Environmental and Social Sustainability for Business Advantage Collection
Chris Laszlo and Robert Sroufe, *Editors*

The Role of Legal Compliance in Sustainable Supply Chains, Operations, and Marketing

John D. Wood

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Abstract

This book on sustainable business is for advanced business education students, practicing managers and executives, and environmental lawyers. Sustainability is a global megatrend with ramifications across all functional areas of business. This book addresses an underdeveloped topic in the field of sustainable business, specifically, the use of corporate resources dedicated to legal compliance. Supply chain, operations, and marketing professionals must know what the applicable legal frameworks are in order to comply with the law. In order to promote sustainable business, these same professionals must go beyond mere compliance with these laws. This book assists readers in both respects by (1) offering concise discussions of the primary legal frameworks governing the social, economic, and environmental dimensions of supply chain management, operations management, and marketing; and (2) making the business case for going beyond mere compliance with legal requirements. Each chapter ends with Practical Applications in the form of instructions for practitioners to apply what they have learned in the previous chapter. Written by an expert in environmental law and public policy, this book argues that companies that go beyond mere compliance with social, economic, and environmental safeguards inherent in legal regimes will capture greater benefits and incur fewer risks from their supply chain, operations, and marketing activities. A sustainable company will go beyond mere compliance with the law.

Keywords

environmental law, marketing, operations, legal compliance, social license to operate, supply chain management, sustainable business

Contents

Disclaimer

This chapter discusses general principles of law for the benefit of the public through education only, and does not undertake to give individual legal advice. Nothing in this chapter should be interpreted as creating an attorney–client relationship with the author(s). The discussion of legal frameworks in this chapter is not intended to persuade readers to adopt general solutions to general problems, but rather to inform readers about a variety of laws that apply to various aspects of sustainable business. Readers should not rely on this chapter as a substitute for legal counsel. For specific advice about legal issues, see a licensed attorney.

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PART I

The Role of Legal Compliance in Sustainable Business

CHAPTER 1

Introduction

What Are We Doing Here?

Sustainability is a global megatrend with ramifications across all functional areas of business. On the demand side, sustainable business is driven in part by investor and consumer demand for socially responsible, environmentally conscientious, and economically valuable products and services. On the supply side, drivers of sustainable business include cost savings from efficient resource use, natural resource scarcity from overconsumption, and increased risk of extreme weather events from a changing climate. Effectively, sustainable business practices reduce costs and risks while increasing long-term value creation and strategic positioning.

Although discussions of sustainability between heads of state began in earnest with the 1987 publication of the United Nations Development Programme report *Our Common Future*, it has taken over two decades for the policies of sustainability to take hold in the private sector. It would be a mistake to think that sustainability is just a fad that will go out of vogue as soon as economic conditions get tough and businesses are forced to focus on the financial bottom line. That is because sustainable business is the new bottom line.

According to research from *MIT Sloan Review* based on surveys of over 3,000 business executives and managers representing a wide range of company sizes from all over the world, corporate spending on sustainability actually grew after the global economic recession of 2007, with nearly 60 percent of companies increasing their investment in sustainability initiatives as of February 2011.[1] Further, leaders from across industry sectors, from electronics to mining, increasingly agree with the statement that "acting on sustainability is essential to remaining competitive."[2] It now becomes necessary to define "sustainability."

Let's start with two key definitions. *Sustainable economic development* "meets the needs of the present without compromising the ability of future generations to meet their own needs."[3] *Sustainable business* means "balancing social, economic, and environmental considerations in business decision making; stewarding the natural resource base upon which the business depends; giving back to the communities in which business is done; and promoting long-term value creation for the company's investors."[4]

Even if readers do not share the policy ambitions of sustainable development, it pays to be informed of the legal landscape of business. *Legally astute* business managers are in a position to understand and proactively address emerging legal issues, which can mean avoided risks and liabilities for the company, resulting in increased firm value.[5] For instance, a legally astute executive would be familiar with the potential for legal liability from taking over ownership of a legacy facility that might contain hazardous waste on the premises. Ultimately, it pays to know how law comes to bear on business affairs, and as it turns out, the legal landscape is shifting toward sustainability as a baseline for minimum standards of care in corporate conduct.

Before going further, let's define the purpose and scope of this endeavor. This book addresses an underdeveloped topic in the field of sustainable business, specifically, the use of corporate legal resources. This is not a book about the legal documents used by business, such as performance contracts, financial instruments, or intellectual property. Rather, this book is about how companies can sustainably manage the resources dedicated to legal compliance.

Now let's define our central key concept: *sustainable legal compliance* means avoiding social and environmental harms that the law would otherwise permit by going beyond mere compliance. We will look at the role of legal compliance in promoting sustainability within core functional areas of business: supply chain management, operations management, and marketing.

Let's Get the Controversy Out in the Open

Obviously, the subject of this book is replete with hot-button issues, such as the proper role of government in regulating economic activity, and the

extent of corporate social and environmental responsibility. The temptation is to give in to comfortable assumptions and political views, which tend to cut strongly to the political left or right: on the left, big corporate is bad, and on the right, big government is bad. These superficial generalizations stymie the author's efforts to carry on a sustained, lucid, and practical discussion of these issues. Personally, I take the militant moderate path, because there is no use in an out-of-balance discussion. Both extreme ends of the spectrum—no regulation versus overregulation of economic activity—are wrong for a lot of reasons.

As a matter of fact, corporate entities are big in terms of influence over public policy decisions, and so too are government entities big in terms of influence over economic activity. Instead of seeking to reduce the influence of existing corporate or government power structures (however valuable that may be), this book seeks to speak to those in government and industry with power over policies. Far from promoting some political ideology, the humble goal of this book is to stimulate the discussion on corporate sustainability by shining light on the neglected topics of the role of law in achieving sustainable supply chains, operations, and marketing.

Putting aside the controversy, from a market perspective, sustainable business can be approached from a tactical and strategic position. Tactically, sustainable business practices facilitate compliance; help avoid regulatory penalties, fines, legal fees, and project delays; minimize supply chain disruption through optimized operations; and enhance emergency preparedness and natural disaster recovery. Strategically, sustainable business practices enhance reputation capital and protect the company brand; shore up social license to operate; and enhance shareholder value.

Sustainable Business in Context

The laws of nature, civil government, and economics are driving corporations toward the new normal of sustainable performance.

Part of the driving force behind sustainable business is the looming problem of *resource scarcity*. We simply must become better stewards of the natural resources upon which supply chains for raw materials depend. According to a 2011 survey from Ernst & Young and GreenBiz, over

three quarters of corporate respondents believe that core business objectives will be impacted by natural resource shortage in the next 3 to 5 years.[6] The painful pinch of running up against nature's barriers to growth is nearly upon us. The risk of overexploited natural resources on business performance is so material that dependency on forest products, rare earth metals, minerals, and water resources is becoming a de facto financial reporting obligation.

In addition to nature's barriers to unsustainable growth, government entities at all levels of political organization—municipal, state, regional, national, and international—have started taking initiatives to solve the interconnected social, economic, and environmental challenges of sustainable development. However, in a certain respect, the one-way ratchet proliferation of laws, rules, regulations, guidelines, and standards can be an impediment to efficient economic activity.

Laws are general statements of public policy made by the legislative branch that describe the goals and powers of government to address the health, safety, and welfare of the country. *Rules and regulations* are specific statements of policy made by the executive branch to implement laws enacted by Congress. *Guidelines and standards* are detailed explanations of substantive and procedural regulatory requirements provided by the executive branch to facilitate private sector compliance with regulations.

For example, the Clean Air Act is a law enacted by Congress to address environmental and public health issues from air pollution, whereas the National Ambient Air Quality Standards are regulations designed to implement the goals of the Clean Air Act, and New Source Review Policy and Guidance documents are meant to improve compliance with the regulations authorized by the law. (We discuss the Clean Air Act at greater length in Chapter 6.)

As the legal environment of business becomes increasingly complex with new laws, regulations, and guidelines, the more painful compliance becomes for borderline compliant firms. If the private sector can take the lead on sustainability issues, the pressure for governmental responses to social and environmental problems may be reduced. An operating environment with success defined by market competition rather than government mandates may be good for business. But free market dynamics that create major externalities, such as air pollution, call for a governmental response.

Sustainable legal compliance in the private sector would incrementally reduce the need for top-down laws, regulations, and guidelines through a process of industry driven self-governance. What would leadership in the area of legal compliance look like? We answer this question at the end of each chapter in this book with practical applications to go beyond mere compliance.

The Good, the Bad, and the Ugly News

Many companies have seized the opportunity to become a leader in terms of sustainable performance metrics. Unilever, Timberland, Seventh Generation, and many others have demonstrated that businesses can make a lot of money doing right by society and doing right by the environment. These companies are the "good news." Hopefully, there will be more good news in years to come. The "bad news" is drawn from companies that, through innocent mistake or criminal negligence, have failed to manage risks to the environment and public welfare, or even positively created risks that materialized in disastrous fashion. Catastrophic oil spills and financial scandals come to mind as exemplars of unsustainable corporate performance. Unfortunately, it seems there will always be bad news.

The ugly news is that the transition from the unsustainable status quo to a sustainable economy will involve many small steps forward and backward as markets respond to an unprecedented, tectonic shift in what it means to responsibly run a business. For instance, trying to do the right thing can lead to adverse unintended consequences; putting the planet before profits might punish some companies for failing to strike the appropriate balance. Alternatively, some companies will continue to be rewarded despite poor environmental performance. Puberty is ugly too, but still a necessary transitional phase toward maturity. Ugly news should be treated as mere growing pains to a maturing economy, and should not be viewed as a refutation of the general sustainability imperative.

Where Do We Go From Here?

The U.S. government, like many civil governments around the world, regulates economic activity that adversely impacts the environment,

public health, and worker safety. Often these regulations take the form of rules laid out in complex statutory schemes, and promulgated through technical rulemaking procedures. These rules are not very accessible to a busy professional without advanced legal training. This book provides a guided tour of the most salient aspects of federal environmental law that should be accessible to "outsiders" of the regulatory arena.

This book explains the relevant operational requirements of the laws affecting sustainability in the functional business areas of supply chain management, marketing, and operations management. These sections err on the side of brevity and relevance rather than exhaustiveness or comprehensiveness, because a detailed treatment of all relevant law and policy issues would fill volumes. In this way, business managers and executives can attain a better understanding of the basic contours of laws affecting the sustainability of corporate throughput, from the labor used by suppliers, through the methods of production, and to the methods for selling final goods.

Key Terms

sustainable economic development
sustainable business
legally astute
sustainable legal compliance
resource scarcity
laws
rules and regulations
guidelines and standards

Practical Applications

1. Make a note of if and when you hear about sustainability at your company.
   a. Who is leading the discussion about sustainability? For example, does it come from leadership, shareholders, employees, regulators, or whom?
   b. What is the driving motive behind these discussions? For example, is it risk reduction, profit increase, reputation protection, or what?

2. Identify the primary ways in which sustainability affects your company.
   a. Distinguish between social, economic, and environmental aspects of sustainability.
   b. Distinguish between how these trends affect your industry in general versus your company in particular.
3. Determine whether your company outperforms its industry average in terms of adverse environmental impacts and resource efficiency.
   a. Leverage any superiority of your company's performance over industry averages for the purpose of competitive differentiation.
   b. Where your company consumes and pollutes more than average, develop a strategy to improve these figures.
4. Understand how the business case for sustainability applies to your company.
   a. Distinguish between opportunities for cost- and risk-avoidance, on one hand, and value creation, on the other.
   b. Integrate the business case for sustainability into your division's strategic mission.

CHAPTER 2

Legal Compliance Is Merely a Step Toward Sustainable Business

Compliance as Bare Minimum Care

Complying with the law is necessary, but not sufficient, to run a sustainable enterprise. The law does not say what is desirable behavior per se, but merely what is tolerable behavior. In this way, law establishes the normative boundaries of acceptable conduct. The terms for operating a business in civil society are thus: violate the law, and face some form of punishment; comply with the law, and avoid punitive measures from government. Clearly, compliance with the law is not so much a recipe for success as it is a means of avoiding failure. Violating the law is usually not, and never should be, a managerial goal. But neither should *mere compliance* with the law's requirements be a managerial goal. Sustainable businesses go beyond mere compliance.

Improving sustainable performance by leapfrogging the minimally acceptable standards of corporate conduct can provide a buffer against the ever-encroaching tendrils of government regulations. If a company is already beyond mere compliance, incremental changes in regulatory standards will not require costly modifications to business activities or management protocols. While marginally compliant firms might struggle or go bankrupt when environmental standards become more stringent, sustainable companies may benefit from competitive advantages such as streamlined permitting, lower compliance costs, and improved government and public relations. Cooperative oversight between the government and private sector (as opposed to confrontations between the regulator and the regulated company) is a primary driver of regulatory

outcomes. Agencies enjoy significant discretion in how they enforce regulations, so cooperation between company attorneys with front-line regulators is important for ongoing government relations management.

The U.S. Environmental Protection Agency (EPA) is putting forth increasingly strict standards for greenhouse gas emissions on power plants and vehicles. State governments such as the California Legislature have passed laws affecting a vast array of firms importing goods into the U.S. markets. All of these legal developments create uncertainty for companies determined to *merely comply* with laws. For firms proactively addressing sustainability challenges, these potential legal developments may provide competitive advantages.

Relationship Between Compliance and Risk Management

Risk is exposure to the chance or likelihood of a disaster or hazard; *risk management* is the process of deciding which risks are worth addressing and the extent to which these risks should be avoided.[1]

Having in place a comprehensive legal compliance plan dealing with the social, economic, and environmental impacts of business reduces the risk of poor management affecting sustainable performance. With adverse impacts ranging from negative press, employee injuries, regulatory penalties, and an eroded social license to operate, compliance failures can be costly. As such, corporate compliance has a strong relationship with enterprise risk management.

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) is a joint initiative between the American Accounting Association, American Institute of CPAs, Financial Executives International, The Association of Accountants and Financial Professionals in Business, and the Institute of Internal Auditors. The COSO joint initiative provides thought leadership on enterprise risk management and fraud control, among other things. COSO articulates its well-established standards of Internal Control and Enterprise Risk Management in a way that connects legal compliance with risk management:

> An entity's strategy and objectives and the way they are implemented are based on preferences, value judgments, and management styles.

> Management's integrity and commitment to ethical values influence these preferences and judgments, which are translated into standards of behavior. Because an entity's good reputation is so valuable, the standards of behavior must go beyond mere compliance with the law. Managers of well-run enterprises increasingly have accepted the view that ethics pays and ethical behavior is good business.[2]

So, there are business benefits that flow from a good track record of legal compliance: the institutional culture is improved by the high standards of conduct that are expected from management and employees. Risks are minimized, corporate reputation is protected, and there are no nasty surprises. On the other side of the coin, failing to uphold the strictures of laws and regulations invites business risk. According to the Security Exchange Commission's (SEC) Director of the Office of Compliance Inspections and Examinations, "There are plenty of enforcement cases that tell the story of highly talented and successful individuals who were punished because they violated their ethical and compliance responsibilities. A corporate culture that reinforces ethical behavior is a key component of effectively managing risk across the enterprise."[3]

When a company decides to take on a risk, this decision must be made explicitly, after thorough consideration of costs and benefits by corporate leaders, and must be consistent with the overall risk appetite and existing risk profile of the company. When individual employees surreptitiously defy legal requirements, they add risks to the company that are not factored into the explicit process of enterprise risk management, which throws off the careful calibration of corporate risks, hedges, assets, and liabilities. Instilling an institutional culture of going above and beyond mere compliance limits the opportunities for individual employees to cut corners and take on risks that end up reflecting negatively on their employer.

The number of regulatory violations a company experiences can also impact the price it pays for insurance. Because insurance is a primary mechanism by which corporations share risk, insurance carriers will demand higher premiums for companies with bad compliance track records. Of course, some risks occur because of actions that took place before insurance coverage was obtained; some risks are not even insurable; and disputing insurance coverage claims can be expensive, so insurance might not be available

to mitigate all risks. Presumably, insurance carriers expect companies to go beyond mere compliance with regulations as to avoid the risk of accidental violations. That risk is higher for companies that are borderline compliant. "Shooting for mere compliance is the equivalent of shooting for a C-. When we set our standards at barely getting by, we put ourselves at risk."[4]

Why Companies Go Beyond Mere Compliance

Recall that sustainable economic development involves intergenerational stewardship of natural resources, and that sustainable business involves a balancing of social, economic, and environmental considerations in decision making. For a sustainable business, the duty of care for corporate leaders is expansive, including ecosystems and future generations. This is contrasted with the traditional view on the social responsibility of business, articulated in Milton Friedman's influential essay, "The Social Responsibility of Business is to Increase its Profits."[5] Under the traditional view, beyond increasing profits, the moral and social responsibilities of corporate conduct ended with legal compliance. That is, if a company meets the strictures set by law, it has exhausted its responsibility to the general public and owes nothing further outside of its profit maximization paradigm.

The prevalence of the traditional view of corporate responsibility is demonstrated by historic trends in corporate legal compliance: companies complied with law only for instrumental reasons, meaning that obedience to the law was not because the law's dictates were perceived as proper, but because violating the law carried the weight of penalty that compliance would avoid.[6] According to the traditional model for the social responsibility of corporations, legal compliance satisfied any social or moral duties that corporations might have toward the general public, under the assumption that "regulations are taken to be a measure of societal expectations[.]"[7] According to the traditional view, then, we could expect a corporation to go beyond mere legal compliance if and only if some short-term self-interest, such as increased profits, would be promoted by these efforts.[8]

The challenges of sustainable development have changed this calculation. Social expectations have shifted such that today, just because a

company has a government permit to operate, does not mean affected communities will not protest certain kinds of corporate conduct. Community groups and nonprofit public interest groups apply pressure to companies wherever adverse social and environmental problems arise, regardless of whether government regulations apply. This informal policing of corporate conduct by social expectations makes up the *social license to operate*. "In some instances, the conditions demanded by 'social licensers' may be tougher than those imposed by regulation, resulting in 'beyond compliance' corporate environmental measures even in circumstances where these are unlikely to be profitable."[9]

Although maintaining social license to operate is not necessarily synonymous with running a sustainable enterprise, it is an important element to the equation because it means corporate conduct meets the expectations of the communities impacted by corporate activities. Earning and keeping social license to operate avoids risks of *negative ethical consumerism*, such as boycott, and promotes brand loyalty and corporate ethos.

The extent to which compliance with social license requirements (e.g., superior environmental controls) can actually go beyond the requirements for legal license (e.g., minimal conditions on a government permit) is limited by the company's third license to operate: economic license (e.g., "the requirements of market actors—suppliers, customers, consumers, shareholders, institutional investors, etc.").[10] In other words, a company might go beyond mere compliance with its regulatory permit (legal license) in order to appease protesters from the community affected by a factory (social license) by installing pollution controls; however, these pollution controls cannot cost so much that the company frustrates its customers with increased prices (economic license).

Still, a company's social license to operate must play an important role in sustainability initiatives. Shoring up or losing the social license can "punish or reward firms in terms of reputation capital," which means expenditures into sustainability initiatives is justified not by profitability analysis, but rather, by less quantifiable reputational concerns over corporate citizenship.[11] The goal of maintaining corporate *reputation capital* can encourage companies to attain complete legal compliance, or even to go beyond mere compliance in order to "provide a 'margin of safety' against violations."[12] Overcompliance might mean emitting less pollution than a

government permit would otherwise allow, so that in case of mechanical breakdown or accidental spill, there is still no major injury to surrounding communities or ecosystems.

Many permits contain provisions related to accidental discharges. Because government regulators have discretion with how they use enforcement powers, companies with a good compliance track record and a history of going beyond mere compliance will be in a better position to negotiate or even avoid penalties in case of accidental violations.

The Importance of Maintaining Social License

Going beyond mere compliance with laws can provide a reserve of positive reputation capital that preserves a company's social license to operate even when accidents do occur.[13] If a company has a good reputation, members of communities affected by corporate risks may still give the company the benefit of the doubt as mitigation efforts are employed. Conversely, without adequate reputation capital, even sustainability efforts with good intentions can generate controversy among the affected community. Consider the example below of BP's well-intentioned effort to mitigate the impacts of the Gulf of Mexico oil spill in April 2010.

The public response to the cleanup efforts of BP's Gulf of Mexico oil spill in April 2010 demonstrates how a lack of reputation capital can punish companies that are trying to do the right thing.[14] The oil slicks from 210 million gallons of crude that spewed from the blown-out wellhead drifted across surface waters along the Gulf coast. In order to prevent the further catastrophe that would result if these slicks reached these pristine beaches and fragile marine ecosystems, BP procured about one-third of the world's supply of Corexit, a chemical dispersant, and began spraying it over the affected waters. Corexit emulsifies oil into tiny beads, which are supposed to sink harmlessly into the deep. However, scientists and environmental activists pointed out that Corexit is not only harmful to marine life on its own, but when combined with crude, it can evaporate into polycyclic aromatic hydrocarbons, a dangerous compound known to cause cancer and developmental disorders.

In April 2012, a study by Louisiana State University Department of Oceanography and Coastal Sciences found millions of deformed shrimp

with no eyes and crabs without claws, possibly linked to the oil and dispersant exposure. A nonprofit group EcoRigs, which seeks to promote artificial reefs and alternative energy production from abandoned offshore oil and gas platforms, sent divers to sample water and marine life at locations in the affected area after the blowout. Many of these volunteers later began experiencing symptoms believed to be caused by Corexit exposure, including bleeding from orifices and cognitive damage. The company had already suffered the reputational losses from the *Deepwater Horizon* explosion and resulting spill, so this cleanup effort, as well-intentioned as it may have been, was considered by scientists and the environmental community as just one more adverse impact on top of another.

To be sure, the federal government had approved the disaster recovery plan, including the use of dispersants. The EPA approved the application of "unprecedented volumes of dispersant" as part of the environmental triage, despite that "much is unknown about underwater use of dispersants."[15] This government approval did not offer much by way of reputation. The *Deepwater Horizon* and resulting fallout resulted in a 50 percent loss in BP's share price, representing the company's loss of reputation capital and resulting in an increased stringency of the terms of its social license to operate. The loss of grace was evident in the public's response to its cleanup efforts.

"When regulatory compliance becomes a byproduct of our work, people notice. Especially our detractors. It seems that when people think we care about what they care about, they begin to see us as human—capable of making mistakes in spite of our mission and best efforts."[16] In other words, a major reason why companies go beyond mere compliance is to keep the good graces of the communities affected by their activities.

It goes without saying that not all companies comply with the laws designed to protect the environment and public health. We discuss the motives and forms of noncompliance in the next section.

Violations of Environmental Law

Because of the operational and reporting requirements of environmental regulations, businesses with a relatively substantial environmental footprint may experience significantly higher overhead for compliance than

less-polluting firms. To limit these compliance costs, companies may avoid compliance altogether by relocating outside of the legal jurisdiction. This tactic for avoiding compliance is discussed below in the section on regulatory arbitrage. When this is not possible, some managers may be tempted to violate the law through intentional noncompliance: open refusal and surreptitious violations are of this sort. The most benign form of noncompliance is an accidental violation.

Accidental violations occur when, for example, a substance that poses a threat to the environment or public health is released into the environment in such a way that is neither planned nor expected by the emitting company. The industry term for these accidental violations is "nonroutine incidents." Accidental releases are usually accompanied by immediate implementation of an emergency response plan. Accidents, by their nature, are not always predictable or controllable. That is why emergency preparedness and response plans are paramount for companies that handle substances that pose a threat to the environment or public health, and are required by many regulatory programs.[17] Having a spill-response plan in place enables rapid containment and cleanup to minimize the amount of damage resulting from the accident. While accidents may not lead to a fine (because some are innocent mistakes that fall within accidental spill provisions of the relevant government permit), failure to have in place an emergency response plan may result in a penalty for the company. Planning for accidental violations just makes good business sense. British Petroleum would have avoided hundreds of millions of gallons of crude oil spilled into the Gulf of Mexico, and avoided billions of dollars of fines under the Oil Pollution Act, had they implemented a successful emergency response plan immediately after the deep-sea oil drilling blow-out, instead of taking months to address the problem, and having to develop new technology to do so. Accidental violations are by definition not intentional, but they can certainly be costly.

Open refusal to comply with environmental rules is based on an explicit cost-benefit analysis, where the cost of compliance is greater than the cost of paying the fines and penalties for noncompliance. In this case, business managers would rather pay government fines than modify operations to bring their businesses into compliance. Open refusal to comply with specific legal requirements is done in a transparent manner, whereby

directors, managers, employees, and investors are aware of the situation and decide to avoid compliance based on the best financial interests of the firm. Generally speaking, the governing agency is apprised of the noncompliance and levies the fine accordingly. Often, the requirement at issue does not involve harmful violations such as toxic dumping, but rather something more technical (like timing, notice, paperwork, or other technical requirement). Open refusal is never appropriate when the violations are of substantive legal provisions (how much to pollute), rather than merely procedural requirements (when paperwork is due). At least with a procedural violation no one gets hurt. Even in these relatively benign circumstances, open refusal can still cause bad press and impugn the reputation of the company by suggesting they will cut corners whenever possible, and look for ways around the letter of the law.

Surreptitious violations of environmental law are treated as a form of white-collar crime. Unlike open refusal to comply, surreptitious violations means the noncomplying company intends to conceal the fact of noncompliance, and something more substantive than technical requirements is usually at stake. Examples of surreptitious violations of environmental law include: dumping hazardous waste into secluded water bodies rather than paying for it to be hauled to a chemical treatment plant; littering or burning garbage instead of sending waste to landfill; using illegal pesticides in agricultural operations; surpassing regulatory limits on the emissions of airborne pollutants; destroying wetlands; spilling oil; and falsifying lab reports or committing fraud to avoid compliance.[18] When convicted of intentional violations of environmental law, the culpable party may face fines, probation, jail time, permit revocation, or all of the above. When the culpable party is a corporation, the financial penalties may be so high that they more than offset whatever gains the company experienced from the violation. The U.S. Sentencing Guidelines and many regulatory statutes require penalties for noncompliance to be calculated precisely according to this model, in order to disgorge ill-gotten gains.

Other legal regimes discussed in this book, such as the Occupational Health and Safety Act, use a different rubric for intentional violations—specifically, willful, serious, or repeat violations. We will discuss these in their respective section. For now, the take-away is simply that intentional,

as opposed to accidental, violations of law result in harsher monetary civil penalties, and may also carry criminal charges.

Regulatory Arbitrage

In the same vein as intentional violations of environmental law, some multinational companies can avoid compliance through *regulatory arbitrage*. When a company operates across the globe, its operations are subject to compliance costs from more than one national jurisdiction. Suppose a certain manufacturing process for a computer part produces hazardous waste as a byproduct. Hypothetically, in Country A, hazardous waste must be disposed of in special sealed containers, whereas in Country B, there is no legal standard for the disposal of hazardous waste at all. In this scenario, if the computer parts company is doing business in Country A and B, it could shift manufacturing operations to Country B in order to enjoy the benefits of the lax regulatory standards. In this way, multinational corporations can dodge environmental safeguards in the process of regulatory arbitrage. (These were the general market conditions before the Basel Convention on disposal of hazardous waste became international law.) Although a company committing regulatory arbitrage may improve their financial bottom line, this is only at the cost of increased pollution in a nation with weak governance structures. Aside from the financial benefits, companies considering regulatory arbitrage should consider the reputational costs of such decisions when word gets back to investors and customers.

Key Terms

mere compliance
risk management
social license to operate
reputation capital
open refusal
accidental violations
surreptitious violations
regulatory arbitrage

Practical Applications

1. Survey all aspects of corporate activity for legal compliance issues.
   a. Identify the activities that generate the most compliance issues.
   b. Research the potential causes and possible resolutions to these issues.
2. Identify how legal compliance fits within your company's enterprise risk management program.
   a. What risks has your company experienced as a result of compliance challenges?
   b. Develop protocols in such a way as to ensure legal compliance is a byproduct of employee work rather than merely a goal.
3. Identify the actors that constitute your company's "social licensors."
   a. Develop a communications and outreach program to solicit feedback from these stakeholders.
   b. Encourage dialogue where feasible with social licensors in advance of business decisions that carry the potential for significant adverse social, economic, or environmental impacts.
4. Identify the conditions or requirements included in your company's social license to operate.
   a. Develop a Venn diagram to determine where social, economic, and legal license requirements overlap, and where they conflict.
   b. Wherever feasible, strive to meet and exceed social expectations.
5. For any corporate activity that violates applicable license requirements, identify whether this violation is done openly, accidentally, or surreptitiously.
   a. For open violations, consider whether these are consistent with your social license to operate. For accidental violations, consider whether protocols may be improved to reduce their occurrence.
   b. For surreptitious violations, consider whether they could be eliminated through adoption of best management practices.

PART II

Legal Compliance in Sustainable Supply Chain Management

Supply chain management (SCM) is the design and management of flows of products, information, and funds throughout the network of all entities involved in producing and delivering a finished product to the final customer, and includes sourcing and transporting raw materials, manufacturing and assembling products, storing goods in warehouse, order entry and tracking, distribution, and delivery to final customer.[1] This chapter will discuss two emerging legal trends that define the landscape of sustainable SCM. Social impacts of supply chains are addressed in the section on human trafficking. The sections on extended producer responsibility and product design address the environmental impacts of supply chains for consumer products.

Focusing on Impacts Upstream and Downstream

In contrast to our discussion of the direct social and environmental impacts of operations management, sustainable SCM focuses on impacts that occur upstream (on the part of suppliers) and downstream (on the part of consumers). To be sure, there are many more legal and policy issues affecting sustainable SCM outside of human trafficking and extended producer responsibility. The downstream environmental impacts of supply chains stem from the procurement and disposal of products, whether for agricultural, industrial, household, or personal uses. The upstream environmental costs associated with procuring and moving physical things, include strip-mining and clear-cutting forests to produce raw materials; emitting particulates, ozone, and greenhouse gases from global transport vehicles; water, air, and land pollution from pipelines, smokestacks, and solid waste;

air conditioning for warehouses and shipping containers; and electronic and plastic waste from product and packaging disposal after consumer use.

The social impacts of supply chains stem from the utilization and management of labor on the part of suppliers, whether for raw materials, goods, or services. When sourcing labor from overseas, supply chain managers must be attentive to the labor practices of suppliers, even when there is little visibility up the supply chain. Poverty wages, harsh labor conditions, and even indentured servitude are not uncommon problems faced by global supply chain managers, even for the largest of companies such as Nike and Apple. Nike has dealt for over a decade with accusations of "sweatshop" labor conditions in Southeast Asian apparel manufacturers, running a corporate social responsibility campaign and facing lawsuits from consumers along the way. Apple received a lot of unwanted attention when employee suicides occurred at Foxconn, its primary parts supplier for the iPod and iPhone in China. Apple has since conducted a wave of audits and has started a campaign to address the issue of labor practices in its overseas suppliers.

Global supply chains span multiple countries each with overlapping, sometimes inconsistent laws and regulations. Sourcing from countries with little or no regulatory oversight increases the risk of running afoul of sustainable SCM policies and practices. Compliance at home and abroad with laws, regulations, and public and environmental policy can reduce these risks. Suppliers located in jurisdictions outside of the United States may be subject to more or less stringent regulations, and many nations give deference to the laws of trade partners. The regulations governing overseas suppliers are therefore perhaps equally relevant to U.S. companies as U.S. law. For instance, the Lacey Act in the United States prohibits the import of goods harvested abroad illegally.[2] Supplier conduct that is illegal in the country where the supplier is based—say, poaching a protected species—can trigger liability for the buyer in the United States. This "piggyback" effect of different national legislation requires importing companies to understand the legal landscape of their supplier in order to monitor compliance.

From a SCM perspective, all of the pollution generated by the activities of suppliers, and all of the labor conditions used by suppliers, add up to the total social and environmental impacts of your supply chain. Supply chain managers must be aware of the environmental and social footprint both upstream and downstream.

CHAPTER 3

SCM Social Impacts

Human Trafficking

With an estimated 27 million people caught in the web of human trafficking, there are more humans in slavery today than ever before. According to the nonprofit supply chain slavery abolition group Made in a Free World, a slave is "anyone who is forced to work without pay, being economically exploited, and who is unable to walk away."[3] Slavery includes all forms of involuntary servitude, but is especially prevalent in situations where unscrupulous employers exploit workers rendered vulnerable by adverse local conditions such as unemployment, poverty, corruption, and so on. "Immigrants are particularly vulnerable, but individuals also may be forced into labor in their own countries. Female victims of forced or bonded labor, especially women and girls in domestic servitude, are often sexually exploited as well."[4]

Human trafficking is a method of obtaining no or low-cost employees by violating their basic human dignity. Human trafficking is a crime under international law. Article 3 of the United Nations' *Trafficking in Persons Protocol* provides an operative definition of human trafficking according to a rubric. A person or company is guilty of human trafficking if they perform one of the listed acts, using a listed method, for any of the listed purposes. See Table 3.1.

Article 5 of the United Nations' *Trafficking in Persons Protocol* calls upon United Nations member states (virtually the entire civilized planet) to pass national legislation that criminalizes human trafficking according to this rubric. Expect the trend to grow at the national level as more governments and consumers become increasingly concerned about what goes on at the less visible end of supply chains for goods and services.

Human trafficking defined by international law covers the worst of conceivable offenses against human dignity, such as kidnapping children

Table 3.1 Operative definition of human trafficking[5]

Engages in acts such as:	+ By any of these methods:	+ For any of these purposes:	= Criminal human trafficking
Recruiting	Threat or use of force	Exploitation	
Transporting	Coercion	Prostitution	
Transferring	Abduction	Sexual exploitation	
Harboring	Fraud	Forced labor	
Receipt of persons	Abuse of power or vulnerability	Slavery	
Hiring	Giving payments	Removal of organs	

for sexual exploitation, which are unlikely to cause any confusion. But it also covers scenarios that are not as clearly reprehensible. It is not hard to imagine that a company sourcing chocolate ingredients from a developing country, for instance, could unintentionally run afoul of international law under this rubric. What if a third-tier supplier recruits impoverished youth by promising meals, to engage in labor on a farm for less money than a living wage? According to the "act, method, purpose" formulation of Article 3, this could very well constitute human trafficking: the act of recruiting persons by a method that involved taking advantage of their vulnerability for the purpose of exploiting low wage demands. So, there are gray areas in the topic of fair labor practices where our moral intuition may hesitate because of the circumstances.

Cross-cultural ethical judgments must be sensitive to disparities between the economic conditions of the consumer and the economic conditions of the supplier laborers. Whether the scenario constitutes human trafficking depends upon the facts on the ground, but from an abstract point of view, it is not hard to see how consumers in a developed country could be disquieted by the idea that their products were procured from suppliers engaging in even borderline instances of human trafficking. The response from a sustainable company should be either to cease sourcing from regions where there is questionable compliance under United Nations protocols, or to engage suppliers from those regions in order to bring them into compliance. For a conscientious company, there is no

in-between: either discourage bad practices, or encourage better practices, but do not sit idly by or take advantage of supplier misconduct.

Not all nations have passed criminal laws to address human trafficking, but some jurisdictions are making strides in that direction. Perched along the majority of the United State's western seaboard, the state of California is home to billions of dollars of annual imports from around the world, and constitutes the eighth largest economy on the planet. As such, companies with globally distributed supply chains often import goods through California ports to reach consumers based in the United States.

In order to eradicate human trafficking from businesses operating within their state, California lawmakers passed the *California Transparency in Supply Chains Act* to require retailers and manufacturers with $100 million in gross worldwide receipts doing business in California to publicly disclose their efforts to eradicate human trafficking from their supply chains.[6]

The California Transparency in Supply Chains Act requires regulated companies to disclose the extent of compliance with five specific initiatives designed to expose and eliminate human trafficking:

1. The organization's slavery and human trafficking risk levels are verified by a third party.
2. Supply chain audits are independent and unannounced, where standards are set and suppliers are audited against those standards.
3. Direct suppliers are contractually obligated to certify compliance with human trafficking laws.
4. Existing internal accountability mechanisms ensure adherence to laws and self-imposed standards, and
5. Employee training to identify, mitigate, and report risks of human trafficking in the organization's supply chain.

Although the law does not require companies to eradicate human trafficking per se, it requires them to "fess up" with consumers and the public about what they are doing to address this heinous labor problem. The California law promotes transparent supply chains by forcing companies to disclose information. Companies that are doing something about the problem get credit for those efforts, whereas companies that have not taken steps to look into human trafficking in their supply chain must

admit that fact publicly. In this way, the law creates incentives for sustainable SCM, without necessarily mandating sustainable SCM.

Key Terms

supply chain management
human trafficking
trafficking in persons protocol
California transparency in supply chains act

Practical Applications

1. Develop a company policy against human trafficking and require suppliers to abide by this policy.
   a. Map your company's suppliers through as many tiers as possible.
   b. Educate your suppliers as to what would constitute human trafficking.
   c. Might any of them be engaging in human trafficking?
2. Improve visibility along your supply chain.
   a. How much do you really know about the activities of your second and third tier suppliers?
   b. Create a risk profile of your second- and third-tier suppliers.
3. Build social sustainability into your supplier selection process.
   a. Continually aim to select suppliers with less risk of adverse social impacts than your previous suppliers.
   b. Reward sustainable suppliers with competitive prices. Consider this an investment into a resilient supply chain.
4. Assume one of your suppliers is engaged in human trafficking.
   a. Do you engage your supplier to try to eradicate this practice, or do you simply terminate them?
   b. What kinds of protocols could your company implement to avoid human trafficking risk?
5. Integrate social sustainable strategy into SCM practices.
   a. Identify the communities affected by your company's supply chain.
   b. Take measures to reduce adverse impacts to these communities.
   c. Go beyond mere harm-avoidance to promote shared value-creation through your supply chain.

CHAPTER 4

SCM Environmental Impacts

Supply chain management (SCM) involves not just how the people who produce the goods at third-, second-, and first-tier suppliers are treated, but also how the goods themselves, once they've been produced and sold, are disposed. How do we manage the entire life cycle impacts of products from cradle to grave? That question is met with an answer in the form of extended producer responsibility (EPR).

Cradle to grave is a descriptive term that refers to the life cycle of a product from procurement of raw resources to manufacture and production, distribution, consumption, and disposal (to put it simply, from the birth to the death of the substances used in products). The cradle to grave concept will be discussed at greater length in Chapter 7. A distinct but related concept is *cradle to cradle*, a prescription for sustainable product design that allows disposed product ingredients to be reincorporated into the product supply chain as raw material inputs. Cradle to cradle design reduces the life cycle economic, social, and environmental impacts of products by closing the loop on raw materials in the production process.

Technically, product design falls under the rubric of marketing because it is ultimately the basis for consumer expectations. Product design decisions determine what can and should be said about a product when it is marketed. We discuss marketing the social and environmental attributes of products in Part IV, Chapter 9. However, product design also falls under the rubric of supply chain management. The product design setting is where the environmental and human health impacts of products are determined, consciously or not, by the materials, production methods, and product features that are built-in to product design choices. Product design decisions affect the entire supply chain for each product.

Extended Producer Responsibility

EPR, otherwise known as *product take-back*, requires manufacturers to take responsibility for the disposal of waste from their products. EPR creates the incentives necessary to encourage producers to reduce the volume of packaging and substitute materials to create recyclable products.

Lawmakers across the developed world are considering proposals for EPR to address the exponential growth of waste resulting from consumer product disposal. Although recycling of cans and bottles is common, the growing trend for recycling is in the electronics sector because of the increase in product offerings, their relatively short *product life cycle*, and the plethora of waste streams generated by electronic sales and use.

Consider the cell phone, for instance. The various waste streams from a single cell phone purchase may include the box in which the cell phone is sold, the lithium battery, the hard plastic case, the power cable and charger jack, the headset, the protective cover, the internal circuitry, and so on. Millions of tons of *electronic waste* are generated annually by the disposal of DVD players, cell phones, portable music devices, cameras, GPS systems, and more, and each year these products are replaced with newer versions or different models that render prior versions obsolete.

Consumer good retail produces unsustainable amounts of slow-degrading or nondegradable waste. The sheer volume of obsolete or discarded products and excessive product packaging are beginning to exceed society's waste disposal capacity. Landfills are filling up. In the last few decades there has been a dramatic increase in the volume of paper and plastic waste being generated as per-capita consumption of packaging has increased in all developing countries.[1] The growing popularity of single-serve packaging, compared to bulk packaging, also contributes to unsustainable waste production.

Questionable consumer electronics marketing and product design trends, such as the artificial demand cycle and *planned obsolescence*, respectively, have contributed to a boom in toxic electronic waste. Planned obsolescence is a somewhat controversial business strategy that plans the process by which a product becomes unusable or unfashionable, and builds this obsolescence into the product design from inception in order to keep customers coming back for replacement products.[2] Every new

product line essentially means billions of pounds of electronic waste from disposed obsolete products.

In order to address unsustainable amounts of electronic waste, the European Union put forward financial and capacity-planning requirements for manufacturers to ensure obsolete products and packaging are collected and processed instead of simply disposed through landfill or incineration. The European Union enacted the Directive on *Waste Electrical and Electronic Equipment* (WEEE) to reduce electronic waste, increase rates of product recovery and material recycling, reduce the life cycle environmental footprint of these products, and to shift the responsibility of electronic product disposal to the manufacturer rather than consumers.

Although the United States has not passed federal legislation on product take-back, several nations throughout the world have enacted programs to create electronic waste recycling programs that are funded by either manufacturers (through take-back) or consumers (through recovery fees). EPR closes the loop of supply chains, ensuring waste does not leave the production cycle over the life of a product, but is rather absorbed back into the production cycle as refurbished products, reusable parts, and reprocessed materials. In this way, EPR benefits the environment as well as production costs by limiting the waste outputs of manufacturing processes by redirecting them back as inputs.

For companies that do not build capacity for product returns, recycling, and refurbishing, EPR will simply increase costs in the form of disposal and reverse logistics. For companies that are capable of accepting responsibility for their own products through the product life cycle, EPR will actually save money by reducing resource input costs. As EPR laws and regulations are implemented, producers will be incentivized to rethink products at the design stage to head off returns, reuse, and disposal costs that happen later in the product's life cycle.

Product Design

Design is the process of transforming legal, market, or functional requirements into the technical specification for a product. *Sustainable product design* means "improving the environmental performance and social impact of a product's life cycle by integrating environmental and social

aspects into product design."[3] Companies can incorporate sustainable performance standards at the product design stage to manage *downstream* environmental and social impacts of products—that is, to limit adverse impacts associated with product use, consumption, and disposal. Additionally, sustainable performance standards can be incorporated at the product design stage to manage *upstream* environmental and social impacts—that is, to keep certain kinds of substances out of the product entirely, which can generate environmental and human health benefits upstream via changes in sourcing raw materials for production.

Specific standards for sustainable product design vary widely across product categories. A tractor will have different sustainable performance design specifications than a toaster. However, sustainable product design metrics typically apply to the following aspects of a product's performance:

- *Climate change impacts*: the total amount of greenhouse gas emissions generated by the supply chain and operations activities required to bring a product into existence.
- *Water impacts*: how much is consumed in the production process, and how much water pollution is emitted by the production process.
- *Energy impacts*: how much energy is consumed by production, and how much energy the product consumes over its life cycle (in terms of fuel efficiency). This metric also tracks the extent of energy that comes from renewable sources.
- *Raw materials*: the extent of natural resource consumption associated with production, including the resource depletion versus replenishment rate, the extent of material that are derived from renewable sources, and whether material is sourced from an endangered or protected species.
- *Waste*: the volume of waste in all environmental mediums (water, air, solids) generated by production activities, less the amount diverted from the waste stream through recycling and source reduction.
- *Hazardous substances*: the volume of hazardous materials generated by production before and after treatment to reduce hazardous characteristics.

Legislation prohibiting certain kinds of chemicals from products are becoming increasingly popular around the globe. Global ozone-depleting substances (such as CFCs) have been largely phased out of refrigerants and aerosol cans due to international legal norms and industry-wide compliance. A large portion of laws governing the environmental design of products apply to electronics, given the volume of heavy metals and synthetic chemicals involved in the production process for these products. These substances pose an environmental and human health risk at virtually every stage of the product life cycle, from raw material extraction, through manufacture, consumption, and disposal. The best way to address these risks is to target product design. Prohibiting substances from a product outright tends to nip the problem in the bud.

Through the *Restriction of Hazardous Substances Directive*, the European Union regulates hazardous substances in the supply chains of electronic products by prohibiting parts manufacturers from using six dangerous chemicals, including lead and mercury.[4] Laws that prohibit substances deemed dangerous to the environment or human health, such as RoHS, present challenging issues to manufacturers to research and develop alternative product components that have relatively benign attributes. In-house toxicology experts may also flag a substance as potentially toxic even if it is not subject to regulation, which may encourage voluntary changes to product design in order to avoid compliance problems down the road.

In 2007, the EU added a new piece of legislation to improve the management of chemicals in supply chains in order to ensure high levels of human and environmental health protection. The *Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals* (*REACH*) creates obligations for each individual substance that a company manufactures, imports, or uses.[5] A company's obligation under REACH depends upon its role in the supply chain of specific substances of concern, but in general, REACH puts a responsibility on industry to assess and manage risks posed by the chemicals in their supply chain, and to inform consumers of appropriate safety information.[6]

In addition to the use of chemicals in products, international laws also impact the way products consume energy when being used. Manufacturers of energy-using products (products dependent upon energy input from electricity, fossil fuels, or renewable sources)[7] must comply

with the *Eco-Design of Energy-Using Products (EuP) Directive*[8] by reducing the energy consumption and environmental impacts associated with the product's life cycle. The policy of this directive accurately explains why targeting product design makes the most sense for improving the sustainable performance of products: "Action should be taken during the design phase of EuPs, since it appears that the pollution caused during a product's life cycle is determined at that stage, and most of the costs involved are committed then."[9]

China took a slightly different approach on substances of concern than the European Union when it enacted the *Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation (China RoHS)*. This framework prohibits the same six dangerous chemicals from product design as the EU, but also requires manufacturers, importers, and distributors of electronics to obtain product testing and compliance certification from a Chinese-based laboratory.[10] Electronic products containing hazardous substances sold in China must be labeled accordingly, the hazardous substances must not exceed specified maximum concentration levels, and the products must be tested for hazards according to approved testing methods.[11]

The United States does not have comprehensive legislation prohibiting the use of hazardous substances in the design of products. In general, the U.S. policy toward hazardous substances is not one of prohibition but rather transparency: you can generate hazardous waste and you can include hazardous features in products, as long as you do not lie about it. This shifts the burden of regulating hazards in consumer products away from the Environmental Protection Agency and onto the Federal Trade Commission (FTC).

In 2009, the FTC sent warning letters to a few major retailers accused of mislabeling as organic "pure bamboo" crib sheets, underwear, t-shirts, and baby blankets. The textiles used in these so-called environmentally friendly products were in fact made of bamboo fiber; however, it was subjected to the same chemical process used to manufacture rayon, a process that generates hazardous air pollutants, and none of the bamboo plant's unaltered fiber was actually woven into the fabric. In January 2013, Sears, Amazon, and Macy's agreed to a $1.26 million settlement and an ongoing monitoring and compliance program.[12] Although the companies neither

admitted nor denied the allegations, they ceased labeling the products as made from bamboo fiber because they were basically made of rayon.

According to a lawyer from the U.S. Justice Department's civil litigation division involved in the case, "Consumers pay a premium for products labeled and advertised as being made from bamboo because they believe that the product is made from a renewable resource and is good for the environment. Consumers expect that they will get what they pay for; here, they didn't."[13] We discuss legal compliance in the context of marketing environmental attributes in Chapter 10. For now, this example points out nicely how supply chain decisions affecting product design have ramifications for marketing the environmental attributes of products. Additionally, it goes to show how different legal jurisdictions grapple with the environmental and public health risks associated with product design.

Key Terms

product life cycle
electronic waste
planned obsolescence
waste electrical and electronic equipment directive
extended producer responsibility
product take-back
sustainable product design
restriction of hazardous substances directive
REACH
design of energy-using products (EuP) directive
China RoHS

Practical Applications

1. If your company sells products, reduce the life cycle environmental impacts of each unit.
   a. Identify the resources and environmental impacts associated with the entire supply chain for a single product life cycle.
   b. Identify stages in the product's life cycle where the most substantial environmental footprints occur. This is where innovation efforts should concentrate.

2. If your company sells electronics, reconsider the planned obsolescence business model.
   a. Conduct market research to determine whether more durable, recycled, or refurbished product markets are available to your company.
   b. Consider the price premiums available to electronic product manufacturers offering goods with longer life cycles and smaller environmental impacts.
3. Assume you manage the supply chain for a company not subject to an EPR program.
   a. Determine whether there is a business case for closing the loop of your supply chain. Think in terms of recycling, reuse, and source reduction through product design.
   b. If the law was to change tomorrow, how would your company bear the cost of product take-back requirements? Would these costs be internalized, or rather, externalized to customers?

PART III

Legal Compliance in Sustainable Operations Management

The process of transforming a design into a material object, and all of the activities necessary to bring this transformation about, falls under the rubric of *operations management*. Operations management, otherwise known as managing the production process, is subject to a wide array of laws concerning the construction of new facilities, the chemicals and substances used, workplace safety, and the emission of pollutions from manufacturing and processing activities. *Sustainable operations management* means reducing or eliminating hazards in the workplace and pollutant emissions in business operations.

A series of laws apply in the United States to manufacturing, production, materials processing, mining, construction, and waste management as sources of industrial pollution. This section provides a brief introduction to a few of the most salient aspects of several environmental laws and concludes with a description of the law touching on the social aspect of sustainable operations. The environmental trinity of Clean Water Act, Clean Air Act, and Resource Conservation and Recovery Act seek to protect the nation's water, air, and land, respectively, from the adverse impacts of industrial pollution. The Occupational Health and Safety Act addresses safety in the workplace. Outside the context of workplace safety, which is overseen by the United States Occupational Health and Safety Administration, the United States Environmental Protection Agency (EPA) administers the laws discussed in this Part. With jurisdiction spanning all environmental media—air, water, and land—the role of the EPA looms large in the compliance efforts of all companies with a substantial environmental footprint.

The EPA Office of Enforcement and Compliance Assurance takes actions to enforce federal environmental laws and maintains a website to promote transparency. This website includes enforcement actions taken by the agency, the extent of penalties assessed, the estimated cost that affected companies will be required to take to come into compliance, and the cost of any supplemental environmental remediation projects that are conditions of settling enforcement matters. The *Enforcement and Compliance History Online* (ECHO) website provides a searchable database that can be sorted by location, pollution type, industry source, legal requirement, cost, and more, enabling us to get a granular look at where compliance issues happen and why.[1] The business examples in the *Business Ramifications* discussions under the following Water Pollution, Air Pollution, and Land Pollution sections are drawn from ECHO database queries sorted by the most expensive compliance and enforcement actions taken against companies under the key provisions of law discussed in this book. Each section begins with a brief description of the historical, environmental, and legislative context from which these laws emerged.

CHAPTER 5

Operations Management and Water Pollution

History

The nation's war effort for World War II involved a rapid increase in industrial activity directed toward the production of weaponry, armored tanks, airplanes, munitions, and the like, causing a major increase in water pollution levels. The U.S. Congress responded by introducing the Water Pollution Control Act of 1948.[2] The law was designed to protect the nation's waterways from industrial pollution, but the efficacy of the law depended upon the various states to develop and enforce adequately protective regulations. As it turned out, the dependence on state enforcement was the law's fatal flaw, and it was not fully addressed in the subsequent six amendments and additions to water pollution control laws at the federal level.[3]

Finally, in 1972, almost a quarter century after the first federal water pollution law was enacted, Congress passed the Federal Water Pollution Control Act, known as the Clean Water Act,[4] which provided the EPA with ample enforcement authority and prohibited the discharge of any pollutant into the waterways of the United States except as permitted by the EPA. Today, the mission of the Office of Water within the U.S. EPA is to ensure safe drinking water; restore and maintain oceans, watersheds, and aquatic ecosystems to protect human health and support economic and recreational activities; and to provide healthy habitat to protect fish, plants, and wildlife populations.

Scope and Applications

The purpose of the *Clean Water Act* is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.[5] The primary

mechanism for doing so is through a permitting system, whereby the EPA is able to regulate how much and which kinds of pollutants are discharged, and into which water bodies. The *National Pollutant Discharge Elimination System* (NPDES) provides companies with a permit to discharge pollutants into water, within the parameters set by two types of limitations.

National Pollutant Discharge Elimination System

The Clean Water Act NPDES pollution control program for point sources (defined later in the chapter) generally takes the form of (1) nation-wide technology-based water quality standards[6] as well as (2) watershed-specific water quality standards based on state requirements for reducing contaminants in surface waters.[7]

Point Source Technology Standards

Point sources of water pollution are isolated, discrete conveyances of effluent, such as pipes or culverts carrying wastewater, which discharge into surface waters.[8] Most factories that use water, such as manufacturing plants, have point sources of water pollution. In order to comply with the conditions on a NPDES permit for point sources of water pollution discharge, a company must adopt wastewater standards that reflect "the greatest degree of effluent reduction … achievable through application of the best available demonstrated control technology."[9] This standard is called a *technology-based standard* because it specifies a level of pollution reduction attainable by type of water filtration technology. Technology-based standards are industry specific.

Nonpoint Source Water Quality Standards

Nonpoint sources of water pollution are discharges of pollutants into water bodies by diffusion or seepage. Examples of nonpoint sources of effluent are mining operations that seep liquid pollutants such as acid drainage water from coalmines, or agricultural runoff such as pesticides, or chemicals stored at a construction site that are washed into a drain during a

rainstorm. In order to comply with the conditions of a NPDES permit for nonpoint sources of water pollution discharge, a company must meet additional limitations that are necessary to address the waste treatment needs of a region and are consistent with best management practices for specific kinds of nonpoint sources.[10]

More than one Clean Water Act restriction can apply to the same company. Imagine a manufacturing company operates within a polluted watershed, is in the midst of constructing a new facility, and is responsible for direct discharges into a nearby stream. Various permit conditions could be imposed to address wastewater going to the nearby public wastewater treatment facility, runoff from the construction site, and the effluent from the factory pipeline into the receiving water body.

Stormwater Runoff: General Construction

Stormwater runoff means precipitation from a storm that flows over a worksite, picking up pollutants along the way and transporting those pollutants into nearby water bodies.[11] Rainwater that floods a construction site, for instance, can pick up debris and chemicals from the work activity and substances at use at the site, and deposit these pollutants into nearby water systems. In that way, stormwater runoff can have a substantial adverse impact on water quality. Sediments from earth moved at construction sites can destroy aquatic habitats in the rivers, lakes, and coastal water systems adjacent to the construction site. Debris swept off of job sites can not only disrupt the flow of nearby waterways but can also harm or kill wildlife.

All construction site operators engaged in clearing, grading, or excavation activities that disturb one acre or more or land are required to get a NPDES permit for stormwater discharges.[12] Where the various states have not established a stormwater NPDES permitting programs, EPA requires operators to meet the Construction General Permit (CGP).

Polluted stormwater typically runs off into Municipal Separate Storm Sewer Systems (MS4) such as drains, gutters, and ditches, which ultimately discharge this stormwater untreated into local water bodies. In order to keep harmful pollutants from reaching MS4s, operators of construction sites must develop a stormwater management program pursuant to their NPDES permit to discharge.[13]

The *Stormwater Phase II Final Rule*: Construction Site Runoff Control Minimum Control Measure[14] forces MS4 operators to come up with a plan that regulates the construction activities in the area that could cause stormwater runoff. The municipality in which the MS4 operates is required to pass an ordinance requiring implementation of erosion, sediment, and waste controls at construction sites; consider the water quality impacts of proposed construction site plans; inspect construction sites and enforce pollution controls measures with sanctions; and determine best management practices and measurable goals for stormwater pollution prevention.[15]

Stormwater Runoff: Industrial and Commercial Facilities

A different set of rules applies to stormwater from industrial and commercial facilities, rather than simply stormwater from construction sites. These facilities must obtain permission for stormwater runoff if (a) they have a point source stormwater discharge coming from their industrial or commercial activity directly into the waters of the United States or an MS4, and (b) they are on the following list of industrial activity categories for NPDES stormwater permitting:[16]

1. heavy manufacturing (i.e., paper mills, chemical plants, petroleum refineries, and steel mills and foundries);
2. coal and mineral mining and oil and gas exploration and processing;
3. hazardous waste treatment, storage, or disposal facilities;
4. landfills, land application sites, and open dumps with industrial wastes;
5. metal scrapyards, salvage yards, automobile junkyards, and battery reclaimers;
6. steam electric power generating plants;
7. transportation facilities that have vehicle maintenance, equipment cleaning, or airport deicing operations;
8. treatment works treating domestic sewage with a design flow of 1 million gallons a day or more; or
9. light manufacturing (e.g., food processing, printing and publishing, electronic and other electrical equipment manufacturing, and public warehousing and storage).

Obtaining a permit to discharge stormwater from an industrial facility is generally faster if the operator applies for a multisector general permit (MSGP) rather than an individual facility-specific NPDES permit. MSGP permits require the operator to develop and put into place a *Stormwater Pollution Prevention Plan* (SWPPP) before submitting a Notice of Intent form.[17]

SWPPPs typically include (1) an identification of all potential pollution sources reasonably expected to affect water quality from a stormwater discharge from the applying facility; (2) a description of the practices to reduce stormwater pollutants from these sources, including collecting systems, pretreatment, vegetative plantings, flow reduction, and covering exposed materials; (3) a description of the site characteristics such as the precipitation levels, status of receiving water bodies, and proximity to critical habitats; and (4) a description of the staff resources dedicated to stormwater pollution prevention.[18]

Wetlands and Streams: Mitigation Banking

Wetlands and streams are aquatic resource areas protected by Section 404 of the Clean Water Act. Construction activities taking place in wetlands are subject to a special permitting program.

Where activities permitted under the Clean Water Act would cause an "unavoidable impact" to the wetland, such as infilling a marsh to build a parking lot, the mitigation banking program comes into play. A *mitigation bank is* defined as an aquatic resource such as a wetland or stream that has been established and enhanced solely to provide compensation for the impacts to aquatic resources permitted under the law.[19] For every impaired aquatic function that results from permitted activity under the Clean Water Act, the operator may purchase "compensatory mitigation credits" from a mitigation bank in a specified geographic area.

The goal of mitigation banking is to provide a sound mechanism by which wetlands and streams might be developed while producing zero net loss of aquatic resources. In addition to supervision by an Interagency Review Team, mitigation banks consist of three basic elements:[20]

1. *The bank site:* the physical acreage of established and enhanced aquatic resource.

2. *The bank instrument:* a formal agreement between the mitigation bank owners and the regulator establishing liability, performance standards, management practices, monitoring requirements, and conditions for bank credit approval.
3. *The service area:* the geographic boundary within which impacts to aquatic resources permitted under the Clean Water Act can be compensated for at a specific bank.

The mitigation bank instrument specifies how many credits are available for sale to compensate for aquatic impacts in a given region. The bank instrument also establishes the ecological assessment techniques to be used to verify that the credits sold by the bank actually provide the ecological functions that were impaired by the permitted impacts. These features enable Clean Water Act permittees to transfer liability for mitigating aquatic impacts to a third-party mitigation bank owner. This enables permittees to avoid designing, constructing, monitoring, and protecting mitigation banking sites.[21] This compliance flexibility has spawned an array of privately owned entrepreneurial mitigation banks, "showcasing the synergies that can arise between effective environmental protection and economic expansion."[22]

Business Ramifications

Water pollution resulting from activities in the Oil & Gas sector are principally addressed under the Oil Pollution Act rather than the Clean Water Act. Violations of the Clean Water Act might teach important lessons about compliance for companies in other sectors outside of O&G. Consider the examples of Roquette (a vegetable processing company), Massey Energy, and Trident Seafood Corporation.[23]

Roquette Group: NPDES Permit Violations in the Mississippi River

The Roquette group specializes in the conversion of vegetable crops into raw materials such as fibers essential for a variety of industrial uses. In November 2012, the EPA fined Roquette $4.1 million for a number of NPDES permit violations at a production site in North America. The company was discharging thousands of gallons of untreated industrial

waste into the Mississippi River and a nearby creek, in excess of the effluent limitations contained in their discharge permit.

Massey Energy Corporation: NPDES Program Violations in Coal Country

Massey Energy Company and its subsidiaries operates numerous coal mines in West Virginia and Kentucky. After violating the effluent limits of the applicable NPDES permit, and releasing coal processing slurry and wastewater into the environment without a permit, in May 2007 the EPA fined the company $13.3 million for violations at West Virginia coal mines and $6.7 million for violations at Kentucky coal mines.

Trident Seafood Corporation: NPDES Permit Violations in Alaskan Waters

Trident Seafoods Corporation operates 14 different seafood processing plants in Alaskan waters, including the largest such plant in North America. In September 2011, the EPA fined Trident for failing to conduct dive surveys to assess the impacts of waste effluent in Bristol Bay, for exceeding the size of waste piles allowed on site, and for unauthorized discharges of pollution into U.S. waters. The company was penalized $2.5 million for NPDES permit violations, in addition to facing injunctions to construct a new fishmeal processing plant with the capacity to handle processing waste from all of Trident's local sources of that pollution, and to reduce the amount of water pollution generated at Trident facilities.

Key Definitions from the Clean Water Act

Waters of the United States means

- All waters currently, formerly, or potentially used for interstate commerce, including those subject to the ebb and flow of the tide
- All interstate wetlands
- All *intrastate* lakes, rivers, streams, and wetlands, the use or degradation of which could affect *interstate* or foreign commerce*

Pollution means the man-made alteration of the chemical, physical, biological, and radiological integrity of water.†

Water quality standards are provisions of law that designate uses for waters of the United States, as well as the water quality criteria for those uses, and which serve the purposes of the Clean Water Act.‡

Serves the purposes of the Act means a water quality standard provides for the protection and propagation of fish, shellfish, and wildlife populations, and protects designated recreational, agricultural, industrial, navigation, and drinking water uses of that water.**

Source: *Clean Water Act Regulations, 33 CFR Part 328: Definition of Waters of the United States, § 328.3 Definitions.

†*Clean* Water Act Regulations, 40 CFR Part 130: Water Quality Planning and Management, 130.2(c).

‡*Clean* Water Act Regulations, 40 CFR Part 130: Water Quality Planning and Management, 130.2(d).

***Clea*n Water Act Regulations, 40 CFR Part 130: Water Quality Planning and Management, 130.3, Water Quality Standards.

Key Terms

operations management
sustainable operations management
enforcement and compliance history online
Clean Water Act
national pollutant discharge elimination system
point source
technology-based standard
nonpoint source
stormwater runoff
MS4
stormwater pollution prevention plan
water quality standards
mitigation banking

Practical Applications

1. Identify all of the sources of water pollution for which your company is responsible.
   a. Distinguish between point and nonpoint sources.

   b. Distinguish between the different kinds of pollutants discharged and the technology-based and water-quality-based effluent limitations that apply.
2. Identify all of the water systems impacted by your company's water pollution.
   a. Distinguish between aquatic ecosystem impacts, human health impacts, and other impacts (recreational or agricultural impairment, etc.),
   b. Determine who the stakeholders are for each impacted water system (domestic users, commercial users downstream).
3. Reduce water pollution as far as feasible.
   a. Compare the costs of modifying the substances used in production versus the costs of installing pollution control technology.
   b. Consider ways to reduce both the toxicity *and* volume of wastewater effluent.
   c. Reduce water pollution through wastewater recycling.
4. Ensure all operations are compliant with NPDES Permits.
   a. Go beyond mere compliance to provide an adequate margin of safety in case of accidental spills.
   b. As part of compliance, perform routine water quality sampling to ensure that pollution controls are actually working.
5. Proactively manage wetland development risks.
   a. Wherever possible, avoid developing in a wetland.
   b. Use mitigation banking to offset unavoidable, authorized impacts to wetlands.
   c. Go beyond mere offsetting harm to promote healthy ecosystems.
6. Proactively manage water contamination at construction and industrial sites. As part of a compliance program for stormwater regulations:
   a. Determine the risk of exposing potential water pollutants at the job site to weather that could cause runoff pollution of surrounding water bodies. Protect potential pollutants from such exposure.
   b. Ensure that all sites are equipped with spill protection and emergency clean-up protocols.
   c. Utilize landscaping techniques to limit pollution runoff into surrounding surface waters, even during storm events.

CHAPTER 6

Operations Management and Air Pollution

History

The development of laws to address air pollution grew from the same historical context as that of water quality laws. In the aftermath of World War II, one of the biggest surges in industrialization in history, the impact of air quality on human health became a growing concern in the United States. Eventually Congress passed the Air Pollution Control Act in 1955, empowering a federal agency (the Department of Health, Education and Welfare) to research the effects of air pollution on human health, but leaving primary responsibility for regulating pollution at the state level.[1]

Congress expanded this narrow role of the federal government over the issue of air pollution by passing the Clean Air Act of 1963, which enabled the same agency to begin collecting scientific data on the effects of air pollution, and to determine the proper criteria for measuring air quality.[2] These two laws did not provide enforcement authority to the federal agency responsible for the public health implications of air pollution. They both vested virtually all enforcement authority at the state level, providing a mere advisory role for the pertinent federal agency. Similar to what happened in the development of water quality law, the absence of meaningful federal government enforcement meant that these laws had little impact on curbing pollution.

The first substantial steps toward federal enforcement of air quality standards came in 1965 and 1967. Congress passed the Motor Vehicle Air Pollution Control Act[3] in 1965, giving the Department of Health, Education and Welfare authority to impose direct federal air pollution control regulations in the form of uniform emission standards for new

vehicles on the basis of "technological feasibility and economic costs."[4] Two years later, Congress passed the Air Quality Act of 1967, which divided the country into overlapping air quality regions (based on pollution levels) and atmospheric regions (based on similar weather patterns and geographic features).[5] The Air Quality Act of 1967 also required states to adopt ambient air quality standards based on pollution criteria developed by the Department of Health, Education and Welfare.

The most salient features of these two laws laid the foundation for the modern air pollution regime in three important ways. First, they addressed both *stationary* (such as factory smokestacks) and *mobile* (such as diesel truck exhaust pipes) sources of air pollution. Second, they targeted *new sources* of emissions (such as a proposed factory construction, or a proposed new vehicle fleet) rather than *existing sources* of emissions (such as established industrial corridors). Third, they introduced *region-specific* ambient air quality standards (such as different rules for pristine versus degraded areas) and *source-specific* technology standards (such as tailpipe emissions control devices).

Despite these steps toward comprehensive federal air pollution controls, these laws remained ineffective at abating the problem of air pollution in the United States.[6] Similar to the trend in water law, a frustration at the lack of efficacy of environmental programs administered by the state and local governments led to the displacement of those programs by sweeping new federal law. The legal instruments inherited from the 1965 and 1967 air pollution laws were largely adopted and improved upon 3 years later with the passage of the *Clean Air Act* of 1970.[7] The Clean Air Act and the panoply of regulations issued pursuant to it "comprise one of the most intricate regulatory schemes in existence, comparable in complexity to the tax laws."[8]

Because of the broader applicability of stationary source regulations, the emphasis of this chapter is on stationary sources of air pollution, since any company that constructs a building with smokestacks is potentially subject to Clean Air Act compliance challenges. This chapter does not address mobile sources of emissions because they apply only to the transport sector. Additionally, this chapter concerns traditional air pollutants rather than greenhouse gas emissions, which are discussed in Part V: Legal Compliance and Climate Change Mitigation. We discuss the features of

the Clean Air Act most relevant to business decision-makers in the next section.

Scope and Applications

At around the same time as the enactment of the first major federal water and air pollution laws, Congress also established the U.S. Environmental Protection Agency, which took over environmental-related duties from the Department of Health, Education and Welfare. The EPA administers the Clean Air Act. In general, the rules of the Clean Air Act discussed here apply only to *major sources* of emissions, which means those sources with the potential to emit 100 tons or more of a specific air pollutant annually. The threshold is lower for hazardous air pollutants because they can do greater damage in lesser volume than conventional pollutants. Small operating facilities, such as a mom-and-pop Laundromat, are for the most part not required to comply with the Clean Air Act (though they may be regulated by state and local authorities).

National Ambient Air Quality Standards

The Clean Air Act requires the EPA to establish primary *National Ambient Air Quality Standards* (NAAQS) necessary to protect *public health* with an adequate margin of safety,[9] and secondary NAAQS necessary to protect *public welfare*,[10] which is defined as the effects of air pollution on soils, water, crops, animals, weather, visibility, economic values, and personal comfort.[11] Part of the EPA's mandate under the Clean Air Act is to set NAAQS for six "criteria pollutants," regulated based on human health- and environment-based scientific criteria.[12] *Criteria pollutants* include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead.

Air quality standards come in two forms: ambient standards and emissions standards. *Ambient standards* are a maximum concentration of a specific pollutant acceptably present in the surrounding air; these standards are uniform nationwide and are designed not for compliance costs but rather the protection of public health and welfare.[13] Ambient standards get their teeth when they are translated into polluter-specific

emissions standards, which do consider compliance costs. Emissions standards are determined as the level of pollution a specific polluter is allowed to emit such that when all polluters in the relevant area are complying with emission standards, ambient standards are satisfied. In this way, ambient standards set the maximum allowable levels of pollution in the nation, and emissions standards set the maximum allowable levels of pollution for each polluter.

Although the EPA develops air quality standards, the various states are primarily responsible for the enforcement of NAAQS. The Clean Air Act requires states to develop general plans to attain and maintain air quality standards throughout the country, as well as specific plans for addressing nonattainment regions (discussed later). These plans—called *State Implementation Plans* (SIP)—are developed by local and state air quality management agencies and subject to EPA approval.[14]

New Source Performance Standards

Emission standards are not the same for all companies that generate air pollution. The differences in requirements depend on what category of emitter the company falls into (a cement factory, a power plant, a materials processing facility, etc.), as well as the size and type of emitter. The EPA establishes unique emissions standards for various categories of stationary sources of air pollution. These category-based emissions standards are called *New Source Performance Standards* (NSPS), and they apply to new sources or existing sources that are subjected to major modifications.[15] NSPS require companies in attainment areas to achieve the level of emissions reduction that would be achievable using the *best available control technology* (BACT) given compliance costs. For nonattainment areas, NSPS requires the level of emissions reduction that would be achievable given the lowest achievable emissions rate (LAER). The primary mechanism for regulating *existing* sources of pollution are the SIPs, because they were "grandfathered" into the Clean Air Act, subject only to air pollution regulation enforced by the state or local environmental agency.

How the NSPS program affects construction-permitting procedures depends upon the region in which the company does business. The Clean

Air Act divides states into distinct areas depending upon the level of air quality:[16] (1) those with pristine air quality, such as national parks; (2) those that have attained the NAAQS, but which may fall below those standards if additional pollution occurs ("attainment areas"); and (3) those with air quality that is worse than the NAAQS ("nonattainment areas"). The *Prevention of Significant Deterioration* (PSD) program applies to both (1) and (2), and the Nonattainment Program applies to (3).

Prevention of Significant Deterioration

Businesses operating in the first two categories of regions are subject to the *PSD* program, which requires special rules to avoid degrading air quality too much. This ensures that areas with air quality superior to the NAAQS continue to enjoy superior air quality even as economic activity expands in those regions. In PSD regions, any company that plans to construct a new major emitting facility, or perform a major modification of an existing facility, must get a preconstruction permit.[17] This permit requires the company to demonstrate that the new facility will achieve an emissions limitation equivalent to the BACT, given compliance costs.[18] The difference between the "BACT" standard when applied to the NSPS versus the PSD is that for NSPS, BACT is set by category, whereas for PSD, BACT is source specific. The BACT standard in a PSD region cannot be less stringent than the BACT standards set by the NSPS for that category of emitter.

Nonattainment Program

Businesses operating in the third category of regions are subject to the *Nonattainment Program*, which requires special rules to ensure that permitted changes in air quality bring the region closer to attainment of the NAAQS. The Clean Air Act can present substantial permitting compliance challenges for companies doing business in a nonattainment region, though the permitting program is tailored to avoid entirely shutting down economic activity in the process of mitigating air pollution from industrial and commercial development. In Nonattainment Regions, any company

that plans to construct a new major emitting facility, or to modify an existing major emitting facility, must get a permit that demonstrates that offsetting emissions reductions have been obtained from the same source or other sources within that nonattainment region.[19] An *offset* is a reduction in emissions that more than compensates for any additional pollution that is expected to come from new or modified existing sources.[20] In other words, in order to add a new facility to a manufacturing compound, the company must demonstrate that they have taken steps to reduce pollution from stationary sources by more than what the new facility would contribute to the total emissions levels of the area. In theory, the Nonattainment Provision's method of conditioning construction permits on offsets allows industrial and commercial development to continue while incrementally lowering the total air pollution load for an area.

In addition to the offset requirement, permit applicants in a Nonattainment Region must also demonstrate that the proposed new source would comply with the *LAER*, which is defined as the most stringent limit for that category of polluter that has previously been required or attained in any state.[21] Lastly, in order to build a new major emitting facility, or to modify one, the company must show that all of its current stationary sources in that region are on schedule for compliance under the Clean Air Act.[22]

Hazardous Air Pollutants

Regardless of whether a company operates in a PSD region or a nonattainment region, the emissions of *hazardous toxins* is subject to stringent regulations. These pollutants are not subject to the same rules as other ambient air pollutants because they are carcinogenic or extremely harmful even at low levels and within the immediate environment. It took two decades of "profound agency inaction" on the question of hazardous air pollutants before Congress passed the 1990 Clean Air Act amendments.[23] These amendments required a technology-based approach "with a health-based standard as a backstop."[24] The *National Emissions Standards for Hazardous Air Pollutants* (NESHAP) program prohibits the emissions of hazardous air pollutants unless they are accompanied by the deployment of specific forms of pollution control technology.

Business Ramifications

BP Amoco: NESHAP-Compliant Technology with a $.5 Billion Price Tag

In the course of the EPA's National Petroleum Refinery initiative in 2001, the EPA took action against BP Amoco for alleged violations of the Clean Air Act at refineries in North Dakota and Utah. These refineries were emitting nitrous oxide and sulfur dioxide (both criteria pollutants that cause acid rain and respiratory illnesses), benzene (a hazardous air pollutant and known carcinogen), and volatile organic compounds (which cause haze and damage the ozone layer). In order to reduce these emissions from stacks, flares, wastewater vents, and leaking valves, BP would have to spend an estimated $500 million on up-to-date pollution control technologies and operational practices. Additionally, the company was assessed a $10 million civil penalty for failure to deploy appropriate pollution control technologies pursuant to the National Emission Standards for Hazardous Air Pollution (NESHAP) program.

Hovensa, LLC.: PSD and NSPS Violations in the Virgin Islands

This case was referred to the U.S. Department of Justice in June 2011 by the EPA for Hovensa's known violations of the Clean Air Act in the U.S. Virgin Islands. The Virgin Islands have superior air quality and are included in a PSD region, which requires the employment of the best available pollution control technology for major emitters. The federal penalty assessed for Hovensa's failure to comply with NSPS for refineries as well as emissions permits in the PSD region was $5.125 million, and the cost for pollution controls that would adequately protect the environment and public health from the emissions at the refinery was estimated at $700 million. Hovensa also agreed to set aside funds into an escrow account to pay for a supplemental environmental remediation projects as compensation to the people of the Virgin Islands.

Lucite International, Inc.: NSPS and NESHAP Violations in Memphis

Lucite International, Inc. manufactures acrylic-based products. In July 2009 the EPA referred this compliance case to the U.S. Department

of Justice for significant excess emissions from a sulfuric acid plant in Memphis, Tennessee. In addition to violations of NESHAP standards for hazardous air pollutants, the company was also noncompliant with NSPS and other Clean Air Act permit conditions. The penalty assessed was $1.8 million. The EPA also sought an injunction to require Lucite to make plant improvements such as modifying startup, shutdown, and malfunction procedures to prevent the bypass of air pollutants through pollution control mechanisms. The estimated cost of compliance with these suggested modifications was $16.3 million.

Key Definitions from the Clean Air Act*

Commenced means, with respect to the definition of "new source," that an owner or operator has undertaken a continuous program of construction or modification or entered into a contractual obligation to do so.

Construction means fabrication, erection, or installment of a regulated facility.

Modification means any physical change in, or change in the method of operation of, an existing facility that increases the amount of any regulated air pollutant emitted into the atmosphere by that facility, or which leads to the emission of a new pollutant from that facility.

Owner or operator means any person who owns, leases, operates, controls, or supervises a stationary source.

Stationary source means any building, structure, facility, or installation that emits or may emit any air pollutant.

Source: *Clean Air Act Regulations, 40 CFR 60.2. Part 60: Standards of Performance for New Stationary Sources. Subpart A: General Provisions.

Key Terms

Clean Air Act
National Ambient Air Quality Standards
ambient standards
emissions standards
New Source Performance Standards
best available control technology

prevention of significant deterioration
nonattainment program
lowest achievable emissions rate
National Emissions Standards for Hazardous Air Pollutants

Practical Applications

1. Identify all of the air pollutants for which your company is responsible.
   a. Distinguish between the different kinds of pollutants.
   b. Determine the discharged volume in tons for each air pollutant.
   c. Determine the applicable ambient *and* emissions standards for each of these pollutants.
2. Identify the region in which your operations exist or into which they may expand.
   a. Is this a PSD region? If so, obtain all preconstruction permits and demonstrate compliance with the BACT standard.
   b. Is this a nonattainment region? If so, demonstrate an effective offset has taken place within that region, and demonstrate compliance with the LAER standard.
3. Identify the types of air pollution emitters for which your company is responsible.
   a. New facilities must comply with the NSPS.
   b. Modifying a facility might trigger the need for large-scale upgrades in pollution control technology.
4. Limit the air pollutants generated by company operations.
   a. Modify product ingredients or production practices to reduce the toxicity *and* volume of air pollutants emitted by company operations.
   b. Install pollution control technology that limits the toxicity *and* volume of air pollutants emitted by your factories.
   c. Reduce hazardous air pollutant emissions through product or process innovation.

CHAPTER 7

Operations Management and Industrial Waste

History

What happens when products, packaging, and production waste materials are discarded? In the 1900s–1950s, municipal waste was collected and stored in open dumps. Open dumps were uncovered, unlined collection sites where garbage would sit and decompose. Over time, garbage dumps generate leachate, which is a liquid form of decomposing waste. Without adequate synthetic liners beneath the dumps, leachate could soak into surrounding soils and groundwater.[1] A trend for cities and towns across the country dealing with insufficient waste management capacity was literally to set the garbage on fire. The open-air burning of trash has obvious environmental and public health impacts. To address the nation's growing mounds of solid waste and the environmental and public health impacts associated with open dump and open-air burning disposal practices, Congress passed the Solid Waste Disposal Act in 1965, which was originally part of the Clean Air Act amendments discussed above. (Not all pollution stays in one environmental medium: solid waste is a land contaminant, but if burned, it becomes an air pollutant). This law required the responsible disposal of household, municipal, commercial, and industrial waste, and helped the nation transition from open dumps to landfills. The open dump has largely been replaced by integrated waste management systems, with now over half the trash generated in the United States finding its way into a landfill.[2] Much of the waste generated by industry, however, remained unsuitable for disposal at landfills without significant pre-disposal treatment to prevent toxic leachate. With the recently enacted Clean Air Act and Clean Water Act, some companies had begun to consolidate air and

water pollutants and dispose of the substance at landfills (so as to avoid compliance with water or air pollution regulations). The Solid Waste Disposal Act did not adequately address this loophole.

Congress addressed the problem of sending hazardous waste to landfills when it passed the *Resource Conservation and Recovery Act* (RCRA) in 1976,[3] which amended the 1965 Solid Waste Disposal Act and authorized the EPA's Land Disposal Restriction program. Members of the House of Representatives wrote a report that accompanied the passage of RCRA, finding that although air and water pollutants were strictly regulated by the Clean Air Act and Clean Water Act, respectively, those same pollutants were being disposed of on land in an unsound manner, in turn contributing to more air and water pollution.[4] By regulating solid waste disposal on land, Congress had "eliminate(d) the last remaining loophole in environmental law."[5] To be sure, the idea that this was the last remaining loophole in the law was only ever true in a very general sense. Many loopholes persist in the U.S. environmental law regime. For now, though, it is true to say that RCRA addressed a gaping hole in the regulation of industrial pollutants by regulating land disposal of hazardous wastes.

Scope and Applications

As the comprehensive national law on waste disposal, RCRA includes provisions for energy conservation, the conservation of natural resources, waste source reduction, recycling, and the environmentally sound management of *solid waste*. "Solid waste" is defined broadly as "garbage, refuse, sludge from a waste treatment plant, … and other discarded materials including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations."[6] Despite this broad applicability over waste management practices across industries, RCRA is most relevant to industry owing to its provisions for the management of hazardous waste.

Land Disposal Restrictions

Hazardous waste is subject to different, more stringent regulations than solid waste, including the Land Disposal Restrictions for hazardous waste destined

for a landfill. Under the *Land Disposal Restrictions* program, "hazardous waste must undergo treatment that will destroy or immobilize its hazardous components"; the program requires a company that generates waste to either "treat that waste itself, or send it to a special facility for treatment, before sending the waste to a landfill."[7] RCRA Subtitle C flatly prohibits the disposal of hazardous wastes in landfills[8] or in deep underground injection wells[9] unless the waste has been pretreated to remove its hazardous characteristics.[10]

Cradle-to-Grave Manifests for Hazardous Waste

Subtitle C of the law also creates a "cradle-to-grave" recordkeeping and compliance program (known as a *manifest* system) for the generation, transport, treatment, storage, and disposal of hazardous waste. Each generator must prepare a Uniform Hazardous Waste Manifest whenever it transports any hazardous waste off-site. The manifest accompanies the waste through its life cycle and contains information and instructions on the characteristics of that waste. Thereby a paper-trail of responsibility accompanies hazardous waste, with a copy of the manifest remaining in the possession of everyone that handled it.[11] In addition to the manifest system, RCRA Subtitle C cradle-to-grave requirements include those for:

- the generation of hazardous waste at its point of origin;
- the transportation from the point of origin to treatment facilities;
- the methods used by treatment to remove hazardous characteristics;
- the storage of hazardous waste and by-products created by its treatment; and
- the ultimate disposal of hazardous waste at an authorized receiving location.

Separate rules exist for those that generate and transport hazardous waste[12] versus those that own or operate treatment, storage, or disposal facilities.[13]

Defining "Hazardous" Under RCRA

Clearly, compliance with RCRA Subtitle C creates compliance costs for any company that manages any aspect of the life cycle of hazardous waste.

The million-dollar question then becomes, what makes commercial and industrial waste *hazardous* (as opposed to just good old fashioned regular solid waste)? *Hazardous waste* is as any waste that because of its quality, concentration, or physical, chemical, or infectious characteristics, may "(A) cause, or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed."[14]

In general, solid waste is categorized as hazardous when it has hazardous characteristics.[15] Hazardous waste possesses one or more of the following characteristics: ignitable (can cause fires under certain conditions),[16] corrosive (acids or bases that can corrode metal containers),[17] reactive (unstable under normal conditions, liable to explode, cause a violent reaction, or generate toxic fumes),[18] or toxic (harmful or fatal when ingested or absorbed by a person).[19] To reduce compliance costs, companies can innovate production methods to eliminate these characteristics from product or process waste streams.

Because the regulatory requirements for waste management are so much less stringent for nonhazardous wastes, "RCRA creates considerable incentives on the part of generators and transporters of waste, as well as (owners and operators of treatment, storage, and disposal) facilities, to structure their operations so as not to fall within the ambit of Subtitle C."[20] Technically, the stringent hazardous waste requirements of RCRA act as a deterrent: if you generate awful waste products, you're going to pay to make them not so awful before they get released into the environment. In this way, RCRA has the policy effect of reducing the volume of hazardous waste generated by private sector activities.

Recycling Nonhazardous Solid Waste

RCRA also creates incentives to reduce the amount of nonhazardous solid waste in general by establishing a carve-out for bona fide recycling programs. Recall, RCRA applies only to "solid waste." That limitation creates an escape hatch for those seeking to avoid RCRA compliance costs by avoiding disposal—through diverting material from the waste stream. Although "a solid waste is any discarded material,"[21] "materials are not

solid waste when (they are) recycled."[22] This may appear circular, but it is not: a solid waste is a discarded material, but a material is not a solid waste if it is recycled instead of discarded. *Recycled* means that a material is "used or reused as ingredients in an industrial process to make a product"(;) "used or reused as effective substitutes for commercial products"[;] or "returned as a substitute for feedstock materials" for the original process from which they were generated.[23] Recycling solid waste has the effect of closing the material loop, conserving natural resources, and reducing solid waste, and deserves to be encouraged accordingly.

Hazardous Waste Exemption for Oil and Gas Exploration and Production

Recall the History subsection of this chapter, where the House of Representatives claimed that RCRA closed the last loophole in environmental law. This claim is belied by regulations administered by the EPA that have created loopholes within RCRA itself. A *loophole* is a means by which a regulated entity can avoid complying with a law without violating the law per se. Despite the elaborate characteristics-based test for whether or not a waste is hazardous, the EPA added "drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas or geothermal energy" to the list of nonhazardous waste.[24] That means, regardless of how corrosive, toxic, reactive, or ignitable waste from oil and gas exploration and production ("E & P") might be, the EPA has simply defined E & P waste as "nonhazardous." This exemption of the oil and gas industry from Subtitle C compliance has earned the moniker the "Halliburton Loophole," as it was ushered through Congress by then-Vice President Dick Cheney, former CEO of E & P provider Halliburton Energy Services.[25]

Business Ramifications

In order to assist with the enforcement of the provisions of RCRA Subtitle C, the law creates a citizens' cause of action, which enables a citizen of the United States to bring a lawsuit in federal court against any violation of the Act that creates an imminent and substantial endangerment to public health or the environment.[26]

EPA enforcement actions under RCRA Subtitle C involving Wal-Mart, Air Products, and TRW VSSI are discussed in this section. Collectively, these violations relate to all aspects of the EPA's cradle-to-grave regulatory regime for hazardous waste: generation, transport, treatment, storage, and disposal.

Wal-Mart Stores, Inc.: Subtitle C Violations at Retail Stores across the United States

In May 2013, the EPA announced that Wal-Mart pled guilty to federal environmental crimes and civil violations, and agreed to pay more than $81 million in penalties for violations of both the Clean Water Act and RCRA.[27] The EPA and the Federal Bureau of Investigation (FBI) handled the case jointly. Pleading guilty to six misdemeanor counts of negligent violations of federal environmental law, Wal-Mart did not have a program in place, nor did it train employees, to properly manage hazardous waste at the store level. Without corporate guidance, employees (presumably in the Automotive and Home and Garden sections of retail locations) failed to comply with RCRA Subtitle C requirements for disposal of hazardous waste such as used car batteries, pesticides, and the like. The practice was to either discard solid hazardous waste in municipal trash bins or to pour liquid hazardous waste into the local sewer system. The company also shipped hazardous waste, without proper storage containers, on common Wal-Mart delivery trucks, without manifest safety documentation, to standard product return centers located across the United States.

Community service projects will be the beneficiary of $20 million from the settlement amount, and $6 million will go toward opening a Retail Compliance Assistance Center to educate retail locations throughout the United States on the proper handling of hazardous waste. According to a U.S. Attorney involved in the case, "As one of the largest retailers in the United States, Wal-Mart is responsible not only for the stock on its shelves, but also for the significant amount of hazardous materials that result from damaged products returned by customers. With its guilty plea today, Wal-Mart is in a position to be an industry leader by ensuring that not only Wal-Mart, but all retail stores properly handle their waste."

According to an Assistant Attorney General for the Justice Department's Environment and Natural Resources Division, "Wal-Mart put the public and the environment at risk and gained an unfair economic advantage over other companies." The criminal penalty amount of $40 million is meant as a deterrent for future environmental crimes, a form of disgorging the company from illicit gains, and a mechanism to fund environmental works projects in communities affected by the illegal disposal of hazardous waste into the surrounding environs.

Air Products, L.P.: Generation and Disposal Violations in Texas

In November 2010, Air Products, L.P. was assessed a $1.35 million penalty for the disposal of PCBs, a hazardous waste, at unauthorized facilities, and for failing to notify the EPA of activities related to the generation and management of this waste. The estimated compliance cost for this case was $60 million.

TRW VSSI Inc.: Storage Facility and Transport Violations in Arizona

In March 2001, the EPA referred a case against TRW VSSI, Inc.'s Vehicle Safety Systems air bag manufacturing plant and waste management facility to the Department of Justice for multiple violations of RCRA Subtitle C. One of the by-products from the manufacturing process was sodium azide, a hazardous waste. This hazardous waste was stored in over two dozen substandard tanks and surface impoundments without proper pretreatment, without a permit, and in violation of Land Disposal Restrictions. The company also violated transportation requirements by failing to properly prepare manifest documents to accompany shipments of this hazardous waste to off-site treatment facilities. The total federal penalty assessed was $5.67 million and the estimated cost for compliance actions was $12 million. Once again, the compliance cost estimate exceeded the noncompliance penalty, which might explain how the noncompliance came about in the first place. The remedy requested also included environmental remediation at the storage sites to remove the hazardous waste from the soils surrounding the improper storage tanks and impoundment ponds.

Key Definitions Under the Resource Conservation and Recovery Act

This section defines the key terms of RCRA applicable to owners or operators of facilities that generate, transport, treat, store, or dispose of hazardous waste.*

Generator is any person, or site, whose processes and actions create hazardous waste.

Transporter means any individual or entity that moves hazardous waste from one site to another by highway, rail, water or air, including movement to a storage, treatment, disposal, or recycling location.

Treatment means any method, technique, or process designed to neutralize the waste, or to recover energy or material resources from it, or to render it nonhazardous, less hazardous, safer or amenable to recovery or storage, or reduced in volume.

Storage means holding of hazardous waste for a temporary period, at the end of which it will be treated, disposed, or stored elsewhere.

Disposal means any act as a result of which hazardous waste is released into the air, water, or land.

Source: * 40 CFR 260.10.

Key Terms

Resource Conservation and Recovery Act
solid waste
land disposal restrictions
manifest
hazardous waste
recycled
loophole

Practical Applications

1. Identify the extent of solid waste generation at your company.
   a. What are the sources of solid waste?
   b. What is the approximate volume of solid waste generated?

2. Reduce the volume of solid waste generated by your company.
   a. Modify production practices to reduce waste by-products, scrap material, and the like.
   b. Recycle and reuse what would otherwise be waste material.
3. Reduce the volume and danger of hazardous waste generated by your company.
   a. Limit the volume of hazardous waste in order to reduce transport, treatment, and disposal costs.
   b. Treat solid waste to reduce or eliminate its hazardous characteristics (toxicity, corrosiveness, etc.).
4. Comply with all manifesting requirements for the generation, transport, treatment, storage, and disposal of hazardous waste.
   a. Strictly track the life cycle of hazardous waste from cradle-to-grave to ensure responsible management of this waste.
   b. Ensure that all entities involved with your company's hazardous waste management are at least in compliance with RCRA Subtitle C regulations.

CHAPTER 8

Operations Management and Workplace Health and Safety

History

With the rise of industrialization in the late nineteenth century, immigrant laborers seeking a new life in the United States flocked to urban centers in pursuit of economic opportunity. Working conditions for manufacturing and processing plant laborers at this time were poor to say the least. In 1877, Massachusetts passed the nation's first safety and health legislation, imposing safety standards on only the most serious injury-prone aspects of factory operations: exposed belts, shafts and gears, elevators, and fire exits. The trend in state protections of laborers continued with nine states requiring inspections of factories, 13 states requiring guard equipment for machinery, and 21 states providing in some way for health hazards such as toxic exposure by the year 1890.[1]

The first federal agency in charge of occupational safety, the U.S. Bureau of Labor, began publishing "graphically detailed studies of occupational fatalities and illnesses" experienced by laborers in various industry trades in 1903.[2] In 1906, Upton Sinclair published *The Jungle*, a novel documenting the plight of immigrant laborers in the United States in terms of wage slavery, harsh living and working conditions, the absence of support from government social programs, the corruption of decision-makers, and (what caught the most public attention) the dangerous working conditions in the meatpacking industry at the time. After publication, controversy over meatpacking stirred Congress to introduce the Meat Inspection Act and the Pure Food and Drug Act of 1906 (which would ultimately become the U.S. Food and Drug Administration). Neither of

these laws addressed occupational safety, but rather, food quality. This prompted Sinclair to spurn these laws, lamenting, "I aimed at the public's heart, and by accident I hit it in the stomach."[3]

Congress finally passed a law establishing the Department of Labor in 1913 in the midnight hour of Taft's term as President.[4] The Bureau of Labor Standards, the first permanent federal agency responsible for occupational safety and health standards, was established in 1934 to ensure that workplaces were "as safe as science and law can make them."[5] The reality was always far from this lofty ideal as the agency primarily worked to assist state governments with this task.

Similar to the trend in the Chapters on Water Pollution, Air Pollution, and Land Pollution, what began as a primarily state-enforced program for public protections was ultimately supplanted by federal authority to bring about meaningful risk abatement. The *Occupational Safety and Health Act* of 1970 (OSH Act) was based on a century of trial projects and compromises between government, industry, and organized labor over how best to "mitigate the vulnerabilities of employees exposed to hazards of the industrial age."[6] Although labor standards had improved from the 1870s to the 1970s, working conditions in factories were still replete with risks of bodily injury or sickness at the time the OSH Act came into existence. In 1970, "approximately 14,000 occupational fatalities were being reported each year as well as 2.5 million job-related disabilities and 300,000 new cases of job-related illnesses."[7]

Scope and Applications

The OSH Act created the Occupational Safety and Health Administration (OSHA) within the Department of Labor.[8] Pursuant to the 1970 statute, OSHA's role is to assure safe and healthful conditions for working men and women by enforcing occupational health and safety standards and providing research, information, education, and training.[9] Standards developed by OSHA are either horizontal or vertical. *Horizontal standards* apply across multiple industries in scope, whereas *vertical standards* apply to a particular industry or operation, practice, condition, process, method, equipment, or installation.[10] This section focuses on horizontal standards because they are general in nature, which will prevent the discussion from getting bogged

down in industry-specific technical nuance. In the next two sections, we summarize the most relevant regulations for the most common workplace health and safety issues.

The top-ten most frequently *accessed* General Industry Standards promulgated by OSHA address protocols for situations involving the following ten risks to employees. In this case, "accessed" means that practitioners frequently look into these legal provisions on OSHA's website. The subsequent section looks at the most frequently "cited" provisions, which means discoveries of OSHA violations frequently occur under these provisions.

Top-Ten Most Frequently Accessed General Industry Standards

1. *Bloodborne Pathogens*:[11] These standards protect employees at hospitals, diagnostic labs, and other places of work where there is a risk of exposure to "pathogenic microorganisms that are present in human blood and can cause disease in humans" (such as hepatitis B or HIV).[12] The standards include preparing an Exposure Control Plan[13] reflecting new or modified practices affecting occupational exposure as well as commercially available and effective technology to reduce or eliminate exposure.
2. *Hazard Communication*:[14] These standards require companies that manufacture or import chemicals to classify the attendant hazards of those chemicals; requires distributors of these chemicals to transmit this information to receiving companies; and requires all employers to inform employees about those hazards through effective communication, labels, warnings, safety data sheets, and training.[15]
3. *Respiratory Protection*:[16] These standards seek to protect indoor air quality from atmospheric contamination and prevent employee illnesses caused by inhaling harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors. The regulation requires companies to adopt accepted engineering control measures (such as enclosure, ventilation, and toxic material substitution). Only if engineering controls are not feasible, or while they are being implemented, may companies use respirators (breathing masks for employees that do not allow pass-through of harmful air pollutants).[17]

4. *Occupational Noise Exposure*:[18] These standards protect employees against the effects of noise exposure, and are required when noise levels exceed certain thresholds in terms of time-weighted average decibel levels.[19] When employees are exposed to sound in excess of the regulatory thresholds, the company must adopt feasible administrative or engineering controls to reduce sound levels. If reducing the sound level is not feasible through engineering controls, then the company must provide personal protective equipment (such as noise-canceling ear covers).[20] If employees are subject noise in excess of an 8-hour time-weighted average sound level of 85 decibels, the company must implement a Hearing Conservation Program.[21]
5. *Powered Industrial Trucks*:[22] These standards apply to fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines—basically, the kind of trucks used to move heavy objects around a work site or inside a storage facility (but not bulldozers or 18-wheelers).[23] They provide for the safety of industrial truck fire protection, design, maintenance, and use. Operators must obtain the prior written approval from the truck manufacturer before modifying trucks in a way that affects capacity or safe operations.[24]
6. *Permit-Required Confined Spaces*:[25] These standards apply to certain confined spaces, which are large enough for an employee to enter and perform assigned work, but which have limited or restricted means for entry or exit (e.g., tanks, vessels, silos, storage bins, hoppers, vaults, and pits).[26] Assigning employees to work in a confined space requires a permit if it contains health or safety risks from hazardous air pollutants, engulfing liquids, or the potential to trap or asphyxiate the employee.[27] Permits for working in such confined spaces must provide for hazard communication, restrictions on entry, nonentry rescue and retrieval systems, and an authorized supervisor.
7. *Lockout and Tagout*:[28] This standard establishes minimum performance requirements for the control of hazardous energy, such as accidentally powering on a cutting machine while it is being repaired.[29] It does not apply to machines that can be unplugged to remove the risk.[30] The standard covers the servicing and maintenance of machines and equipment in which the unexpected start-up or release

of stored energy could harm employees.[31] The performance standards are intended to protect employees that must insert body parts into machines at the point of operation (e.g., cutting, pressing) or an associated danger zone resulting from the machine operating process (e.g., an active gear box).[32] Work performed on machines in these situations require an energy isolating device (a mechanical device such as a circuit breaker that physically prevents the transmission or release of energy to the machine), a lockout device (a physical device such as a combination lock that holds the energy isolating device in position and prevents the machine from being operated until it is removed), and a tagout device (a prominent warning mechanism such as an orange tag attached to the lockout device that indicates the machine cannot be operated until it is removed).[33]

8. *Hazardous Waste Operations and Emergency Response*:[34] These standards protect employees assigned to clean-up operations, work at Treatment, Storage, and Disposal facilities (as defined by RCRA), and during emergency operations, involving hazardous waste.[35] Employers must prepare a site-specific safety and health program for hazardous waste operations including medical surveillance and standard operating procedures[36] as well as a comprehensive workplan including logistics and resources available for clean-up, and implementation procedures for site control and decontamination.[37] The standard also specifies required personal protective equipment.[38]
9. *Guarding Floor and Wall Openings and Holes*:[39] This standard specifies the type of guarding installations necessary for safe floors and work-ways with dangerous openings, including stairwells, ladders, hatchways, chutes, hinged floor openings, skylights, pits, trapdoors, and manholes.[40] The requirements for standard railings and toe boards differ depending on the height of the potential fall.[41]
10. *Personal Protective Equipment*:[42] This standard requires the provision, use, and maintenance in a sanitary and reliable condition for personal protective equipment any time an employee is potentially exposed to virtually any hazard to any part of the body.[43] Even if employees provide their own personal protective equipment, employers are responsible for assuring its adequacy.[44] Employers must provide proper training on the use of personal protective equipment, including

when it is necessary to use, which type of equipment is necessary, how to properly don, doff, adjust, and wear it, its limitations as a protective device, and how to maintain and dispose of it after use.[45]

While corporate compliance officers frequently access these ten regulatory provisions, they are not the same as those that cause the most trouble to companies. The top-ten most frequently *cited* standards (meaning a company was cited by OSHA inspectors for noncompliance) cover the following areas.

Top-Ten Most Frequently Cited General Industry Standards

1. *Fall Protection*:[46] This standard prevents employees from working or walking on surfaces six feet or more above the lower level without adequate surface strength and structural integrity.[47] In situations where the risk of a fall from a walkway, scaffolding, or ramp exists, employers must install a system of guardrails, safety nets, or personal fall arrest devices,[48] and in the case of excavation, the employer must install fences or barricades.[49]
2. *Hazard Communication*. Top-ten most accessed General Industry Standard.
3. *Scaffolding*:[50] This standard provides detailed requirements for elevated and suspended walkways and work spaces for construction-related projects. Scaffolds must be able to support at least four times,[51] and suspension ropes must be able to support at least six times, the intended load.[52] Scaffolding platforms and walkways must be at least 18 inches wide[53] and the front edge of platforms must not be farther than 14 inches away from the workface unless a guardrail or personal fall arrest system is used.[54]
4. *Respiratory Protection*. Top-ten most accessed General Industry Standard.
5. *Electrical Wiring Methods*:[55] These standards provide for safety of live electrical wires that could electrocute employees. Grounding conductors must be bonded to ensure electrical continuity and the ability to safely conduct any fault current likely to be imposed on them.[56] The same standards apply to temporary wiring, with the exception,

of course, for Christmas lights.[57] All lamps for illumination must be protected from accidental contact or breakage.[58] Flexible cords and cables must be protected from accidental damage as might be caused by sharp corners or pinch points.[59]

6. *Powered Industrial Trucks*. Top-ten most accessed General Industry Standard.
7. *Ladders*:[60] Self-supporting portable ladders must be able to support at least four times the maximum intended load.[61] All steps and ladder rungs must be parallel, level, and uniformly spaced when the ladder is in position for use.[62] The rungs and steps of portable metal ladders must be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.[63] Ladders cannot be tied or fastened together to provide longer sections unless they are specifically designed for such use.[64] Ladders with a climb length greater than 24 feet must be guarded by cages, wells, ladder safety devices, or self-retracting lifelines.[65]
8. *Lockout and Tagout*. Top-ten most accessed General Industry Standard.
9. *Electrical General Requirements*:[66] This standard protects employees from hazards of death or serious physical injury from electric equipment.[67] Among other features, the determination that electrical equipment is safe is based on one or more of the following factors: mechanical strength and durability,[68] electrical insulation,[69] heating effects under all conditions of use,[70] and arcing effects.[71] Installation[72] and use of electrical equipment must follow manufacturer's instructions and all wiring must be free from short circuits.[73] Unless a conductor or electrical equipment was designed specifically for these operating environments, they are prohibited for use in damp or wet locations; where exposed to gases, fumes, vapors, liquids, or other agents that have a deteriorating effect on the conductors or equipment; or where exposed to excessive temperatures.[74]
10. *Machine Guarding*:[75] Guarding methods such as barriers, tripping devices, and electronic safety devices are required on machines that present hazards to employees from point of operation, ingoing nip points, rotating parts, flying chips, or sparks.[76] Guards on machines must be securely affixed and may not present an independent risk of hazardous accident in itself.[77] The point of operation of machines (where work is

> actually performed upon the material being processed) whose operation exposes an employee to injury must be guarded in such a way as to prevent the operator from having any part of his body in the danger zone during the operating cycle.[78] Special hand tools for placing and removing material must permit easy handling of material without the operator placing a hand in the danger zone, but hand-tools are only a supplement to, but not a replacement of, adequate machine guarding.[79]

Only four of the top-ten most frequently *accessed* code provisions (hazard communication, respiratory protection, powered industrial trucks lockout and tagout) are on the list of the top-ten most *cited* code provisions. This suggests a substantial disconnect between the areas of concern to corporate OSHA-compliance personnel and the areas of operations that generate the largest number of violations.

Severe Violator Enforcement Program

Given such a wide scope of responsibilities and limited inspection resources, OSHA has always been on the back foot in dealing with the nation's occupational risks. In order to strategically increase effectiveness given a vast regulated community and limited enforcement capabilities, the current OSHA agenda is to take action against the worst of the worst, while collaborating and assisting everyone else (rather than policing everyone at once). According to the current *Severe Violator Enforcement Program* (SVEP), OSHA inspection and enforcement resources are concentrated on employers with a "demonstrated recalcitrance or indifference to their OSH Act obligations by committing willful, repeated, or failure-to-abate violations" in one or more of the following circumstances: fatal or catastrophic situations, industries or operations posing severe occupational hazards, industries that expose employees to hazardous chemicals, or employers with a broad pattern of noncompliance.[80]

Whistleblower Protections

Essential to the core mission of OSHA are protections for *whistleblowers.*[81] Section 11(c) of the OSH Act prohibits employers from retaliating

against employees in any manner for exercising their rights under the law. Employee's rights under the OSH Act that assist OSHA compliance efforts are complaining to OSHA and seeking an OSHA inspection; participating in an OSHA inspection; and participating or testifying in any proceeding related to an OSHA inspection. In 2010, OSHA completed 1,177 investigations flowing from 11(c) employee whistleblower complaints.[82] When violations of OSHA result from willful employer conduct and cause an employee death, or when they involve obstruction of justice or fraud related to OSHA investigations, the agency refers the case to the Department of Justice for prosecution.[83]

Business Ramifications

The statistics in this section are based on queries of the U.S. Department of Labor Data Enforcement page, which compiles information on, among other things, OSHA investigations.[84] Between 2010 and 2013, there have been:

- 71,476 health and safety complaints;
- 1,245 willful violations of health and safety regulations;
- 177,913 serious violations of health and safety regulations;
- 13,049 repeated violations of health and safety regulations;
- 3,248 fatalities from workplace injury;
- 3,984 injuries requiring hospitalization; and
- 88 fatalities resulting from willful violations of OSHA regulations.

Since 2010, OSHA has closed nine enforcement cases against companies including BP Products North America, Southern Scrap Material, Arcadian Corporation, and Imperial Sugar Company for willful violations of OSHA regulations that exposed more than 10 employees to workplace hazards and which resulted in fines greater than $1 million.[85]

Serious violations of OSHA standards carry a minimum $5,000 and maximum $70,000 violation. *Failure-to-abate* violations carry a mandatory $7,000 fine per day. *Repeated* violations carry a minimum penalty of $5,000 and a maximum of $70,000. *Willful* violations of OSHA

standards carry a minimum $5000 fine with a maximum of $70,000 fine. A willful violation that causes a fatality is punishable by court-imposed fine, six months imprisonment, or both, with criminal penalties reaching a maximum of $250,000 for an individual and $500,000 for a corporation. See the *Key Definitions* section at the end of this chapter for more about the differences between these types of violations.

BP Products North America Oil Refinery Explosion

In September 2005, the BP Products North America oil refinery in Texas City, Texas experienced a catastrophic explosion from an ignited hydrocarbon vapor cloud that killed 15 and injured 170 employees, resulting in an initial penalty of $21.36 million for 18 serious and 300 willful violations of OSHA standards.[86] As investigations continued, in September 2009, OSHA issued an additional $87.43 million penalty for 31 serious, 609 willful, and 78 repeat violations of OSHA standards.[87] In August of 2010, BP Products North America paid an additional $50.6 million for failure-to-abate violations at this facility. In July 2012, it paid an additional $13 million and agreed to abate process safety management violations.[88]

Imperial Sugar Co. Sugar Refinery Explosion

In July 2008, an industrial disaster occurred at a cane sugar refinery owned by Imperial Sugar Co. near Savannah, Georgia. OSHA fined the company $8.78 million for 63 serious violations and 84 willful violations resulting in the death of 14 employees and the injury of 38 others.[89] The massive accumulations of combustible sugar dust throughout the facility caused an explosion and fire.

O & G Industries and Keystone Construction & Maintenance Power Plant Explosion

The February 7, 2010, explosion at Kleen Energy Systems Natural Gas Power Plant resulted in $16.6 million in penalties. OSHA cited three construction companies and 14 subcontractors for 371 safety violations, including: $8.3 million to O & G Industries, for 16 serious and 117 willful

violations;[90] and $6.6 million to Keystone Construction & Maintenance, for 8 serious and 94 willful violations.[91]

Key Definitions from the Occupational Safety and Health Act

Serious violation means there is a substantial probability that death or serious physical harm cold result from conditions in the place of employment, unless the employer did not know (and could not have known with the exercise of reasonable diligence) about it.*

Other-than-serious violation means a situation that could cause, at worst, physical injury that is neither fatal nor serious, but which is directly related to employee safety.†

Failure to abate violation means the time period for resolving a dangerous situation has passed and the company still has not taken corrective actions required by the citation.‡

Repeated violation means the employer has been cited for a dangerous situation that is substantially similar to a prior violation.**

Willful violation means the employer demonstrated an intentional disregard for the requirements of the OSH Act, or demonstrated plain indifference to employee health and safety.†† It is not necessary that the violation be committed with a bad purpose or malicious intent to be deemed "willful." It is sufficient that the violation was deliberate, voluntary or intentional (as distinguished from inadvertent, accidental or ordinarily negligent).‡‡

Source: *Occupational Safety and Health Administration, OSHA's Field Operations Manual (FOM) (April, 2011), pp. 4–8.

†*Occup*ational Safety and Health Administration, OSHA's Field Operations Manual (FOM) (April, 2011), pp. 4–28.

‡*Occup*ational Safety and Health Administration, OSHA's Field Operations Manual (FOM) (April, 2011), pp. 4–34.

***Occu*pational Safety and Health Administration, OSHA's Field Operations Manual (FOM) (April, 2011), pp. 4–32.

††*Occu*pational Safety and Health Administration, OSHA's Field Operations Manual (FOM) (April, 2011), pp. 4–28.

‡‡*Occu*pational Safety and Health Administration, OSHA's Field Operations Manual (FOM) (April, 2011), pp. 4–30.

Key Terms

Occupational Safety and Health Act
horizontal versus vertical standards
Most Frequently Accessed/Cited General Industry Standards
Severe Violator Enforcement Program
whistleblower protections

Practical Applications

1. Determine the adequacy of employee health and safety protocols.
   a. Identify the number of employee health and safety violations that take place each year, distinguishing between nonserious, serious, and willful violations. Compare this number with peer companies in your industry to see whether attaining superior numbers is possible.
   b. Interview managers and employees to gather ground-level information on the adequacy of workplace health and safety measures.
2. Understand the risk factors of employee health and safety management.
   a. Assess the monetary impact of OSHA violations to your company's profitability, in terms of legal fines, worker productivity, employee retention, and worker's compensation claims.
   b. Assess the intangible impact of OSHA violations to your company's overall strength in terms of reputation and social license to operate.
   c. Compare the risks created by OSHA violations to the benefits, in terms of avoided compliance costs. If properly assessed, chances are that the risks actually outweigh the benefits of noncompliance.
3. Determine the cultural barriers to improved employee health and safety performance.
   a. Tally the willful violations of health and safety regulations that occur each year, and compare them to competitors' willful violations, controlling for company size.
   b. Determine the underlying causes of willful violations of employee health and safety laws. For instance, are these willful violations done to avoid compliance costs, increase productivity, save time, or some other reason?

c. Identify the barriers to improved employee health and safety, and take proactive measures to eliminate these obstacles. Consider the adverse effects of managerial and employee incentives, the expectations established by training protocols, and the adequacy of resources dedicated to correcting workplace health and safety problems.

PART IV

Legal Compliance and Marketing Sustainability

So far we have covered the major legal frameworks affecting sustainability in the areas of supply chain management and operations. Now we proceed to sustainability issues related to marketing.

Marketing is defined as the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging product and service offerings that have value for customers, clients, partners, and society at large.[1] On the one hand, marketing involves the invention of consumer demand in the form of persuading customers that your company's products or services are beneficial. On the other hand, marketing involves satisfying consumer demand for specific goods and services, which exists regardless of available supply. These aspects of effective marketing apply to traditional as well as sustainable companies. However, marketing sustainable performance involves a host of considerations not typically addressed in marketing strategy. In general, *marketing sustainability* means addressing the social, economic, and environmental attributes of your products or services in a way that creates consumer demand for sustainable consumption and satisfies consumer demand for responsible, quality products, and services.[2]

A variety of laws and regulatory guidance exist to protect reasonable consumer expectations when it comes to marketing products or services that boast environmentally or morally superior attributes. Principles and practices of sustainability cut across functional areas of business. Claims that a product is environmentally superior must be backed up by information about the manufacturing and production process. Claims that a product was made using responsible sourcing must be supported with information about that product's supply chain labor practices. Here,

perhaps more than anywhere else, it pays for employees of the various divisions of a company to be in communication with one another. The actual physical and logistical life cycle of a product must be consistent with marketing communications about that product.

CHAPTER 9

Truth-in-Advertising and Sustainable Product Design

All companies, whether or not they are pursuing sustainable strategy, must be fair and truthful when marketing products and services, consistent with the rules governing advertisements set forth by the U.S. Federal Trade Commission (FTC). Specifically, it is unlawful for a business to use unfair, deceptive, or false statements in an advertisement for the purpose of encouraging consumers to buy products and services.[3]

What does it mean to say an advertisement is *deceptive*? According to the FTC's *Deception Policy Statement,* an ad is deceptive if it contains (or omits) information that is likely to *mislead* consumers acting reasonably under the circumstances, and it is *material* in the sense that the deceptive information is important to a consumer's decision to buy or use the product or service.[4]

What does it mean to say an advertisement is *unfair*? According to the FTC's *Unfairness Policy Statement*, marketing is unfair if it is likely to cause substantial consumer injury that a consumer could not reasonably avoid, and the risk of injury is not outweighed by the benefit of that marketing to consumers.[5]

How do the rules of fairness and truthfulness apply to companies eager to market their sustainability initiatives? Let's look at the story of S.C. Johnson & Son, Inc. for an example of the impacts of truth-in-advertising rules on sustainability marketing.

S.C. Johnson & Son, Inc. and the Greenlist™ Lawsuit

S.C. Johnson & Son, Inc., manufactures household cleaning products including the popular brand Windex® for cleaning glass surfaces. The company's sustainability initiative began in earnest in 2001 with its

patented Greenlist™ process, which classifies potential product ingredients based on impacts to the environment and human health.

According to S.C. Johnson & Son, Inc. "Our goal … is that beyond meeting legal and regulatory requirements for our products, we also increase year-on-year the percentage of our ingredients that has the least impact on the environment and human health. Through our Greenlist™ process, each potential ingredient receives a rating from 3 to 0. An ingredient with a 3 rating is considered 'Best,' 2 is 'Better,' 1 is 'Acceptable' and 0-rated materials are used only on a limited, approved basis when there is not a viable alternative. Whenever possible, we work toward replacing these 0-rated materials with those that have a preferable environmental or health profile. This diligence helps us go beyond regulatory requirements to continually make our products better. While some raw materials with a 0 score are not restricted by government regulatory requirements, over the years SC Johnson has decided to limit their use."[6]

The Greenlist™ process is a positive example of the business benefits of sustainability: not only S.C. Johnson & Son, Inc. able to more than double its use of environmentally superior product ingredients companywide, it also reduced 1.8 million pounds of volatile organic compounds (a harmful air pollutant) from the ingredient list for Windex, their popular glass surface cleaner, while improving its cleaning power by 30 percent.[7] Sustainability initiatives can ensure compliance with law, reduce risk of harmful substances in a company's supply chain, safeguard consumer health by taking proactive measures to redesign products, and even improve product quality along the way.

However, all of these benefits from sustainable product development must be captured through appropriate marketing activities. That is where S.C. Johnson & Son, Inc. hit a roadblock. The company introduced the reformulated Windex® in 2008, and included on the bottle a green label signifying that the product had been certified by the company's in-house Greenlist™ process. The company hoped to capture a share of the emerging market for sustainable household cleaning products, and labeled the newly vetted Windex® line to signal to consumers the changes made to that product. This label led a consumer to sue the company for false advertising.

The allegation was that the company designed the Greenlist™ label to resemble a third-party verification, when in reality the determination that

the Windex® product was environmentally superior was made in-house. Additionally, the label implied that the product contained environmentally friendly ingredients, rather than simply being vetted to eliminate the most harmful ingredients. Recall that the law of truth-in-advertising requires the plaintiff to prove the advertisement was misleading and material. In this case, that would mean the Greenlist™ label would deceive a consumer acting reasonably under the circumstances into thinking it was an independent certification, and that this false impression of independent certification was an important factor in the consumer's decision to purchase that product.

The case was filed in federal trial court, and S.C. Johnson & Son, Inc. filed a motion to dismiss. The presiding judge ruled against the company, deciding that the allegations were "sufficient to create a question of fact as to whether the Greenlist™ label is deceptive."[8] That means the plaintiff was entitled to a jury trial to resolve the question of whether the Greenlist™ label was deceptive. Jury trials are expensive and rife with uncertainty as to the outcome, and present bad publicity for corporate defendants. These are some of the reasons why 98 percent of lawsuits settle before going to trial.

According to the company's CEO and chairman, Fisk Johnson, "We decided to settle for two reasons. First, while we believed we had a strong legal case, in retrospect we could have been more transparent about what the logo signified. Second, and very importantly, Greenlist™ is such a fundamentally sound and excellent process we use to green our products, that we didn't want consumers to be confused about it due to a logo on one product."[9]

This tale teaches us more than the old adage that no good deed goes unpunished. It instructs us that marketing sustainable products must be done carefully. It is not enough to label a product as "green." Marketing sustainable products requires integrity and independence in the certification process, or at least a more complete disclosure of the in-house process used to determine which products deserve to be branded as "sustainable" in comparison to traditional brands.

Federal Trade Commission *Green Guides*

The U.S. Federal Trade Commission (FTC) has published the *Green Guides* addressing marketing claims related to environmental performance,

product attributes, and the design of products marketed as environmentally friendly. The FTC's *Green Guides* are a species of truth-in-advertising guidelines that go beyond basic tort-law warranties about the safety and reliability of product performance. The guidelines are organized into distinct kinds of environmental claims one could make in the course of marketing a "green" product, and are designed to prevent misleading consumers and to ensure that environmental marketing claims are truthful and substantiated. "The Green Guides are not agency rules or regulations. Instead, they describe the types of environmental claims the FTC may or may not find deceptive."[10]

Consistent with the argument of Chapter 2, FTC green marketing guidelines represent a regulatory floor, creating a minimum threshold that companies must meet in order to advertise their sustainability efforts. FTC chairman Jon Leibowitz claimed these standards would "bring substantial change to the marketplace," while Joel Makower, executive editor of Greenbiz.com, was more reserved: "They represent a low bar that's only going to head off the worst of the worst."[11] See Table 9.1.

Consider the coffee bag. Designed to seal in the fresh oils and strong scents of roasted coffee beans, coffee bags are ubiquitous in cafés and grocery stores, and range from triple-layered plastic and foil bags used by gourmet roasters to the lightweight brown paper used by store brands. Wegman's grocery chain sells roasted coffee beans in an EcoCraft® bag that includes the universal tri-arrow recycling symbol and the EcoCraft® label. The bag clearly and prominently explains the scientific basis behind these "sustainable marketing" labels. To quote:

Advantages of Producing EcoCraft®

Natural Paper versus White Paper*

- 21 percent Reduction in Wood Pulp Used
- 30 percent Reduction in Total Energy Used
- 10 percent Reduction in Green House Gases
- 46 percent Reduction in Wastewater Produced

*Environmental impact estimates were made using the Environmental Defense Paper Calculator. For more information visit http://papercalculator.org

Table 9.1 Regulatory guidelines for advertising environmental attributes

Marketing claim	Acceptable use	Risk of deception
Carbon offsets	Based on reliable scientific evidence to support carbon offset claims, using appropriate accounting methods to avoid double-counting.	It would be misleading to imply that offsets result from sustainability initiatives when they are simply a matter of legal compliance.
Free-of	Marketers can only make a "free-of" claim for a product that does contain some amount of that substance only if (1) the product doesn't have more than trace amounts, (2) the amount of substance present doesn't cause harm, and (3) the substance wasn't added intentionally.	It would be deceptive to claim that a product is "free-of" a substance if it merely substitutes a harmful substance for one that poses a similar environmental risk.
Non-toxic	Marketers who claim that their product is "nontoxic" must base this claim on reliable scientific evidence that demonstrates the product is safe both for people and the environment.	It is misleading to label a product "nontoxic" if the manufacturing process generated toxic waste, even if the resulting product itself contained no toxic ingredients.
Recyclable	Marketers should make recycled content claims only for the actual percentage of materials that have been recovered or diverted from the waste stream associated with that product.	It would be misleading to say, "Made from recycled material" (rather than specifying the actual recycled content percentage by volume) because this could imply the entire product was made from a closed-loop process.
Made with renewable energy	Marketers should not make an unqualified "made with renewable energy" claim unless all, or virtually all, the significant manufacturing processes involved in making the product are powered with renewable energy (or matched by Renewable Energy Credits.)	It would be misleading for a company to label a product as "made with renewable energy" without prominently specifying the source (e.g., wind, solar, biomass). Partial use of renewable energy may be required by law, and is therefore not a marketable sustainability initiative.
Made with renewable materials	Marketers should qualify renewable materials claims unless an item is made entirely with renewable materials, aside for minor and incidental product components.	Marketers must avoid ambiguity from "made with renewable materials" claims by explaining how the material is renewable.
Pollution source reduction	Marketers should qualify a claim that a product or package is lower in pollution levels or toxicity clearly and prominently to avoid deception about the amount of reduction and product differentiation.	Claiming a product "generates less pollution" is ambiguous without specifying the basis for comparison (versus former or competitors' products) and the actual amount of reduction.

This label appears to comply with the FTC *Green Guides* in three salient aspects. (1) by stating the basis of comparison (when the EcoCraft® bag is compared against bleached white paper); (2) by specifying percentages of improvements (rather than unqualified claims of "less bad"); and (3) by directing consumers to the scientific foundation for these environmental attribute claims. Additionally, the EcoCraft® label avoids the risk of truth-in-advertising lawsuits faced by S.C. Johnson & Son, Inc. (discussed earlier) by relying on an independent third-party network of nonprofits, the Environmental Paper Network, to provide certification of these environmental attributes.

The guidelines for sustainability marketing laid out in the FTC *Green Guides* clearly impact marketing activities by delineating how companies can appropriately capture benefits of sustainability initiatives that go into consumer products. However, these norms should also be kept in mind during the early stages of product design.

Key Terms

marketing sustainability
truth-in-advertising
deception policy statement
deceptive and unfair
green guides
environmental attributes

Practical Applications

1. Distinguish between your company's traditional marketing efforts and your strategy for marketing sustainable performance.
   a. Which of your company's marketing efforts address the social and environmental aspects of corporate conduct?
   b. Do the sustainable marketing claims concern supply chain management practices, operations management practices, product attributes, or some combination?

   c. Are sustainability-related marketing claims backed up by quantified, independent, credible evidence? If they are not so supported, why not?
2. Ensure sustainability-related marketing efforts are accurate and relevant to actual corporate conduct.
   a. When it comes to marketing public interest issues like sustainability, honesty is the best policy. Regardless of how much your company invests in sustainability, deceptive advertising can undermine any consumer goodwill that might have been generated by these investments.
   b. Compare your company's proposed type of sustainability marketing claims with the FTC's Green Guides for that category of claim, in advance of publication, to ensure they pass scrutiny.
3. Crosscheck advertisements concerning the environmental attributes of products with nonmarketing professionals within your company.
   a. Allow interdivision review of marketing claims before they are publicized to ensure they are founded on transparent informational feedback from product design specialists within your company. The right hand must know what the left hand is doing.
   b. Balance the rhetoric of the sales pitch with the sober accuracy of engineering specifications. When it comes to prudently marketing sustainable products, facts are more important than feelings.

CHAPTER 10

Truth-in-Advertising and Sustainable Product Supply Chains

Truth-in-advertising rules apply to all marketing initiatives for all types of products and services, not just environmentally responsible ones. A unique set of rules applies specifically to marketing related to the environmental performance of product design (discussed in Chapter 9). This chapter explains the unique norms that apply to marketing related to the sustainability of a product's supply chain.

The adverse impacts of consumer product life cycles, in terms of environment and human health, are relevant factors to customers at the point of sale. Information about the supply chain impact of a product is not captured by descriptions of the final product ingredients or manufacturing methods. Even if a product is environmentally benign downstream—for instance, it is biodegradable or free of toxins—it may still be associated with social and environmental risks that occur upstream.

Greenwashing

In order to capture the benefits of sustainable performance—increased market share, price premiums, reputational benefits, and so forth—companies may be tempted to expend more effort on marketing sustainability than they dedicate to actual sustainable performance. In other words, as consumers become increasingly concerned with sustainable performance, companies may use marketing in "a coordinated attempt to hide unpleasant facts"[1] about the company, its suppliers, or the processes that went into that product—just like whitewashing over a problem, but in this context, specifically related to sustainable supply chain performance.

Greenwashing is a derogatory term used to describe the unethical practice of representing a company as more environmentally responsible than it is in fact. Coined by environmental activist Jay Westerveld, the term was originally used to criticize hotels for the practice of asking guests to 'join our effort to conserve water' by reusing towels and linens. The problem was, some hotels did not actually employ any independent water conservation efforts such as recycling gray water, but rather, the water conservation strategy depended entirely on consumers declining freshly laundered towels and linens. This type of sustainability messaging is misleading to the extent that it gives customers the false impression that the company is genuinely concerned with sustainable water policy, when in fact the company is basically profiting from customers' sacrifice of comfort and cleanliness. As growing ranks of customers are starting to exercise conscientious consumption, and as resource conservation takes on growing prominence as a genuine international concern, so does the risk of exploiting customer goodwill without making any bona fide commitment to the environmental conservation cause.

In response to the proliferation of environmental-themed marketing from companies with questionable environmental track records, the University of Oregon and EnviroMedia Social Marketing teamed up to develop the Greenwashing Index. The Greenwashing Index is a tool that empowers consumers to keep environmentally themed advertisement honest. Users can document such advertisements on an interactive online forum, and rate them on a scale from authentic to bogus.[2]

Greenwashing technically falls outside the purview of truth-in-advertising rules because these claims are not patently deceptive or unfair. The classic example of greenwashing is if, say, a fossil fuel company launches an ad campaign about their renewable energy innovations, without mentioning the fact that renewables constitute an extremely narrow portion of their overall fuel source portfolio, the majority of which is inherently environmentally degrading.[3] Although the company in this hypothetical example did not make a single false statement in the ad, still there is a hint of deception in it, because the intention of the advertisement is to create the impression of a sustainable company where there is little to show for it. Greenwashing statements are not outright deceptive on their own terms, but may become so when taken out of context—and the advertisers control the context.

According to the Greenwashing Index, there are five forms of greenwashing that conscientious consumers should watch out for[4]:

1. The advertisement misleads with words. The only thing about the company that is environmentally themed is the words used in an advertisement, which may have little to do with the company's mission, its supply chains, operations, products, or services.
2. The advertisement misleads with images. Visual cues such as nature imagery can suggest environmental responsibility where there is none.
3. The advertisement makes a claim that is vague or improvable. The advertisement lacks specific information about the environmental benefits claimed to be possessed by its products.
4. The advertisement overstates or exaggerates the company's environmental profile. The advertisement inflates the significance of the company's limited engagement with sustainability, making it appear central to the company's mission when it is a minor investment.
5. The advertisement omits important information that makes the claim sound better than it is. The advertisement diverts attention away from the real problems caused by the company's activities, or touts the environmental benefits of an initiative without mentioning its environmental costs.

These varied and subtle forms of greenwashing may not make it onto the enforcement agenda for the Federal Trade Commission, however, they can generate the risk of reputational damage. Keep in mind the social license to operate discussed in Chapter 2. Misleading customers about the environmental attributes of product supply chains can erode trust in the corporate brand. When greenwashing goes too far, the result may be worse than a few disgruntled environmentalist customers, even if it does not bring about governmental enforcement.

FIJI Water and the "Carbon Negative" Lawsuit

Perhaps, the most prominent instance of liability for greenwashing is the lawsuit faced by FIJI Water for claiming their bottled water mitigates climate change. For several years, FIJI Water, arguably the most

famous bottled water company in the world, was marred by controversy because of a label affixed to its signature square bottles: 'The World's Only CARBON NEGATIVE Bottled Water.' "[5]

The phrase "carbon negative" means the life cycle of each bottle—including production, packaging, distribution, and disposal—removes more carbon dioxide pollution from the atmosphere than it emits. This is, on its face, an implausible claim to make about anything delivered in a plastic bottle, given the fact that typical plastic bottle material polyethylene terephthalate (PET) comes from fossil fuels, and for every ton of PET produced, about three tons of carbon dioxide is emitted into the atmosphere.[6] The company was named as the defendant in a class action lawsuit, alleging that the carbon negative claim was deceptive because FIJI Water was not actually removing more carbon dioxide from the atmosphere than it was generating.

The defense to this claim came in the form of "forward crediting," where the company takes credit for reductions in carbon dioxide scheduled to take place some time between 2007 (when the campaign began) and 2037 (when the "carbon negative" commitment is finally to be met).[7] The company intends to use a tree-planting strategy to create enough of a carbon sink to cancel-out the amount of carbon dioxide emissions generated by its activities. Trees act as natural carbon capture and storage containers, as they convert carbon dioxide into oxygen and retain the carbon in the form of woody mass. As helpful as this strategy is for carbon capture, the company would need to plant millions of trees to adequately offset its greenhouse gas emissions, and it is not clear when that massive tree-planting campaign would take place. But it is not the method of carbon abatement that generated the lawsuit, but rather, the timing.

The class action lawsuit seeks restitution for the premiums paid to FIJI Water by customers who were given the impression that "carbon negative" meant real-time reductions in atmospheric carbon dioxide pollution. One of the plaintiff's attorneys put it this way: "This case is very simple: Defendants convince consumers to buy their 'FIJI' brand of bottled water—and to pay more for FIJI than for competing brands—by advertising and labeling FIJI" as carbon negative.[8] It was not clear to customers, based on public statements and advertisements from the bottler, that carbon negative would only be possible under an attenuated

forward crediting model. "We want FIJI Water to stop distorting its environmental record to push sales.… It is unconscionable for FIJI Water to charge double the price of its competitors by convincing consumers that drinking (their bottled water) helps the environment, when in reality the opposite is true."[9]

One is left wondering whether there would have been any basis for a greenwashing lawsuit if the company had simply been more forthright about when the carbon reductions were scheduled to take place. If consumers knew that "carbon negative" applied over a 30-year time horizon, rather than in real-time, there may have been no basis for litigation. Perhaps, too, however, there would have been fewer sales of FIJI Water.

This case illustrates the need for transparency, credibility, and verifiability when it comes to marketing the environmental attributes of product supply chains. One thing to notice about this case is that bottled water is controversial in its own right because of the amount of energy and materials that go into product packaging and distribution. Selling bottled water is only a few degrees less absurd than selling bottled air. For every liter of bottled water sold, at least three liters of water is consumed just in the product packaging, not to mention the total life cycle water consumption of the plastic supply chain (e.g., extracting and processing the oil or natural gas from which the plastic is derived).[10] The greenwashing lawsuit came on the heels of existing environmentalist consternation with the bottled water industry in general. It was one thing to sell a product with a net adverse impact on the environment—many companies do this with many products. But claiming such a product is good for the environment, and charging more for it because of this claim—well, that just went too far, so litigation ensued.

Nike, Inc. and the Sweatshop Lawsuit

Recall the United Nation's rubric defining human trafficking from Chapter 4. Exploitative labor practices, such as employing low-income children without meaningful remunerative alternatives on full-time shifts in an unsafe manufacturing plant without medical benefits, may very well constitute human trafficking according to that rubric. For over two decades, Nike, Inc., the global athletic apparel company, has struggled with

allegations of sweatshop labor practices at overseas suppliers. Child labor as well as harsh working conditions made up the gravamen of the complaints from U.S. consumer activists concerned with the social impact of Nike's supply chain. Naturally, Nike initiated a corporate social responsibility (CSR) campaign during the initial peak of these complaints in the 1990s, in order to publicize its role as a socially responsible employer.

One of these CSR campaign advertisements ran in the State of California, which at the time had a consumer protection law on the books that provided a cause of action for "any person acting for the interest of … the general public"[11] to sue for equitable relief against false and misleading advertisements. Activist Marc Kasky sued Nike under this law for false advertising. Basically, he argue that the company was claiming to be a socially responsible employer while still engaging in alleged sweatshop labor practices overseas.

Despite what one might expect from such a lawsuit, the case did not turn on whether Nike's labor practices overseas were socially responsible. Rather, the case turned on whether Nike's CSR campaign constituted commercial or noncommercial speech.[12] If the speech in question is commercial speech, then it is subject to strict regulation to prevent consumer deception, whereas if it is noncommercial speech, it requires a more difficult showing of intention-to-deceive to be considered unlawful. Commercial speech is expression strictly related to the economic interests of the company and its customers, whereas noncommercial speech is expression about, for instance, matters of public concern. If Nike's allegedly misleading CSR campaigns constituted commercial speech, presumably it would lose the lawsuit and be enjoined from publicizing its CSR claims any further in the State of California.

Nike's lawyers argued that the CSR campaign about socially responsible labor practices was noncommercial speech with only a tenuous relationship to customer's decision to purchase Nike products. The trial court rejected this argument, holding "when a corporation, to maintain and increase its sales and profits, makes public statements defending labor practices and working conditions at factories where its products are made, those public statements are commercial speech that may be regulated to prevent consumer deception."[13] The bases for holding that Nike's CSR campaign was commercial speech were threefold: statements of fact about

Nike's product supply chain activities are (1) intended to appeal to potential customers, (2) driven by the possibility of economic gain for Nike, and (3) play an important role in customer decisions whether to buy a Nike product.[14] In other words, if Nike was going to volunteer information about labor conditions in the production process, it had to tell the truth, and could be liable for failing to do so even if there was not an overt intention to deceive customers.

After losing at trial, Nike appealed to the California Supreme Court. Nike's attorneys argued that characterizing an advertisement as commercial speech should depend upon a distinction between products and processes.[15] To wit, commercial speech should only apply to marketing statements about *products as such* (price, availability, suitability for advertised use), whereas statements made about the *processes* by which products are created (labor practices, manufacturing pollution, supply chain impacts) should be characterized as noncommercial speech. The upshot of this distinction is that companies must strictly tell the truth only when making product claims about the price of products, whether it is available in stores, and whether it will work as intended, and that process-related claims are subject to a looser standard for veracity.

Naturally, a few advertising trade groups and the Chamber of Commerce filed papers to the California Supreme Court to support this "product and process" distinction, as it would provide greater leeway to advertisers to make bogus claims about their product supply chains without being subject to truth-in-advertising laws. Their position was that the only legitimate concern for potential customers was product price, availability, and function, rather than moral or environmental considerations about the life cycle of consumer products.[16] If that is true, it forces the question, why would advertisers volunteer process information if they also believe it is immaterial to consumers and needn't be true?

More stakeholders filed papers with the California Supreme Court, including law scholars and members of the U.S. Congress, disagreeing with Nike's position. In general, they criticized the product and process distinction as an unduly limiting framework for characterizing commercial speech, because it refused to accept "process" information as a legitimate basis of consumer preference, when more and more consumers are basing purchasing decisions on so-called process information, not just product price.[17]

This case settled, so the California Supreme Court never decided the product versus process controversy as the test for determining whether a statement was commercial speech. As a result, unlike environmental attributes subject to FTC guidelines, process-related statements concerning social issues such as the labor practices under which a product is developed, still exist in a sort of regulatory twilight zone. They might be subject to truth-in-advertising rules in which case the advertiser must tell the truth—or they might not, in which case the advertiser can fudge things. Either way, Nike agreed to donate $1.5 million to a worker's rights organization, without admitting liability in any way.[18]

Key Terms

greenwashing
carbon negative
sweatshop labor
commercial speech
product versus process information

Practical Applications

1. Advertising statements concerning your company's environmental sourcing practices should be truthful and fair.
   a. The best way to ensure this is to have the same sustainability metrics employed across all divisions of the company—at least between the supply managers and the marketing professionals.
   b. Establish standardized definitions of terms used for marketing sustainability. That is, both teams should employ identical meanings for terms such as environmentally friendly, nontoxic, and the like.
   c. Be able to substantiate claims. When marketing personnel want to claim a product is "100 percent Organic," for instance, the sourcing personnel must be able to attest to this fact, and provide documentation.
2. Advertising statements concerning your suppliers' labor practices should be truthful and fair.
   a. Without some degree of oversight of overseas supplier labor practices—through site inspections, audits, or some form of

accountability mechanism—marketing claims about socially responsible labor use are potentially deceptive.

b. Verify that suppliers are in compliance with your company's code of conduct before attempting to market "fair labor" or similar descriptors.

c. Assume that anything your suppliers do to their employees can and will be attributed to your company by the media or customers.

3. Avoid greenwashing by taking credit only where credit is due.

a. Do not overstate your company's contribution to sustainability. A substantial environmental benefit modestly advertised is better than an exaggerated claim about a minor environmental improvement.

b. Understating your company's commitment to sustainability is more credible to the impartial observer, less likely to generate hostility from skeptics, and easier to support with sufficient evidence.

c. Do not make claims about the social or environmental aspects of your company's supply chain if you cannot provide credible, specific verification of these claims. This principle of marketing integrity is valid even in the absence of legal mandates.

4. Marketing yourself as a sustainable company without undertaking the necessary internal changes to make that a reality simply invites litigation and controversy. Whatever marketing benefit one derives from greenwashing is short-lived relative to the reputational damage that comes when greenwashing is exposed for what it is.

PART V

Legal Compliance and Climate Change Mitigation

CHAPTER 11

EPA's Climate Change Programs to Date

Greenhouse gases are not your typical pollutant. We address these atmospheric pollutants here, rather than in Chapter 6 (on air pollution from operations), because the nature of the risk created and the sources of the pollution are distinct from those conventional airborne pollutants currently regulated under the Clean Air Act. For one, greenhouse gases, unlike hazardous air pollutants or volatile organic compounds, are not inherently toxic or dangerous to breath. Every living, breathing creature exhales carbon dioxide, so it seems odd, at first blush, to regulate it as a pollutant. The risk arises when greenhouse gases are released into the atmosphere at extreme volumes, thereby interfering with the chemical composition of the atmosphere, and after a circuitous causal chain, disrupting global climate stability. Secondly, greenhouse gases come from a variety of industry sectors and commercial activities, not just operations like manufacturing. Before diving into the regulatory proposals to address climate change, this chapter begins with an explanation of the basic scientific foundation for regulating this global atmospheric pollutant.

The Scientific Rationale for Carbon Dioxide Regulations

The most influential accounts of climate change, its causes, and its future, come from a series of reports issued since 1990 by the Intergovernmental Panel on Climate Change (IPCC).[1] According to the IPCC, the planet's surface temperature increase is caused by human activity, known as *anthropogenic forcing*, the driving force behind climate change. Although scientific uncertainties can influence regulatory developments, this book is not the place for an in-depth treatment of the scientific issues. Our

concern here is the role of legal compliance in running a sustainable business, so we must deal with the regulatory advances that are taking place as they come.

Greenhouse gases trap heat within Earth's lower atmosphere by allowing direct, warming sunlight to reach the planet's surface, and then absorbing re-radiated energy that would otherwise reflect back into space, over time gradually heating the planet.[2] Atmospheric concentrations of greenhouse gases have risen steadily since the 1800s as an exponentially growing human population has increased its reliance on hydrocarbon-based fuel sources, and atmospheric pollution-emitting commercial activities have proliferated. The increase in global average annual surface temperature from 1800 to 2000 is characterized in the scientific research as a "near linear increase" in temperature.[3] The rate of temperature increase is eerily correlated with the increase in hydrocarbon consumption, growing in speed with the epochal changes in the global economy.

After the first industrial revolution of the early 1800s, we started burning coal to produce steam-powered machines, and economic foundations shifted from agriculture to manufacturing. This is when humanity began in earnest to take hydrocarbons from deep in the earth, combust them, and release them into the atmosphere in the form of greenhouse gases. By the Second Industrial Revolution of the 1880s, characterized by steel milling and mass production, global annual surface temperature began to increase every decade as smokestacks proliferated. By the dawn of the Third Industrial Revolution in the 1970s, characterized by the economic shift from manufacturing to service industries, as well as new industrial development outside of the Western hemisphere, the rate of increase in global annual temperature averages increased again.

"Global average surface temperature has risen at an average rate of 0.15°F per decade since 1901," and "worldwide, 2001–2010 was the warmest decade on record since thermometer-based observations began."[4] According to the latest assessment report from the IPCC, "the observed pattern of tropospheric warming … is *very likely* due to the influence of anthropogenic forcing, particularly that due to greenhouse gas increases"; and "surface temperature extremes have *likely* been affected by anthropogenic forcing."[5] If we continue along with business as usual, with greenhouse gas emissions continuing to increase, the IPCC projects continued

(if not accelerated) increase in global average surface temperature, with catastrophic climatic consequences for humanity over the next 10 to 100 years. Just what are the consequences of climate change due to global warming?

In the landmark lawsuit *Connecticut v. American Electric Power Co. Inc.*, a handful of states sued several coal-powered utility companies (the largest emitters of greenhouse gases in the United States) for causing damages to human health and natural resources by contributing to climate change.[6] Although the case was ultimately dismissed on procedural grounds, the allegations included a laundry list of major problems resulting from climate change, divided into current and projected future injuries. Current *climate change impacts* include reduced mountain snowpack, earlier melting and associated flooding, reduced summer streamflows, declining water supplies that injure property owners, and coastal erosion.[7] Future climate change impacts include: sea-level rise leading to more severe floods; injuries to coastal infrastructure, including airports, subway stations, tunnels, vent shafts, storm sewers, wastewater treatment plants, and bridges; permanent inundation of coastal property; salinization of marshes and tidelands; destruction of wildlife habitats; accelerated beach erosion; saltwater intrusion of groundwater aquifers; lowered water levels in the Great Lakes and corresponding disruption of hydropower production; threatened agriculture; increased frequency and duration of heat waves; increased wildfires; loss of hardwood forests and fish populations; general widespread loss of ecological and aesthetic value of property; and the loss of scientific and educational uses of land (such as pharmaceutical uses of plants, botanical research, field trips, etc.).[8]

Keep in mind these allegations of injury are limited to impacts experienced in the United States. The full extent of global impacts associated with climate change is much worse, and include the geographic spread of tropical diseases and respiratory illnesses, and population death and dislocation due to water shortage and sea-level rise, respectively.[9] All of these impacts are occurring now, or are forecasted to occur, because of unbridled greenhouse gas emissions. There are six major kinds of greenhouse gases, but "of these, carbon dioxide, produced by combustion of fossil fuels, is by far the most prevalent, accounting for 85% of the annual emissions when measured in CO_2 equivalents."[10] The sources of greenhouse gas emissions can be broken down into categories of emitters. See Table 11.1.

Table 11.1 Sources of U.S. greenhouse gas emissions by category*[11] (as of 2010, by million tons of CO_2 equivalent)

Source	2010 Emissions	% of Total U.S. GHG Emissions (%)
Electricity Generation	2306	34
Coal-fired	1840	27
Natural gas–fired	405	6
Oil-fired	31	< 1
Transportation	1834	27
Passenger cars	769	11
Light-duty trucks	320	5
Medium and heavy duty trucks	390	6
Aircraft[a]	144	2
Industry[b]	1394	20
Agriculture	495	7
Commercial	382	6
Residential	365	5

Source: U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2010, April 15, 2012.

*McCarthy (2013).

[a]*Exclu*des international use of aviation fuel.

[b]*Inclu*des numerous industries, such as iron and steel production, petroleum refining, cement kilns, and others.

There are other major environmental impacts associated with unbridled carbon dioxide emissions that should drive policy makers to curb carbon dioxide emissions, beyond the risk of planetary warming. Specifically, the oceans have absorbed 30 percent of humanity's carbon dioxide emissions since the Industrial Revolution, which has increased the acidity of the oceans by 26 percent.[12] This is because the oceans act as a "carbon sink," absorbing excess carbon dioxide, which decreases the natural pH of seawater. "Ocean acidification causes ecosystems and marine biodiversity to change. It has the potential to affect food security and it limits the capacity of the ocean to absorb [additional] CO_2 from human emissions. The economic impact of ocean acidification could be substantial."[13] Therefore, even if the official narrative about carbon dioxide warming the planet is incorrect, there is undeniable evidence that carbon dioxide

emissions are damaging ocean ecosystems, which jeopardizes the marine food web upon which a large portion of the human population depends for sustenance and employment. Despite the controversies surrounding the official narrative of anthropogenic forcing, we have ample reason to reduce carbon dioxide pollution.

According to the largely consensus-driven scientific narrative, human-generated greenhouse gases are overheating the nest; yet we continue adding fuel to the fire with increased emissions. The best way to address the problem, then, would be to reduce the volume and concentration of greenhouse gases in the atmosphere. This can be accomplished either through greenhouse gas emission source reduction or carbon capture and sequestration. These alternative solutions (reducing or capturing) make up the gist of greenhouse gas regulations.

Current and Prospective Regulation of Greenhouse Gases

From the 1990s, when climate change became identified as a real environmental problem, until 2007, it was not clear that the EPA even had legal authority to address climate change. In 2007, the U.S. Supreme Court finally settled the issue in *Massachusetts v. EPA*, deciding that greenhouse gases are "air pollutants" within the meaning of the Clean Air Act, and thus subject to EPA jurisdiction.[14] The upshot of this ruling was that if the EPA made certain scientific findings related to the adverse impacts of greenhouse gases, it would be forced as a matter of law to regulate those gases as an atmospheric pollutant according to the statutory mechanisms of the Clean Air Act.

The Administrator of the EPA is required to follow the language of Section 202(a) of the Clean Air Act in making science-based endangerment and cause-or-contribute findings for mobile sources. Similarly, under Section 111 of the Clean Air Act, the EPA Administrator is required to set standards for categories of new (or substantially modified) major sources if, in her judgment, they cause or contribute significantly to air pollution, which may reasonably be anticipated to endanger public health or welfare. Section 111 applies to stationary sources of pollution, as opposed to Section 202(a)'s application to mobile sources. Both

sections require an endangerment finding and a cause-or-contribute finding before the EPA can regulate greenhouse gases as a pollutant.

Corporate Average Fuel Economy Standards for Mobile Sources

On December 9, 2009, the Administrator for the EPA released two findings related to greenhouse gases.[15] The first was an *endangerment finding*, meaning the EPA, based on sound science, had determined that current and projected emissions of greenhouse gases into the atmosphere may reasonably be anticipated to endanger public health and welfare of current and future generations. The second was a *cause-or-contribute finding* for mobile sources (vehicles, trucks, etc.), meaning that mobile sources of greenhouse gas pollution was identified as causing or contributing to said endangerment. These two findings laid the foundation for EPA to regulate greenhouse gases from mobile sources.

At the earliest stages of the EPA's climate change initiatives, the automobile and truck manufacturing industries in the United States have been the major focal point for greenhouse gas regulations. The *Corporate Average Fuel Economy* (CAFE) and Greenhouse Gas emissions regulations for mobile sources are promoted jointly by the National Highway Traffic Safety Administration (NHTSA) and the EPA, for the express purposes to "help address our country's dependence on imported oil, save consumers money at the pump, and reduce emissions of greenhouse gases that contribute to global climate change."[16]

NHTSA and EPA teamed up to develop "new requirements for a fuel economy and environment label that will be posted on the window sticker of all new automobiles sold in the United States. The redesigned label provides expanded information to American consumers about new vehicle fuel economy and fuel consumption, greenhouse gas and smog-forming emissions, and projected fuel costs and savings[.]"[17] Specifically, the regulations require automobile and truck manufacturers to achieve reductions in fleet-wide averages of fuel economy and carbon dioxide emissions, which constitute 97 percent of the greenhouse gases emitted from mobile sources. That means one model vehicle may have standard fuel economy as long as other models within the corporate fleet offset those emissions with more stringent controls.

Between 2010 and 2012, the EPA promulgated emissions standards for model year 2011–2016 cars and light trucks, model year 2014–2018 medium and heavy-duty trucks, and the second phase of standards for cars and light trucks, covering model years 2017–2025.[18] The Gas Guzzler Tax targets fuel-inefficient passenger cars that fail to meet CAFE standards. The tax is levied by the Internal Revenue Service against the vehicle manufacturer, and must be posted on the window stickers of new cars. The lower the fuel economy, the higher the tax.[19]

These fuel economy standards and related regulations are designed to encourage automobile and truck manufacturers to design vehicles that reduce the emissions of greenhouse gases—specifically carbon dioxide—that result from mobile sources. This source reduction strategy, requiring incremental improvements in sustainable performance over a long period of time, is perhaps more efficient than taxing individual consumers or mandating electric fleets.

Increased fuel economy happens to create the concomitant benefit of reducing greenhouse gas emissions, so targeting mobile sources of greenhouse gas emissions through improved fuel economy standards was a sort of low-hanging fruit for the EPA. That said, these regulations are prospective in nature, and even if they received 100 percent compliance, this program would only address 22 percent of the U.S. contribution of greenhouse gases (see the items under "Transportation" in Table 11.1, above). "As extensive as these actions may seem, they have had relatively minor impacts on GHG emissions to date."[20]

New Source Performance Standards for Power Plants

Power plants, specifically coal-fired energy generating units, represent 27 percent of the U.S. contribution of greenhouse gases. In order to address emissions from these stationary sources, the EPA plans to set New Source Performance Standards pursuant to Section 111 of the Clean Air Act. These standards are mandatory when the Administrator of the EPA determines that a category of sources causes or contributes significantly to air pollution, which may reasonably be anticipated to endanger public health or welfare. The endangerment and cause-or-contribute findings are similar here as they are to mobile sources.

Recall the language from the Clean Air Act discussed in Chapter 6. New Source Performance Standards are meant to reflect the degree of emissions limitations achievable through the application of best available control technology (BACT), or the best commercially demonstrated system of emissions reductions achievable given costs, environmental impacts, human health impacts, and energy requirements.

The EPA's proposal to regulate greenhouse gases from coal-fired power plants through New Source Performance Standards would establish "a limit of 1,100 pounds of carbon dioxide (CO_2) per megawatt-hour (MWh) of electricity generated for new coal-fired electric generating units (EGU)."[21] The most advanced coal-fired EGUs coming online today are supercritical pulverized coal-fired power plants, and even they would emit greenhouse gases about 40% in excess of the Clean Air Act's New Source Performance Standards.[22]

In order to meet the potential greenhouse gas NSPS for coal-fired EGUs, the owner and operator of these units would need to adopt *carbon capture and sequestration* technology, which prevents carbon dioxide from entering the atmosphere by storing it below ground. "Coal is so heavily laden with carbon that meeting [the proposed greenhouse gas] limit would require operators to scrub carbon dioxide from their emissions before they reach the smokestack, and then pump it into permanent storage underground."[23]

There is an open debate about whether carbon capture and sequestration technology has been "adequately demonstrated" per the statutory standard. Although "carbon-capture technology has been proven to work in trials, [according to industry] the infrastructure to ship and store such vast deposits of carbon does not exist, and the technology is in any case so costly that it would make new coal plants economically unfeasible."[24] The industry position here is both true and false. Yes, there are uncertainties in whether carbon capture technology can be scaled to provide sufficient emissions reductions to allow a large-scale new coal-fired power plant to meet the proposed standards. However, this standard is intended to create the conditions of regulatory certainty needed to stimulate research, development, and demonstrations in carbon capture technology.[25] There are many reasons why new coal-fired power plants are uneconomical—among them, "the abundance and low projected cost of natural gas, the

many state requirements that increasing amounts of electricity come from renewable sources, and the increasing cost of coal-fired electricity due to higher coal prices and new emission standards for emissions of conventional and toxic air pollutants."[26] In other words, the New Source Performance Standard for greenhouse gas emissions from coal-fired EGUs is not what is putting a halt to new coal-fired EGU construction—coal-fired power is just becoming inefficient.

As the EPA's Regulatory Impact Analysis explained, "even in the absence of this rule, existing and anticipated economic conditions in the marketplace will lead electricity generators to choose technologies that meet the proposed standards."[27] During 2013, none of the 136 power plants that will open or expand generating capacity in the United States burns coal, and during 2014, only 2 of the 127 power plants set to open or expand will be coal-fired.[28] Market conditions have already shifted the electric utility sector away from coal as a fuel source and toward alternatives such as natural gas and renewables. As a result, this is admittedly a rule that doesn't make a difference. "EPA anticipates that the proposed EGU New Source GHG Standards will result in negligible CO_2 emission changes, energy impacts, benefits or costs for new units constructed by 2020. Likewise, the Agency does not anticipate any notable impacts on the price of electricity or energy supplies."[29]

Because the EPA doesn't anticipate their EGU New Source GHG Standards will make a difference at all, it becomes a mystery why they would promulgate these standards in the first place. One must look to the statute for an explanation.

Existing Power Plant Performance Standards

Once the EPA has promulgated standards for new sources of greenhouse gas pollution, it is required under Section 111(d) of the Clean Air Act to promote standards for existing sources of that category of pollution. "[T]he promulgation of New Source Performance Standards, even if the standards have little or no effect on new sources, serves as the precondition for standards affecting existing units.… EPA would have no legislative authority to promulgate such standards if it did not first establish standards for new sources."[30] Clean Air Act Section 111(d) ties standards

for existing sources of pollution to standards for new sources, as existing source standards are defined as "standards of performance for any existing source ... to which a standard of performance under this section would apply if such existing source were a new source." While the regulation of new sources leaves unregulated the thousands of existing sources of greenhouse gases that continue to churn out carbon dioxide pollution, it was the precondition for addressing the real problem.

As a starting point open to revision, EPA proposed that existing plants would be "allowed to average their emissions over a 30-year period: during the first 10 years, such facilities could have emitted up to 1,800 lbs. CO_2/MWh; the facility would then have needed to reduce emissions to 600 lbs/MWh for the following 20 years."[31] This would give existing facilities time to adapt to these standards. Alternatively, "compliance can be measured using a rolling average of emissions for 12-month periods or it can be measured using the rolling average for 84-month periods. If the facility chooses the longer compliance measurement period, it would gain flexibility to exceed the proposed standard over longer periods of time, but it would need to meet a lower standard overall."[32] Ultimately, what will matter to the EPA appears to be average emissions over time, rather than hardline thresholds for emissions at all times. In this way, greenhouse gas regulations will differ from those regulations for conventional and hazardous air pollutants, discussed in Chapter 6.

The various states within the United States will be primarily responsible for developing standards for greenhouse gas emissions from existing sources. The Obama administration has announced that states will be required to submit State Implementation Plans for greenhouse gas regulations for existing sources by June 2016; per the statute, if a state fails to do so, EPA will develop an emissions regulation plan instead.[33] What kinds of regulations should owners and operators of existing power plants expect from these State Implementation Plans? They may very well differ from state to state. Some states may require carbon capture and storage technology, whereas others may require pollution scrubbing technology, and others still might require increased operational efficiencies that result in the generation of less airborne pollution in general. Joining the policy debate over how states should address existing sources, the Natural Resources Defense Council (NRDC) has developed a version of

a "cap and trade" program for existing sources of carbon dioxide pollution that has generated a lot of attention because of the flexibility and economic incentives their plan would create.

The NRDC plan has two major features: a total carbon dioxide emissions cap that can be met by obtaining "credits" measured in terms of tons of CO_2 emissions avoided, and flexible mechanisms for obtaining these credits. The total CO_2 emissions allowance would be established at a level consistent with the protection of the environment and public health and welfare, but instead of requiring any specific type of technology, the regulations would provide a variety of options for reducing carbon dioxide emissions. Emission reduction credits could be achieved "by shifting dispatch to lower emitting plants, by increasing dispatch from non-emitting plants, and by increasing end-use energy efficiency."[34] Similar to rollover minutes on a cellphone contract, "emission reduction credits not needed for compliance in a given year could also be retained ('banked') for use later."[35] The means by which a source of greenhouse gas pollution may obtain credits is also flexible: "A source may comply by meeting the emission rate standard on its own[; alternatively,] a set of sources may comply by averaging their emission rates. For example, a coal plant may average with a gas plant, such that their total emissions divided by their combined electricity output meets the applicable state standard."[36] Although this variety of a cap-and-trade plan for existing sources of carbon dioxide pollution has much to offer (in terms of incentives for emissions reduction, efficient administration, cost of compliance, and flexibility), we will simply have to wait until standards are promulgated to find out what exactly existing sources of greenhouse gas emissions in the US must do by way of managing emissions.

Reporting Standards for Owners, Operators, and Suppliers

Although the United States has not yet implemented legal requirements for most industrial polluters to reduce greenhouse gas emissions, *monitoring and reporting* the quantity of greenhouse gases is mandatory for "owners and operators of certain facilities that directly emit" greenhouse gases, as well as suppliers of products that would emit greenhouse gases "from combustion or use of the products supplied."[37] The EPA's

Greenhouse Gas Reporting Program "will help us better understand where greenhouse gas emissions are coming from and will improve our ability to make informed policy, business, and regulatory decisions."[38] This reporting program also increases transparency in the private sector substantially. Anyone with Internet connection, and that includes concerned citizens, journalists, and shareholders, can locate stationary sources of greenhouse gas pollution using local maps and zip code information with EPA's Facility Level Information on GreenHouse gases Tool (FLIGHT).[39]

The facilities subject to the Greenhouse Gas Reporting Program are for the most part any facility that emits equal to or greater than 25,000 metric tons CO_2e [carbon dioxide or its equivalent GHG] per year in combined emissions from stationary fuel combustion units or miscellaneous uses of carbonate, or that supplies products with that emission potential.[40] Facilities must submit reports every calendar year detailing the prior year's emissions,[41] using the EPA's metrics for global warming potentials,[42] units of measure conversions,[43] and data elements for emissions equations.[44] Emitting facilities must report in metric tons all emissions of biogenic CO_2, man-made CO_2, CH_4, N_2O, and fluorinated greenhouse gases.[45] Suppliers must report annual quantities of the same GHGs in terms of how much would be emitted from combustion or use of products supplied, imported, and exported that year.[46] Facilities and suppliers over the 25,000 metric ton CO_2e threshold must install and properly calibrate GHG measuring devices and keep emissions records for three years.[47] The Code of Federal Regulations spells out the mandatory formulas used to calculate GHG emission volumes. "Any violation of any requirement of this part shall be a violation of the Clean Air Act[.] A violation includes but is not limited to failure to report GHG emissions, failure to collect data needed to calculate GHG emissions, failure to continuously monitor and test as required, failure to retain records needed to verify the amount of GHG emissions, and failure to calculate GHG emissions following the methodologies specified in this part. Each day of a violation constitutes a separate violation."[48]

Key Terms

anthropogenic forcing
greenhouse gases

climate change impacts
carbon dioxide
endangerment finding
Corporate Average Fuel Economy standards
carbon capture and sequestration
Greenhouse Gas Reporting Program

Practical Applications

1. Establish a corporate policy on greenhouse gas emissions.
   a. Decide whether your company will lead or follow on the issue of reducing greenhouse gas emissions. Leaders go beyond compliance with legal requirements; followers shoot for mere compliance.
   b. Incorporate greenhouse gas management strategies into supply chain and operations activities. Think in terms of source reduction, operational efficiency improvements, pollution control technologies, carbon capture, and carbon offsets.
   c. Develop an honest and fair marketing strategy that explains what your company is doing to manage greenhouse gas emissions.
2. Determine the extent of your company's contribution to greenhouse gas emissions by volume.
   a. Ascertain whether compliance with EPA's Greenhouse Gas Reporting Program is mandatory.
   b. Establish baseline emissions levels for benchmarking purposes.
   c. Decide whether these emissions are material (specifically, whether they could eventually subject the company to environmental compliance costs under the Clean Air Act) and thus should be disclosed to shareholders.
   d. Remember, even if your company does not directly emit greenhouse gases, it may be responsible for them insofar as your company's suppliers emit these pollutants in the course of providing goods and services for your company.
3. Understand your company's vulnerability and exposure to climate change impacts.
   a. Establish the likelihood that your company will experience a supply chain or operational disruption resulting from an increased

risk of extreme weather events such as droughts, floods, and hurricanes. Plan for these risks to avoid costly business interruptions.

b. Improve the resilience of supply chain and operations activities to climate change impacts through risk mapping, site-selection decisions, product design, supplier selection, and facility design. The less your company depends upon stable weather the better off it will be relative to vulnerable competitors.

Conclusion

Reflections on Government Solutions to Environmental Problems

Even for advocates of limited federal government involvement in private sector activity, there are certain responsibilities that it makes sense for the government, rather than the private sector, to fulfill. National defense is one of these responsibilities. Considered a public good, national defense is nonexcludable and nonrival. The same can often be said for environmental resources. Without government protections, no one in a free market would have sufficient incentives to manage and steward environmental resources for the public benefit.

Another reason for environmental law versus an unregulated market is the problem of cross-border pollution. Environmental pollution does not limit itself to political boundaries, only harming those responsible for its creation. Without common, somewhat universal standards for environmental protection, upstream polluters would be able to externalize risks of water pollution to downstream stakeholders with impunity. Those upwind would be able to emit as much toxic air pollution as they wanted without fear of exposure, and while they capture all the economic benefits of that polluting activity, it would be downwind stakeholders who suffer all the health consequences. In that way, federal environmental laws protect the majority from risks that could otherwise be created by a geographically privileged minority.

Lastly, federal environmental and public health laws, including workplace safety rules, have been traditionally justified as necessary to prevent a race to the bottom. The argument goes like this. If the various states were primarily responsible for pollution controls and worker safety standards, we might expect states to compete with one another to attract industry migration by lowering these standards. Lower standards

could mean lower operating costs, which are a more attractive forum for business. However, the race to the bottom leads to suboptimal allocation of resources: states end up demanding less care than they should from corporate actors, yet the multistate incorporation option (companies can incorporate in whichever state offers the ideal regulatory environment) creates a one-way ratchet that steadily decreases the stringency of environmental and public health protections. Uniform federal environmental law prevents this race to the bottom from happening.[1]

Notwithstanding the foregoing defense of federal environmental and public health laws, there are still problems with these legal regimes in terms of the effects they create on the market. For one, technology-based standards run the risk of mandating technology that is less than ideal, simply because it happens to be the best currently available. Such standards force industry to adopt technology when it may be premature or inefficient in the long run, depriving industry of the incentive to innovate by expending those R&D resources in compliance costs. Furthermore, when environmental laws are too stringent, they may have a crippling effect on industry growth, expansion, or value-creating activities. The cost of pollution should outweigh the cost of compliance efforts designed to reduce that pollution, but this is not always the case. Lastly, while federal environmental laws do aim to create a level playing field, they also create substantial barriers to entry for new companies, due to the monitoring, reporting, compliance, and other costs associated with the legal environment of business. The largest companies operating at the greatest economies of scale will usually have an easier time complying with the law, regardless of the size of their environmental footprint. In this way, environmental laws could keep big dirty industry in business while undermining sustainable start-ups.

So, with all of the politicized debate about the role of the federal government in addressing climate change, and all of the allegations that EPA regulations kill jobs, what should the private sector be doing on the subject of environmental and public health protection? Proactive innovation seems the obvious answer. If the private sector would take responsibility for the environmental and public welfare issues created by commercial and industrial activity, there would be less need for industry-specific governmental enforcement. Of course, regulations are based on

extensive scientific research that is best funded by public institutions, so there will be an enduring role for government guidance regardless of the private sector commitment to sustainability. But it is by neglecting to care adequately for the adverse impacts of corporate conduct that the private sector invites government regulation.

Most of the laws discussed in this book were predicated on poor environmental stewardship by industry: toxic rivers spawned the Clean Water Act; toxic air spawned the Clean Air Act; toxic waste spawned the Resource Conservation and Recovery Act; toxic working conditions spawned the Occupational Health and Safety Act, and so on. In general, these laws exist because the private sector could not be trusted to police itself. It is for that reason that it is inappropriate for advocates of deregulating the private sector to complain that these laws exist or that they are being enforced. It is akin to the culprit of a fatal hit-and-run at a crosswalk complaining about the inconvenience of school-zone speed limits. As the expression goes, we must sleep in the bed we make.

That said, by adopting principles and practices of sustainability in the management of supply chain, operations, and marketing activities, the private sector could substantially reduce the need for governmental involvement in how we do business. Companies going beyond mere compliance with the laws will enjoy long-term competitive advantages vis-à-vis those companies that shoot only for mere compliance with the laws. Legal compliance is just the starting point for running a sustainable company. Going beyond mere compliance is the hallmark of the sustainable enterprise.

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Conclusion

1. This traditional rationale has been called into question for a variety of reasons, one being that federal environmental law and regulations have not adequately dealt with the problem of interstate externalities. For more, *see* Revesz (1997).

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The Role of Legal Compliance in Sustainable Supply Chains, Operations, and Marketing

John D. Wood

Sustainability is a global megatrend with ramifications across all functional areas of business. This book addresses an underdeveloped topic in the field of sustainable business—the use of corporate resources dedicated to legal compliance.

In order to comply with the law, supply chain, operations, and marketing professionals must know what the applicable legal frameworks are. In order to promote sustainable business, these same professionals must go beyond mere compliance with these laws. This book will assist you in both respects by (1) offering concise discussions of the primary legal frameworks governing the social, economic, and environmental dimensions of supply chain management, operations management, and marketing; and (2) making the business case for going beyond mere compliance with legal requirements.

Written by an expert in environmental law and public policy, this book argues that companies that go beyond mere compliance with social, economic, and environmental safeguards inherent in legal regimes will capture greater benefits and incur fewer risks from their supply chain, operations, and marketing activities.

John D. Wood is the Executive Director of Econautics Sustainability Institute (ESI), a nonprofit dedicated to promoting sustainability in the private sector through research, education, and advising. Wood also serves as Legal Counsel for Suncoast Claims, Inc., and is a legal scholar with publications in the *Environmental Law Reporter*, *NYU Environmental Law Journal*, *NYU Journal of Law and Liberty*, and many others. Wood earned his JD from New York University School of Law and his BA in English and Philosophy from Texas Christian University; he is a member of the New York State Bar.

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