In addition, a corporation is required to engage with its stakeholders—and disclose how it identified its stakeholders and engaged with them—to determine what issues are of importance to them and should be discussed in the report.

By contrast, the IIRC and SASB focus on investors. The IIRC focuses on "integrated reporting," which is combining financial reports and sustainability reports into one report, as opposed to having a standalone sustainability report. The idea of an integrated report is that by combining financial and non-financial reports, it will encourage corporations to embed sustainability throughout the organization (and assist in that process) (Eccles & Krzus, 2010). The IIRC's version of integrated reporting is focused on helping investors identify those social and environmental issues that are material from an investor's perspective.[1] The IIRC's approach is also focused on creating the "business case" for the consideration of environmental, social, and governance (ESG) issues, which it believes will cause managers within the corporation to take these issues more seriously and then seek to improve performance (IIRC, 2013b).

[1] The IRRC states:

At the heart of [Integrated Reporting] is the growing realization that a wide range of factors determine the value of an organization—some of these are financial or tangible in nature and are easy to account for in financial statements (e.g. property, cash), while many are not (e.g. people, natural resources, intellectual capital, market and regulatory context, competition, energy security). [Integrated Reporting] reflects the broad and longer-term consequences of the decisions organizations make, based on a wide range of factors, in order to create value over time.

IIRC (2013a)

The SASB has the most limited goal, as it is focused only on improving disclosures in a corporation's annual report on matters material to its investors. The SASB describes itself as "engaged in the creation and dissemination of sustainability accounting standards for use by publicly-listed corporations in disclosing material sustainability issues for the benefit of investors and the public" (SASB, 2013a). The SASB states that the SASB and IIRC are both focused on investors as their audience, while the GRI is focused on all stakeholders (SASB, 2013b). By using a process of materiality mapping, the SASB begins with 40 different sustainability issues and examines their relevance for each industry. Their goal is to produce stand-alone standards for each industry (over 80 in all) that show what issues are "material" for investors (under United States law) and therefore should be disclosed in annual reports. Once the SASB has completed this process for each industry—releasing industry standards separately as they are completed—they plan to work to obtain formal approval of their standards by the SEC. To work towards this goal, SASB seeks to only use indictors that it believes will be auditable (SASB, 2013c). By contrast, the GRI seeks to provide greater accountability to all stakeholders through a larger number of required disclosures.

These three standards provide three different models for corporations to follow in producing sustainability reports, as well as three different models for mandatory requirements from governments. This raises the question of whether the developers of these standards are competitors for users. As corporations feel greater pressure to produce sustainability reports—due to concerns of mandatory reporting requirements and greater pressure from investors and NGOs—there is the potential for a "race to the bottom" where corporations seek to adopt the most lenient standard and the standards setters compete to provide that standard. For instance, for the IIRC to be successful, it has to convince corporations of the "business case" for reporting. The SASB must convince corporations and investors of its value, both for voluntary adoption and, ultimately, to seek SEC approval. The end result may be that the standard that requires the least amount of information and gives the corporation the greatest ability to selectively and strategically disclose will dominate. There is some evidence that this is happening. Based on her observations and interviews with GRI officials, Sarfaty (2013) argues that the "GRI is no longer aimed at empowering its original audience [communities, consumers, NGOs, and social investors] to hold corporations accountable," (Sarfaty, 2013, p. 607) but instead its primary audience is corporations in order to increase the use of their reporting standards. Levy and colleagues state it more starkly: the GRI standard setters took "efforts to shape GRI as complementary to corporate and financial market needs. The strategic risk, of course, is that GRI would be co-opted and assimilated within these structures rather than transforming them. This does appear to be the emerging outcome." (Levy, Brown, & de Jong, 2010, p. 111).

On the other hand, sustainability reporting could evolve in the opposite direction. That is, the SASB approach—which has the most limited goal—may actually lead to greater acceptance and adoption of broader sustainability reporting in the long term. Under this perspective, if corporations adopt (either voluntarily or through

SEC mandate) the SASB guidelines for annual report disclosures, then the legitimacy of non-financial reporting in general increases. Over time, this could lead to expanded disclosures, as investors gain greater familiarity with using this type of information and develop expectations of corporations providing it. This assumes that SASB standards do not become so watered-down through a SEC review process as to provide only very limited information to markets, which could then significantly impede progress due to the lack of usefulness of the information provided.

As the SASB develops, it also suggests a different route for transparency advocates. That is, pushes for mandatory disclosure from those representing non-shareholder stakeholders could focus on matters that fall outside the investor materiality standard. One example may be the Dodd-Frank Act's adoption of requirements that match the Extractive Industries Transparency Initiative (EITI). These could be issue-by-issue pushes for mandatory disclosure requirements, as opposed to reports that seek to push corporations to conduct a holistic review of their operations. Standards such as the GRI could then evolve to focus on how corporations can pull all of this information from various legal requirements (those focused on investor needs and those focused on targeted issues) together into one report, with the additional goal of requiring corporations to understand how these issues fit together in operational and strategic decisions.

7.3.3 Consulting and Assurance Services

Regardless of which standard a corporation chooses (or is required) to use, it will likely need assistance from consultants to create the report and from auditors to provide verification services for those reports. Not surprisingly, one commentator argues that these consultants and assurance providers "derive more economic benefit from the GRI than any other stakeholder" (Sarfaty, 2013, p. 609; see also Levy et al., 2010). These organizations provide a wide variety of services to corporations related to non-financial disclosure, such as:

- how to engage stakeholders
- the provision of data management services
- how to structure the report and communicate the company's vision and performance more generally
- assurance services for part, or all, of the sustainability report
- how to use the sustainability report within a broader CSR strategy for risk management

As any one organization may provide all of these services as well as others to corporations, there are many potential conflicts of interest. For example, there is a concern that in an effort to please their clients (corporations that are purchasing a wide variety of services from accounting firms and not just services related to sustainability reporting), the accounting firms may overlook disclosures that are

technically accurate but do not represent a complete picture of the corporation's performance on that issue (O'Dwyer & Owen, 2007). Some commentators have also expressed the concern that these accounting and consulting firms unduly dominate the setting of standards, such as the GRI, and their conflicts of interest challenge the legitimacy of the resulting standards (Sarfaty, 2013). Apart from conflicts of interest, some have challenged the expertise of many of these organizations to provide verification services (i.e., accounting expertise versus sustainability expertise).

7.3.4 Intermediaries

The end users of the information contained in sustainability reports are not necessarily readers of sustainability reports. Instead, they may use information from sustainability reports that is provided to them through information intermediaries. These intermediaries provide many services to end users, such as transforming the information into a format that is easier and more understandable for the end user, providing the end user with only the information they care most about, comparing the performance of multiple corporations, measuring a company's progress over time, supplementing the information from sustainability reports with other sources of information (both public and proprietary), monitoring the credibility of the information contained in sustainability reports, and other services (Hess, 2007).

For example, Thomson Reuters' Asset4 database claims to provide ESG data on over 4,000 global companies, with over 120 analysts collecting information from sustainability reports and other information sources (Thomson Reuters, 2013). The intended audience for the data is institutional investors, investment managers, and analysts. MSCI ESG Research provides a similar service, with different products meeting different needs. For example, if an investor wants to minimize the risk of investing in a company that will suffer from reputational risk, MSCI's Impact Monitor database will rank companies based on their performance against soft law mechanisms such as the UN Global Compact (MSCI, 2013a). MSCI also provides products designed for investors that want to negatively screen companies that do not meet the investors' ethical standards, as well as products for investors that use positive screening (investing in those companies with the highest ESG performance in their industry) (MSCI, 2013b).

Sustainability investment indexes may also be viewed as intermediaries. Indexes such as the FTSE4Good and the Dow Jones Sustainability Indices, combine information from sustainability reports with other data sources (including proprietary data collected through surveys), and then decide whether to include a company in a particular index. Investors may then choose to use one of these indices as a way of practicing sustainable investing (FTSE, 2013; RobecoSAM, 2013).

Another group of intermediaries would be those that publish rankings of corporations on certain dimensions. The Newsweek Green Rankings is one well-known example. These organizations that rank companies creates a market for one group of

intermediaries to sell data to another group of intermediaries. For example, Trucost collects information on environmental data, which is then sold to companies, investors, and researchers, including Newsweek (Trucost, 2012).

In most of these examples of intermediaries, the intermediary is funded by the organization (typically investors) that purchase the products. This has the advantage of avoiding the conflicts of interest that existed in the subprime mortgage market where the credit rating agencies were funded by the organizations whose products they were rating. However, because the investor community is the largest intermediary group, it also means that the push for corporations to produce more and better data, or to use particular standards, is biased by the needs of that community. The interests of other stakeholders, such as employees, consumers, and special interest groups, are not represented, unless filtered through investors. Thus, there is the question of whether this bias is problematic—resulting in sustainability reports that only provide information that is "material" for investors—or if investors are able to work with NGOs and others to ensure that corporations are producing sufficient information to be held accountable to all stakeholders. For example, the anti-corruption NGO Transparency International has worked with investor groups to push for greater disclosure on corporation's anti-bribery efforts, and they have taken considerable effort to ensure that those disclosures work towards a transparency initiative that meets the goals of New Governance regulation (Hess, 2012).

7.3.5 End Users

Who uses sustainability reports? That appears to be an open question. Sustainability reports are becoming institutionalized as a feature of a socially responsible corporation, but the value of the reports to users is not well understood. There are claims that NGOs—initially envisioned as the user of reports in their civil regulator role—do not use the reports because they do not contain sufficiently useful information (either to fully understand a corporation's actions, policies, and performance, or to compare performance across companies). Intermediaries, such as those described above, use the information to some degree, but they supplement it with additional information (including their own proprietary surveys of corporations). Thus, it is unclear how much they value the information in the reports.

Of course, other stakeholders may use the information in ways that do not follow the action cycle described above of end users creating incentives for disclosers to improve their behavior. For example, industry competitors may use the information to improve their own performance (i.e., learning). As another example, the management team of the discloser may use the process of creating the report to improve operations and to build a company culture that values sustainability (Hess, 1999; Hess, 2001). Despite the growth of sustainability reporting, there is little research on how (and if) different stakeholder groups use the reports.

7.4 Discussion

The assumption behind transparency initiatives is that disclosure will lead to corporations engaging in some form of a dialogue with stakeholders (ranging from constructively suggesting better practices to shaming practices), which will then cause the corporations to make internal changes (development), so they can produce more favorable disclosures in future reporting cycles. Considering all the actors involved and their incentives, there are questions on the accuracy of that model and what can be done to improve the system as we move forward. For example, do we need one sustainability reporting standard to attempt to achieve all of these goals? Or, is there room for multiple, complementary standards? In other words, are the IIRC, SASB and GRI competitors, or complements? And, if complements, how does that impact how these standards should evolve and the role of government?

Under the current model of voluntary GRI reports, most research seems to support the conclusion that sustainability reports have their greatest focus on risk management and protecting the company's reputation. This is consistent with broader concerns about using CSR strategically:

> By increasingly focusing on strategic forms of CSR activity, MNCs are moving away from a societal understanding of CSR that focuses on redressing the impacts of their operations through stakeholder concerns, back to any activity that supports traditional business imperatives. (Bondy et al., 2012).

The standard response to these concerns is the need for mandatory reporting using standardized indicators and independent verification of the information (and often, required engagement with stakeholders). However, as seen above, the assessment of the potential effectiveness of such a system requires consideration of the current actors in the organizational field surrounding sustainability reports and this raises many questions.

What type of standards should be mandated? Should the standards be more similar to the SASB which is focused on the disclosure pillar, and primarily the needs of investors? Or, the GRI standards which emphasize dialogue (stakeholder engagement) and development? Are these current standards compliments or competitors? Should each push for their standard to be mandatory, or find some other approach?

Answering these questions requires additional, in-depth research on the actors described in this chapter. As just one example, additional research is needed on the influence of different departments and officers within the firm on the sustainability reporting process. For example, consider if the legal department, the communications department, and the sustainability officer each separately developed a sustainability report for the same corporation, and how different each of those three reports would be. This thought experiment may influence how we want the government to become involved. For example, it may be best for the GRI if the government made a SASB-type standard mandatory (which would involve the legal department, but the standards are written to be auditable and may not be significantly affected by significant legal department oversight), and found other ways to incentivize corporations to create sustainability officer positions (and/or sustainability committees on

boards of directors). Sustainability officers are more likely committed to the principles of disclosure, dialogue, and development, and may seek to produce GRI-type reports to supplement any mandatory reporting for investors. Thus, the GRI may be better served by getting its standards adopted in practice through this indirect route rather than through government mandated adoption of the GRI standards.

7.5 Conclusion

This chapter encourages academics, policy makers, and others, to consider more fully the system required for sustainability reporting to have a meaningful, positive impact on corporate behavior. In short, we need to remember two things. First, transparency is not an end in itself. Any transparency-based policy initiative designed to improve the performance of corporations with respect to issues of sustainability must be based on a clear understanding of how the required disclosures will lead to improved performance. The New Governance approach to regulation, and the pillars of disclosure, dialogue, and development, provide one way to think through those issues. Second, when considering mandated disclosure of sustainability reports, we must be sure to consider how those reports will be used in practice. There needs to be a clear understanding of how we expect the action cycle to work, where the potential breakdown points of the cycle are located due to various actors' incentives, and how those breakdowns can be avoided or corrected.

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Chapter 8
Greenwashing 2.0: Identifying a New Paradigm Through B-to-B Threat Matrices

Eric L. Lane

Abstract The traditional paradigm for investigating, studying, and combating greenwashing has been to focus on claims by companies engaged in marketing consumer products or services to individual consumers (i.e., business-to-consumer, or B-to-C, communications) and the effects of those claims on consumers. But the current clean tech revolution has greatly increased commerce in green technologies, much of which is business-to-business ("B-to-B"). This shift calls for a new paradigm in understanding greenwashing. Rather than limiting the focus to deceptive marketing of consumer products to individual consumers, we must contemplate a wider variety of cases that include representations made to green commercial consumers (B-to-B communications) and legal actions brought by and on behalf of commercial consumers. This chapter builds on the author's previous arguments for this broader view of greenwashing by providing threat matrices that can be used as identification tools. They can help eliminate a current blind spot and provide the broader vantage point necessary to identify and understand new instances of greenwashing.

8.1 Introduction

The rise of the environmental movement led, perhaps inevitably, to the emergence of environmental marketing. Since at least as early as the 1970s, advertisers and marketers have sought to capitalize on consumer concerns about the environment by touting environmentally friendly aspects of products, services, and business practices. This is no surprise, as the group of consumers whose purchasing decisions are

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influenced by the environmental impact of the products and services they buy has grown to become a large constituency (Tolliver-Nigro, 2009).

Traditionally, environmental marketing claims took one of two forms, general corporate spin or specific product attributes. For many years nearly all instances of "greenwashing" involved business-to-consumer ("B-to-C") scenarios. But times have changed. Concern about climate change has settled into the public consciousness, and the environmental movement has produced an important offshoot, sometimes called the "clean tech revolution" (Pernick & Wilder, 2007). Over the past decade, substantial and sustained investment in the development and deployment of green technologies—particularly renewable energy generation technologies such as wind turbines, solar panels, and biofuels—has significantly grown the green economy The clean tech boom has given rise to a much more complex stream of green commercial marketing activity. Much of the green economy today involves business-to-business ("B-to-B") deals, with clean tech companies marketing their green branded equipment, products, and services to developers, utilities, and retailers. As clean tech has become big business, green marketing has expanded beyond advertising of products to individual consumers into B-to-B communications regarding clean tech products and services to green commercial consumers.

The inclusion of B-to-B communications requires a new paradigm for thinking about greenwashing if one is to fully characterize the phenomenon. It should define greenwashing expansively to include any false or misleading claim regarding the environmental benefit of a product, service, or business practice. Its analysis should not be limited to cases brought by or on behalf of individual consumers, but should also contemplate legal actions by and on behalf of green commercial consumers.

This chapter describes a methodology for an expanded characterization of greenwashing. The new cases that have accompanied the clean tech boom and arisen under the new paradigm are breach of contract or warranty suits involving energy generation equipment and projects, trademark infringement actions regarding branded green technology equipment, and fraud cases in connection with renewable energy credits. These cases can be categorized by their effects and potential effects on commercial consumers. More particularly, a new paradigm taxonomy organizes these suits by the degree of greenwashing, i.e., actual or potential, and the level of economic loss to the aggrieved party due to the actions of the accused greenwasher. Changing the greenwashing paradigm in this way will reflect the commercial realities of the clean tech revolution, and will provide the broader vantage point necessary to identify instances of greenwashing and understand its prevalence and effects.

8.2 The Traditional Concept of Greenwashing

The traditional greenwashing paradigm—the focus on false or misleading environmental marketing of consumer products to individual consumers—was dominant throughout the 1970s, 1980s and 1990s. The vast majority of commerce in purportedly

environmentally friendly products during that time was in connection with products made for and marketed to individual consumers. There simply were very few green products or technologies being produced or consumed in significant volumes outside of the consumer context (Pernick & Wilder, 2007). The vast majority of published legal decisions from this period involved accusations of false advertising brought by and on behalf of individual consumers. Significant early environmental marketing cases involved advertising claims by oil companies and automakers relating to fuel products and automobile performance (e.g., *Cartt v. Superior Court*, 1975). Toward the end of the 1970s, the FTC warned consumers about potentially misleading advertisements in connection with a variety of devices and features intended to improve fuel efficiency (Mills, 1979). Even when climate change began to appear as an occasional impetus for false advertising challenges, the disputed ads were B-to-C communications targeting individual consumers and therefore fell within the traditional greenwashing paradigm.

The 1990s was a time of rapid and substantial growth in environmental marketing, but also a time of rapid response by government watchdogs on behalf of individual consumers. The states and the federal government became increasingly active in the area. Most notably, in response to pressure from state attorneys general and industry groups, in 1991 the FTC conducted hearings to create federal guidelines for environmental advertising and marketing claims (Gibson, 2009). The FTC subsequently initiated an aggressive campaign against deceptive environmental advertising in the 1990s.

Perhaps the largest single class of traditional paradigm greenwashing cases to date, the FTC's environmental enforcement actions in the 1990s are a collection of challenges to environmental marketing of consumer products on behalf of individual green consumers (FTC, 2014). These actions included multiple cases targeting ads for plastic grocery and trash bags, many challenges to ads for aerosol cleaning and beauty products, and a host of actions involving packaging, tableware and food service products. Other products the FTC targeted for false or misleading environmental marketing claims during this period include disposable diapers, laundry detergent products, and gasoline, motor oil, and automobile care products. Private actions against greenwashing also continued in the 1990s. Though there were occasional instances of litigation between competing businesses (*Fuller Bros. Inc. v. Int'l Mktg. Inc.*, 1994), more common were individual consumer lawsuits and consumer class actions involving products such as home boilers and "degradable" garbage bags (*Delgozzo v. Kenny*, 1993). This enforcement environment continued into the next century and became global as government agencies in the United Kingdom and Australia commenced enforcement actions (Adver. Standards Auth, 2008; Austl. Competition & Consumer Comm'n, 2008).

There were also many private actions in the 2000s involving alleged deceptive advertising directed at individual consumers. These cases continued even after the advent of the clean tech revolution and are likely to continue in the future. The products at issue included cars, cleaning supplies, and plastic bottles.

8.2.1 *Emergence of Clean-Tech Commerce and the Need for a More Comprehensive Definition*

In the early days of greenwashing there was no clean tech industry, per se (Pernick & Wilder, 2007). In the 1970s, renewable energy technologies were at a very early stage of development and remained the province of small players. Neither wind energy nor solar power, the two significant new renewable energy industries, gained any traction, let alone achieved sustained growth or viability. Each saw a flurry of activity in the 1970s followed by a steep drop off in the 1980s and 1990s Wind Energy Foundation).

But false starts gave rise to the strong, sustainable, and very diverse clean tech industry that we know today. Since the adoption of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol, 1997), which set binding obligations on industrialized country signatories to reduce greenhouse gas emissions, the number of new worldwide green technology patent application filings rose dramatically (United Nations Env't Programme et al., 2010). A major investment in research and development and substantial growth in various clean tech markets followed (Pernick, 2012).

Now that we are in the midst of the first sustained clean tech boom, there is greatly increased commerce in green technologies, often involving larger scale goods, particularly clean tech industrial and power generation products such as wind turbines, solar panels, biofuels, and cogeneration (combined heat and power) equipment (Makower & Pernick, 2001). The steep and steady growth in these clean tech market sectors means that many green technologies are now being bought, sold, installed, and operated in large volumes. In addition to the industrial goods on the market, there are numerous related clean tech industry services such as technical consulting, compliance, and research. To move these green technologies from factory to field often requires complex transactions and multiple skilled players along the way.

Therefore, in clean tech today, much of the commerce is business-to-business. The field comprises a complex commercial ecosystem, with commercial "consumers" situated at various points along the development, supply, and operations chain. And the large investments required for research and development and commercialization of clean tech products and projects mean that each player in the chain has substantial capital at stake (Makower, 2010).

It is time for a new greenwashing paradigm that captures the communications in B-to-B transactions. By properly categorizing greenwashing cases, public policy and legislative initiatives can be better aligned to support clean technology goals. There are advantages to any country that acts. Conversely, a failure to specifically address B-to-B greenwashing may increase technology costs and delay adoption.

8.3 A Typology for Identifying Greenwashing 2.0

It is becoming clear that some clean tech commercial players are increasingly tempted to make false, misleading, deceptive, or inflated claims about the environmental benefits of their products and projects. Moreover, the B-to-B marketing of

green commercial products and services in the clean tech industry renders each commercial "consumer" in the supply chain vulnerable to greenwashing. This is the context that has given rise to the new paradigm: Greenwashing 2.0.

The new greenwashing paradigm looks beyond those environmental marketing claims about consumer products directed at individuals, which formed the basis of nearly all greenwashing cases in the 1970s, 1980s, and 1990s, to encompass representations made in connection with the sale of industrial green technology equipment and services to commercial consumers. The definition of the term "greenwashing" need not change to accommodate the new paradigm. In fact, as discussed below, the claims and activities at issue in the new paradigm cases tend to fall squarely within the conventional definition of the term—false or misleading claims about the purported environmental benefits of a product, service, or business practice. By expanding the context in which we recognize environmental marketing claims as potential greenwashing, the new paradigm enables a more complete understanding of the scope and impact of the greenwashing problem by taking into account the new commercial reality of the clean tech revolution.

8.3.1 Utilizing "Harm Matrices" as a Guide

To better understand which, if any, of the categories of new paradigm greenwashing cases are harmful enough to warrant possible remedial action through additional laws or regulations, cases can be organized according to the economic and environmental harms they are likely to cause. Greenwashing 1.0 is also included as a benchmark.

Breach of contract and warranty cases often involve allegations of greenwashing. The products or services at issue are significant renewable energy projects such as wind farms as well as expensive power generation equipment, including utility-scale wind turbines and cogeneration units. As such, the loss resulting from defective or underperforming goods and inaccurate resource estimates is likely to be high. At the same time, the scale and expected power output of the projects and equipment at issue make it likely that any resulting environmental harm will also be high.

If the new paradigm fraud cases that have emerged so far are typical, this category will likely result in substantial economic loss, at least for the victims of the schemes, and potentially on an industry-wide scale as in, for example, the biofuels industry. The fraudulent schemes at issue are instances of actual greenwashing as fake renewable fuel credits are sold as genuine. This hurts the market for biofuels, causing significant economic harm.

The breach of contract or warranty actions and the fraud cases involve instances of actual greenwashing and are most likely to result in high economic loss and a high level of environmental harm. Accordingly, these are the new paradigm categories that warrant further scrutiny and possible remedial measures to mitigate against this harm. This is depicted in Fig. 8.1, which distinguishes between standard economic harm cases and true greenwashing cases in the context of products and services.

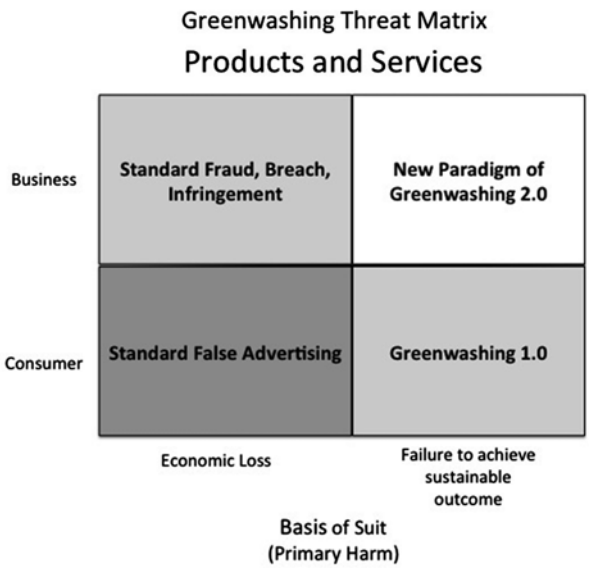

Fig. 8.1 Greenwashing Threat Matrix: Products

A second category of situations that constitute greenwashing under the new paradigm is trademark infringement where the marks at issue are owned by manufacturers of clean tech products such as wind turbines, solar panels, and materials for solar cell manufacturing. New paradigm eco-mark infringement actions, as a category, are not necessarily cases of actual greenwashing. That is, not every green technology product accused of trademark infringement or found to infringe will be of inferior quality or provide lesser environmental benefit than the branded good. However, should the infringing product be inferior such that it provides no environmental benefit, or less than the genuine article, the level of environmental harm would likely be high. In either case, the economic loss for both the brand owner (and possibly the customer) of most complex, expensive equipment is likely to be high, irrespective of environmental benefit.

Figure 8.2 considers eco-marks specifically and plots the level of environmental harm against actual or potential greenwashing, recognizing the pure economic harm is still relevant.

As a benchmark, these basic criteria serve as preliminary estimations of the relative levels of harm caused by each category of case.

8.3.2 The Greenwashing 2.0 Typology in Practice

As noted above, under the new paradigm, greenwashing cases can include breach of contract claims in which a manufacturer or another commercial player in the clean tech industry misrepresents the resources or capacity of a project site or inflates the

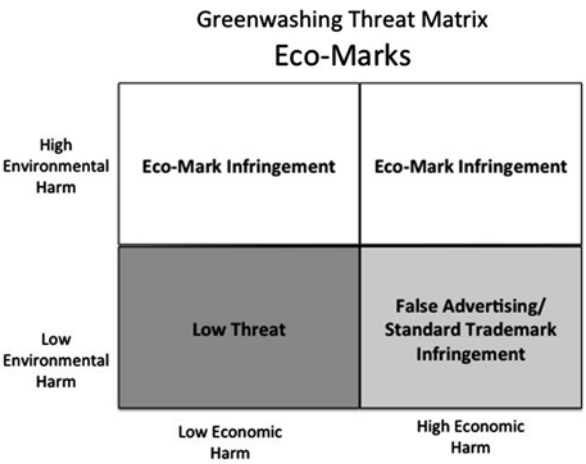

Fig. 8.2 Services–Greenwashing Threat Matrix: Eco-Marks

efficiency or production capability of power generation equipment. Or they can include damage to eco-marks. An analysis of the harm is slightly different in the two categories of cases.

8.4 B-to-B Breach of Contract or Warranty (Product or Service) Greenwashing

Green commercial consumers that purchase faulty equipment or otherwise enter into business deals with the company that made the allegedly deceptive statements are the primary plaintiffs in product or service greenwashing. In these instances, the alleged misrepresentations fit squarely within the traditional definition of greenwashing, and the potential damage to the commercial "consumer" and the environment is significant. This risk arises because the statements at issue relate to wind farm projects, and products such as wind turbines and cogeneration units, whose sole purpose is to harness renewable energy or efficiently generate power.

8.4.1 D.G. Cogen Partners v. Hess Microgen

A recent dispute over false or misleading representations regarding power generation equipment centered on cogeneration, or combined heat and power ("CHP") units. In 2008, DG Cogen Partners, LLC ("Cogen"), a California-based installer and operator of energy efficient power systems, sued Hess Microgen ("Hess"), for damages Cogen allegedly suffered due to a fleet of faulty cogeneration units, including the Hess Microgen 200 Packaged Cogeneration System ("Microgen 200") (*DG Cogen Partners v. Hess Microgen*, 2008).

In 2004, Cogen purchased a fleet of Hess CHP units, including Microgen 200 units, from a third party, becoming the assignee of the third party's purchase agreement with Hess. In its complaint, Cogen alleged that, prior to and at the time of its purchase, Hess failed to disclose flaws in the CHP units and misrepresented the capabilities of the products through statements, technical documents, and advertising. In particular, Cogen alleged that Hess represented that the units contained "rich burn" engines that generated high thermal output when the engines were actually "lean burn," which provide lower output and require more steps to meet regulatory compliance. The complaint further alleged that the units subsequently failed completely or did not generate electricity at the rated capacity.

Misrepresenting lower thermal output "lean burn" engines as high output "rich burn" models would constitute greenwashing if those products were marketed to individual consumers, and should also be considered greenwashing when, as here, the units are marketed to commercial consumers. The efficiency and thermal output of the cogeneration units are the very aspects that make them green because these features provide power in a cleaner fashion than conventional units. Here, Cogen, a company focused on environmentally friendly power production, relied on Hess's assurances that the units would operate to specification and its representations about thermal output levels in its decision to take over the contract for the equipment. Cogen suffered significant economic losses as a result.

Moreover, the energy wasted by misleading operators like Cogen into purchasing and operating less efficient CHP units is potentially quite large and damaging to the environment. By some estimates, if the energy lost in the form of waste heat were harnessed it could provide one-fifth of the energy needs of the United States (Margonelli, 2008). Energy efficiency technology, particularly recycling waste heat by cogeneration, is too important to be compromised by false claims and faulty equipment, and it is this environmental context that compels recognition of Cogen's lawsuit as a greenwashing case.

8.4.2 DeWind v. Glenmore Wind Farm

Another example of B-to-B greenwashing in the wind industry involves DeWind Company ("DeWind"), a vertically integrated global wind company based in Germany and southern California (*DeWind v. Genmore Wind Farm*, 2012). In 2009, DeWind entered into an agreement with Glenmore Wind Farm, turbine maker Urban Power, and project developer Prelude, through which it agreed to pay $250,000 for the exclusive right to purchase or sell the other parties' interests in a 14 MW wind farm project. DeWind did not find any buyers for the project and, due to its economic loss, sued Glenmore, Urban, and Prelude for breach of contract. According to the complaint, DeWind's inability to close a sale of the project was due to misrepresentations the defendants made about the project's wind resource estimate and the defendants' failure to complete additional development work required by the agreement.

Specifically, DeWind alleged that prior to the agreement defendants stated that the net capacity factor of the project site was 31.8 % while the wind resource estimate report defendants provided after execution of the agreement put the number at 25.8 %. This difference in net capacity factor made the project uneconomical, DeWind alleged, and proved to be a "decisive cause" of DeWind's inability to sell the project.

With a green commercial consumer in DeWind, as opposed to an individual, accusing other commercial players of making false or misleading representations in connection with the sale of a clean tech project, this case can be viewed as greenwashing only under the new paradigm proposed here. The representations at issue, if false or deceptive, would comport with the common definition of greenwashing because they are statements about the environmental benefits of a product or service, specifically false wind resource estimates. More particularly, an inflated net capacity factor for a wind farm project site misrepresents the clean energy production capability of installed wind turbines at the site (Vaughan, 2006). Thus, such false numbers go directly to the green benefits of a project developed for the sole purpose of generating renewable energy.

More importantly, this type of greenwashing in connection with major renewable energy facilities could have a significant adverse impact on efforts to curb climate change. As the facts of the DeWind case suggest, false claims about the capacity of a project site can kill a wind farm project by preventing its sale to an operator that would keep the wind farm online generating renewable energy. Alternatively, such misrepresentations could lead to misinformed investment in a particular project, which might otherwise have been directed to a more viable renewable energy generation facility. If true, not only would the allegations of inflating net capacity factor for a wind farm be greenwashing, but DeWind's anti-greenwashing legal action would be at least equally, if not more, important than many of the cases involving false or misleading claims brought by or on behalf of individual consumers.

8.5 New Paradigm Eco-Mark Infringement Cases

Centering on "eco-marks"—trademarks and service marks used in connection with green goods and environmental services—these actions are brought by green brand owners on behalf of their green commercial consumers. Traditionally, such instances of eco-mark infringement involving industrial clean tech equipment would not be on the radar of commentators or policymakers, let alone be considered potential greenwashing cases by those actually focused on the issue. However, trading on an established clean tech company's reputation for quality green technology products is potential greenwashing as it conveys false or misleading information about the genuineness of the infringing chapters by cloaking them in the established goodwill of the eco-mark owner. Moreover, to the extent the infringing products or services at issue in these cases are inferior in overall quality or energy output, the infringers' acts constitute actual greenwashing on a highly damaging scale.

8.5.1 Suntech Fights Eco-Mark Outlaws

In August 2008, Suntech Power Holdings ("Suntech") sued its competitor Shenzhen Xintian Solar Technology Co. and its subsidiary Sun Tech Solar (collectively "Sun Tech Solar") in federal court in San Diego, California for alleged infringement of its SUNTECH trademarks (*Suntech Power Holdings Co. v. Shenzhen Xintian Solar Tech. Co.*, 2008). According to the complaint, Sun Tech Solar's infringing activity included use of the confusingly similar trademarks SUN TECH and SUN TECH SOLAR in connection with the sale of solar modules similar to Suntech's products. Suntech obtained legal relief when the Court granted Suntech's motion for a preliminary injunction, ordering Sun Tech Solar to cease all use of the SUN TECH and SUN TECH SOLAR marks, as well as any other confusingly similar marks, in connection with solar modules in the U.S. Suntech also succeeded in winning injunctions against a solar module counterfeiter in Europe (Suntech, 2009).

Sun Tech's actions in misrepresenting that its solar modules are the reputed genuine articles constitute greenwashing under the new paradigm. Sun Tech was free-riding on Suntech's established reputation as a major manufacturer of high quality green products. The eco-mark infringement, a calculated passing off of Sun Tech's solar modules as those of a well-known clean tech company, falsely cloaks the counterfeit chapters in the established goodwill of the SUNTECH mark. As such, the infringement conveys false or misleading information about the genuineness of those solar modules. Though the damage may not be immediate and tangible, such free riding is, in effect, a false marketing message about green products, and therefore constitutes greenwashing.

In enforcing its solar product trademarks, Suntech is acting on behalf of its green commercial consumers to protect them against the tangible harm that counterfeit chapters could inflict. According to Suntech's press release about the injunctions in Europe, the company is "determined to proactively protect our customers' interests and the integrity of the Suntech brand (Suntech, 2009)." Eco-mark infringement actions can therefore be considered anti-greenwashing enforcement actions with the brand owner acting to protect of its commercial consumers from the greenwashing activity of eco-mark infringers. As is typical in counterfeiting situations, the biggest concern from a consumer protection standpoint is the potential quality gap between the products of the known brand and the imitations (OECD, 1998). Dr. Zhengrong Shi, Suntech's Chairman and CEO, emphasized the high quality and performance of his company's products:

> Due to our stringent quality control programs, Suntech solar products offer industry leading power output guarantees and frequently exceed project performance targets. They have also been utilized in many of the world's largest and highest profile PV solar projects (Suntech, 2009).

The most salient concerns with counterfeit solar modules are that they will produce less renewable energy than the genuine chapters or will not last as long. With solar modules, devices whose sole function is to harness and generate renewable energy, any such performance discrepancy would mean less of the intended green benefit. In other words, infringers holding out counterfeit solar modules of inferior

quality are engaged in greenwashing by, in effect, making false or misleading representations about the environmental benefits of these knockoff renewable energy products. Thus, Suntech's eco-mark enforcement actions in Germany and the United States are important anti-greenwashing measures that should prevent such problems by precluding sales of the knockoff modules going forward.

8.5.2 Nordic Battles an Ill Wind, and Other Potential Eco-Mark Greenwashing

Another eco-mark case involved alleged free riding on a green brand owner's reputation for quality renewable energy equipment. In August of 2009, Nordic Windpower ("Nordic"), a wind turbine manufacturer based in Berkeley, California, sued Nordic Turbines, Inc. ("NTI"), a competing turbine manufacturing venture, alleging that NTI's use of the term "Nordic" to market and sell wind turbines and raise capital for the manufacture of wind turbines infringed Nordic's trademark registration (*Nordic Windpower USA, Inc. v. Nordic Turbines, Inc.*, 2009).

As in the Suntech dispute, the products are the same and the eco-marks at issue are effectively identical. Therefore, the likelihood of consumer confusion would likely be high, and commercial consumers such as wind farm developers and operators could end up with products materially different and inferior quality than the ones they intended to buy. Should purchasers of renewable energy equipment and the accompanying power receive inferior wind turbines or reduced power output, these purchasers might enjoy far less green benefit from their investment. Because the sole function of a wind turbine is to generate electricity from a clean, renewable resource, the activity at issue in this case goes directly to the environmental benefit of the allegedly infringing product. If problems arise with the quality or energy output of the allegedly infringing turbines sold by Nordic, this should be considered a greenwashing case under the new paradigm.

Other eco-mark infringement cases in recent years have involved chemicals used in manufacture photovoltaic devices (*Voltaix, LLC v. NanoVoltaix, Inc.*, 2009), LEDs, and environmental compliance software (*Enviance, Inc. v. Enviance Servs.* LLC, 2012), an emerging technology used to measure, manage, and report greenhouse gas ("GHG") emissions as well as other environmental health and safety data with the goal of reducing environmental impact.

8.6 New Paradigm Fraud or False Advertising Cases

A third species of new paradigm cases involves allegations of fraud in connection with renewable energy and fuel credits. The rise of government-issued credits to stimulate the production and use of renewable energy and reduce greenhouse gas emissions has created secondary markets in which the credits are traded and sold

(Shaffer, 2012). Parties required to maintain certain levels of renewable energy or fuel production can purchase valid credits to demonstrate compliance, and these new markets can be fertile ground for fraudulent representations.

Promulgated under the Clean Air Act, the EPA Renewable Fuel Standard ("RFS") Program requires "obligated parties" to sell gasoline containing a percentage of renewable fuel (*Cargill, Inc. v. International Exchange Services*, 2013). To ensure that sufficient volumes of renewable fuel are produced and imported, companies in the gasoline business are required to meet annual Renewable Volume Obligations (*Cargill, Inc. v. International Exchange Services*, 2012). One way these parties meet their obligations is by acquiring enough Renewable Identification Numbers ("RINs") to demonstrate compliance. A RIN is a numeric code generated by a renewable fuel producer or importer that represents a gallon of renewable fuel.

Cargill, a large multinational agribusiness, produces and sells biofuels and participates in energy markets. In September of 2012, Cargill sued International Exchange Services ("IES"), a commodities trader, for allegedly selling it invalid RINs. According to the complaint, the disputed RINs were purportedly originally issued by a producer called Double Diamond Biofuels ("Double Diamond"), but the RINs were invalid and not actually generated by Double Diamond. Although the two claims were dismissed, including the claim under the Clean Air Act, Cargill may go forward with its breach of contract claim.

It is unclear from the Cargill complaint who originally perpetrated the fraud, and indeed the named defendant may not even know, but the fraudulent activity represents a grave instance of greenwashing. The creation of invalid RINs undermines the policy of the RFS Program—to ensure a certain level of renewable fuel in gasoline—by damaging the market for valid RINs and ultimately reducing the actual volume of biofuels in circulation (Shaffer, 2012). The RIN scam has hurt the biofuels industry by making obligated parties more wary of purchasing the credits from biodiesel producers. The fraud and resulting damage are recognizable under the new paradigm when we view putative RIN purchasers like Cargill as green commercial consumers falling victim to false representations about the validity of renewable energy-based financial products.

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