10

Voluntary Environmental Compliance

INTRODUCTION

The previous chapter examined tax compliance, an area where legal obligations are clearly defined – taxpayers are only required to pay taxes on taxable income. Therefore, voluntary compliance primarily depends on how individuals' perceptions of enforcement and monitoring influence their willingness to meet these established obligations. In contrast, environmental compliance presents a greater challenge, as many behaviors that impact the environment are entirely voluntary choices – such as whether to fly, use public transportation, or choose plant-based meat alternatives.

Indeed, this chapter on environmental regulation seeks to enhance our comprehension of behavioral changes that cannot be solely enforced by law. For example, shifting to an electric vehicle or adopting green energy sources involves more extensive changes in behavior than does other compliance behavior, and coercion or imposing a duty may not be applicable in certain circumstances. This gives rise to several questions. What are the barriers to change in different countries? How will the different regulatory instruments affect the public views regarding alternative energy resources? Does public participation increase or decrease the public's willingness to switch to alternative energy resources? Do individuals and groups/collectives respond differently to efforts to change behavior regarding solar panels, electric cars, or other alternative energy sources? Does the choice of regulatory instrument vary depending on the target audience? Who should oversee the attempt to change the behavior of the public – the government or private firms? In the context of environmental issues, our comparison between countries will consider not only differences in motivation but also in the barriers each country faces. We will examine behavioral barriers such as resistance to change or free-riding, legal barriers like bureaucracy, economic barriers, and cultural barriers like community values and autonomy.

THE RISE OF NEW REGULATORY APPROACHES

Overreliance on command-and-control regulation can be behaviorally damaging, particularly in environmental contexts. There is often a significant gap between

simply satisfying regulatory thresholds and adopting innovative and technological modifications, which are often more useful in improving corporate environmental behavior.[1]

In other words, many of the behavioral changes we are interested in cannot be effectively addressed through a traditional command-and-control regulatory system. This is because the behaviors in question, such as flying to a business meeting, while potentially environmentally harmful, is not in itself illegal or universally undesirable. Unlike clear-cut violations such as tax evasion or disregarding mask mandates during the COVID-19 pandemic, these behaviors exist in a gray area where prohibition is neither feasible nor desirable. Instead, they require more nuanced approaches to encourage positive change. We suggest here that more flexible regulations, such as market-based instruments, may be more effective in encouraging environmental compliance, along with technological innovation.

The field of environmental regulation is considered one of the most advanced regulatory areas, with various innovative regulatory options having been examined extensively and studied empirically.[2] Several noncoercive approaches have been implemented in the field of environmental regulation, with less stringent types of regulatory measures being evaluated and compared.[3] For example, voluntary sustainability standards (VSS) are commonly used in environmental contexts as private, market-based regulatory instruments to address sustainability issues in global value chains. Depoorter and Marx's study of VSS institutional design reveals that these standards employ three main mechanisms to foster compliance: enforcement, market incentives, and capacity building.[4] Their analysis shows that while enforcement is consistently used across VSS, there is significant variation in the use of market incentives and capacity-building mechanisms, reflecting differences in VSS approaches to generating compliance.

Overall, as the studies reviewed in this chapter demonstrate, there are many that show the advantages of trust-based regulation (including commitments, intrinsic motivation, and various nudges). However, for the most part, the effect sizes demonstrated in these studies are limited. Even more importantly, the lack of consistency in the effect of intrinsic motivation makes the ability to rely on such mechanisms quite limited. The purpose of this chapter is to analyze the data collected in this field and determine to what extent promoting behavioral change, without relying

[1] Bergquist, Ann-Kristin, et al. "Command-and-control revisited: Environmental compliance and technological change in Swedish industry 1970–1990." *Ecological Economics* 85 (2013): 6–19.

[2] Fiorino, Daniel J. *The new environmental regulation*. MIT Press, 2006; Percival, Robert V., et al. "Environmental regulation." *Law, Science, and Policy* 4 (2003): 1–60.

[3] Black, Julia, and Robert Baldwin. "Really responsive risk-based regulation." *Law & Policy* 32.2 (2010): 181–213.

[4] Depoorter, Charline, and Axel Marx. "Fostering compliance with voluntary sustainability standards through institutional design: An analytic framework and empirical application." *Regulation & Governance* 18.4 (2024): 1132–1152.

solely on coercion, is feasible. It will examine the best practices regarding both corporate environmental compliances,[5] and individual environmental behavior, such as recycling norms.[6]

WHAT MAKES ENVIRONMENTAL REGULATION DIFFERENT

The prevalence of compliance among individuals is less significant in environmental situations compared to scenarios such as pandemic response, where widespread adherence is essential for effectiveness. Moreover, environmental policy objectives are often less precisely defined than those in domains such as taxation, which complicates regulatory efforts. Environmental behaviors usually involve daily choices instead of sporadic actions, making them more pervasive in individuals' lives. The field also deals with challenges related to trusting scientific evidence, which is similar to what was experienced during the COVID-19 pandemic, discussed in Chapter 8. In addition, environmental policies are often politically controversial, dividing people along different ideological lines, although recent mega-studies have shed light on some areas of consensus. Moreover, conflicting identities at community

[5] A meta-analysis of studies showed that nonbinding statements had a significant, even if limited, impact in encouraging companies that signed on to protect the environment. Lokhorst, Anne Marike, et al. "Commitment and behavior change: A meta-analysis and critical review of commitment-making strategies in environmental research." *Environment and Behavior* 45.1 (2013): 3–34. Also see Flankova, Svetlana, et al. "A meta-analysis of the effectiveness of voluntary environmental programs." *Academy of Management Proceedings* 1 (2018): 1–4. A study that surveyed the top 100 corporations in China showed that institutional regulation had a negative impact on green technology innovation, while self-regulation had a positive effect on it. See Li, Dayuan, Fei Tang, and Lu Zhang. "Differential effects of voluntary environmental programs and mandatory regulations on corporate green innovation." *Natural Hazards* 103 (2020): 3437–3456.

[6] Knowledge about recycling and social pressure have been found to be two factors that greatly influence recycling behavior among students. Environmental concerns, conservation behavior, and behavioral experience also correlate with recycling participation. For more, see: Clay, Sean. "Increasing university recycling: Factors influencing recycling behaviour among students at Leeds University." *Earth and Environment* 1 (2005): 186–228. Findings show that a more reliable collection service, more evidence that the funds generated were being used for neighborhood improvement, and a better information system about the environmental program would increase and sustain residents' voluntary separation of waste. See Hernández, Orlando, Barbara Rawlins, and Reva Schwartz. "Voluntary recycling in Quito: Factors associated with participation in a pilot programme." *Environment and Urbanization* 11.2 (1999): 145–160. When employees feel supported by their organization, they become more committed and satisfied and are willing to engage in OCBE (organizational citizenship behavior for the environment). Whereas a direct effect is reported for employee commitment to the organization, findings indicate that perceived organizational support and job satisfaction have an indirect effect on OCBE. See Paillé, Pascal, and Olivier Boiral. "Pro-environmental behavior at work: Construct validity and determinants." *Journal of Environmental Psychology* 36 (2013): 118–128. Transformational leadership directly and indirectly affects employees' voluntary pro-environmental behavior. See Robertson, Jennifer L., and Erica Carleton. "Uncovering how and when environmental leadership affects employees' voluntary pro-environmental behavior." *Journal of Leadership & Organizational Studies* 25.2 (2018): 197–210.

and state levels, as observed in countries like France and Israel, can complicate environmental compliance.[7] Finally, motivating pro-environmental behavior can be complex due to the dichotomy between local and global environmental harm, immediate and tangible impacts versus long term and global consequences. The multifaceted nature of environmental regulation highlights the need for nuanced, context-specific approaches that promote voluntary compliance. This is especially important since multiple factors contribute to environmental regulation.

The unique regulatory strategies employed in environmental contexts, as distinct from other cases examined in this book, can be illustrated through a key study on recycling regulation. Wesley Schultz investigated the impact of feedback on community curbside-recycling behaviors. The research involved 120 households and provided valuable insights into how feedback mechanisms can influence recycling participation.[8]

In the study, participants were divided into five household groups to test different recycling interventions: One received only a basic recycling request, another got personalized feedback with their request, a third received community-level feedback alongside the request, a fourth was given general recycling information with their request, and the fifth served as a control group with no intervention.

Analysis showed that only the groups receiving either individual or neighborhood feedback demonstrated meaningful increases in recycling behavior compared to initial levels. The other approaches failed to produce significant changes. These findings indicate that while feedback plays a role in changing behavior, it may be most effective when combined with social norms rather than used in isolation.[9]

WHY INTRINSIC MOTIVATION MATTERS FOR ENVIRONMENT

Personal values and beliefs have been found to strongly predict pro-environmental behavior, resulting in more consistent and long-lasting adherence to environmental policies, according to Linda Steg and Charles Vlek.[10] In a 2019 meta-analysis, Alexander Maki and colleagues demonstrated that interventions aimed at increasing intrinsic motivation were more effective in producing positive spillover effects,

[7] Berkebile-Weinberg, Michael, et al. "The differential impact of climate interventions along the political divide in 60 countries." *Nature Communications* 15.1 (2024): 1–12.

[8] Schultz, P. Wesley. "Changing behavior with normative feedback interventions: A field experiment on curbside recycling." *Basic and Applied Social Psychology* 21.1 (1999): 25–36.

[9] Liu, Yuwei, et al. "Integrating norm activation model and theory of planned behavior to understand sustainable transport behavior: Evidence from China." *International Journal of Environmental Research and Public Health* 14.12 (2017): 1–16.

[10] Steg, Linda, and Charles Vlek. "Encouraging pro-environmental behaviour: An integrative review and research agenda." *Journal of Environmental Psychology* 29.3 (2009): 309–317.

thereby influencing other environmental behaviors beyond the targeted action.[11] This study analyzed 293 tests of spillover from 76 published and unpublished studies, providing robust evidence for the effectiveness of intrinsic motivation in promoting sustainable behaviors.

Similarly, Julia Steinhorst and Christian A. Klöckner found that interventions based on intrinsic motivation tended to have more enduring impacts on promoting environmental compliance.[12] This study examined the effects of different types of information framing on pro-environmental behavior and intrinsic motivation, supporting the idea that targeting intrinsic motivation can lead to more lasting behavioral changes.

Nonetheless, here too, there are other conflicting studies, where the relationship between intrinsic motivation and external interventions can be counterproductive or at the least dependent on the level of intrinsic motivation of the regulated entities. For example, Maoliang Ling and Ling Xu cautioned that external interventions, such as financial incentives or regulations, might, in some contexts, diminish people's intrinsic motivation to comply with environmental regulations.[13] This could ultimately result in policies being less effective over time. This study by Ling and Xu examines the potential "crowding-out" effect of external incentives on intrinsic motivation for pro-environmental behavior. Their work contributes to the ongoing debate about the most effective ways to promote sustainable behaviors and environmental compliance.

It should be noted that recent research has challenged some assumptions about the role of political ideology in environmental attitudes. Vlasceanu and colleagues conducted a large-scale study of 59,440 participants across 63 countries,[14] evaluating 11 expert-crowdsourced interventions focused on four climate mitigation outcomes: climate beliefs, policy support, information-sharing intention, and participation in a tree-planting task. The findings revealed that these interventions had modest and varied effects, with their effectiveness largely limited to individuals who were not climate skeptics. Moreover, some interventions actually decreased participation in the tree-planting task. These results suggest that the impact of behavioral climate interventions depends heavily on both the target audience and the specific behavior being encouraged. Similarly, other studies on compliance have emphasized the significance of aspects such as ability and societal expectations in influencing

[11] Maki, Alexander, et al. "Meta-analysis of pro-environmental behaviour spillover." *Nature Sustainability* 2.4 (2019): 307–315.

[12] Steinhorst, Julia, and Christian A. Klöckner. "Effects of monetary versus environmental information framing: Implications for long-term pro-environmental behavior and intrinsic motivation." *Environment and Behavior* 50.9 (2018): 997–1031.

[13] Ling, Maoliang, and Lin Xu. "How and when financial incentives crowd out pro-environmental motivation: A longitudinal quasi-experimental study." *Journal of Environmental Psychology* 78 (2021): 1–10.

[14] Vlasceanu, Madalina, et al. "Addressing climate change with behavioral science: A global intervention tournament in 63 countries." *Science Advances* 10.6 (2024): 1–19.

environmental conduct.[15] This suggests that an approach that considers various factors, both intrinsic and extrinsic, might be required to ensure the effective design and implementation of environmental policies.

THE BEHAVIORAL CHALLENGE OF ENVIRONMENTAL REGULATION

As mentioned in the introduction to this chapter, what distinguishes environmental behavior from most other regulatory domains is the requirement for individuals to internalize, be aware, willing to pay the price, and know what actions to take, among other factors. Simply providing instructions on what to do will only have a limited impact on an individual's environmental behavior, such as on their recycling habits.

Indeed, the threat of environmental damage poses numerous challenges to the health and future of individuals, communities, and the planet.[16] It also provides an opportunity to examine the different voluntary compliance behaviors exhibited by individuals. Another significant challenge related to the environment is the difficulty people face in adopting certain behaviors into their daily lives, leading to what we have termed "affective voluntary compliance." The environment shapes virtually every aspect of daily behavior, from basic energy consumption and recycling to broader lifestyle choices in transportation, consumption, dining, travel, and leisure activities. These choices reflect a growing awareness of environmental impact, as seen in trends like the circular economy and reduced use of disposable items.

THE POWER OF INTRINSIC ENVIRONMENTAL MOTIVATION

One of the unique characteristics of environmental compliance is that there is a wide variation in the levels of commitment to different environmental challenges. This variation can result in situations where individuals are committed to certain values but are not as dedicated to others. The following comparison between local and global harm provides a good example. Some people may be more dedicated to protecting the water in their area as it affects the health of their children or themselves, but they may be far less concerned about carbon emissions to the atmosphere.[17] Another distinct challenge in environmental behavior pertains to the feeling of remoteness that individuals experience when confronted with scenarios

[15] Ernst, Julie, Nathaniel Blood, and Thomas Beery. "Environmental action and student environmental leaders: Exploring the influence of environmental attitudes, locus of control, and sense of personal responsibility." *Environmental Education Research* 23.2 (2017): 149–175.

[16] Kasperson, Jeanne X., and Roger E. Kasperson. *Global environmental risk*. Routledge, 2013.

[17] White, Rob. "Global harms and the natural environment." In *The Palgrave handbook of social harm*, edited by P. Davies, P. Leighton, and T. Wyatt, Palgrave Macmillan, 2021: 89–114. https://doi.org/10.1007/978-3-030-72408-5_5.

in which people's behavior is not classified as a typical social dilemma. This is particularly evident when the type of environmental harm described is local, occurring at the municipal or state level, such as water or air pollution, as opposed to situations where the harm is global, such as global warming. In the following, we will explore whether communities can collaborate to address a local threat. We will examine how each of the described harms could affect interactions with various regulatory interventions.

IDENTIFYING EFFECTIVE REGULATORY INTERVENTIONS

As observed in the introduction of this chapter, the environmental area presents a unique blend of behaviors that cannot be legally bound, such as transportation and purchasing, with those that can be legally regulated, such as recycling and the use of specific chemicals.[18]

Van de Ven and colleagues researched effective environmental policies in the EU and how altering various behavioral patterns can contribute to reducing greenhouse gas emissions.[19] They categorized potential changes in behavior into three groups: food consumption, transportation, and household practices. Each group showed varying degrees of potential to reduce emissions.[20] They found that behavioral changes hold the potential to reduce emissions by 14 percent–40 percent in the EU, depending on the type and extent of behavior adopted. The authors pointed out that a vegan diet could contribute to reducing emissions by 5.4 percent to 8 percent.

Seth Wynes and Kimberly Nicholas,[21] as well as Kate Lacroix,[22] have identified several effective choices for reducing emissions in developed countries. These include limiting childbirth, avoiding car usage, refraining from air travel, and adopting plant-based diets. In 2009, Thomas Dietz and his colleagues analyzed seventeen different household and transportation behaviors and discovered that these actions could result in a 20 percent decrease in household emissions and a 7.4 percent reduction in overall US emissions.[23]

[18] Some of the literature review in this section is based on a report we submitted to the Israeli Democracy Institute in 2023 (www.idi.org.il/books/54536).

[19] Van de Ven, Dirk-Jan, Mikel González-Eguino, and Iñaki Arto. "The potential of behavioural change for climate change mitigation: A case study for the European Union." *Mitigation and Adaptation Strategies for Global Change* 23 (2018): 853–886.

[20] Van de Ven, González-Eguino, and Arto. "The potential of behavioural change for climate change mitigation."

[21] Wynes, Seth, and Kimberly A. Nicholas. "The climate mitigation gap: Education and government recommendations miss the most effective individual actions." *Environmental Research Letters* 12.7 (2017): 1–10.

[22] Lacroix, Karine. "Comparing the relative mitigation potential of individual pro-environmental behaviors." *Journal of Cleaner Production* 195 (2018): 1398–1407.

[23] Dietz, Thomas, et al. "Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions." *Proceedings of the National Academy of Sciences* 106.44 (2009): 18452–18456.

BEHAVIORAL BARRIERS TO ENVIRONMENTAL CHANGE

Having identified the main factors that appear to influence people's decisions in the previous section, we will conduct experimental surveys to determine how various barriers impact their decision-making. We will compare how the same problem is presented to the public and attempt to establish a causal link between the obstacles and people's intention to behave a certain way. This may involve manipulating factors such as trustworthiness, level of cooperation with others, cost, level of uncertainty, rationale provided for the change, or moral and ecological considerations, all while keeping in mind solidarity with future generations and economic implications.

In his 2011 review, Robert Gifford's analysis identifies seven key psychological barriers to environmental action.[24] Among these, cognitive constraints – including limited awareness and outdated beliefs about environmental practices – prevent people from recognizing the urgency of climate issues. Disengagement represents another significant challenge, particularly because the climate crisis's effects are often delayed and people feel overwhelmed by information overload.[25] This disengagement can reduce attention and perceived urgency, worsening the impact of cognitive limitations.

Uncertainty about climate crisis causes often leads people to prioritize immediate personal interests over long-term environmental concerns. This uncertainty, combined with overoptimism, can create a false sense of security that discourages action. Additionally, people's perception of their behavioral control (locus of control) significantly influences their willingness to adopt eco-friendly behaviors. When individuals feel they lack resources or doubt the impact of their efforts against a global crisis, they're less likely to act.

CHANGING PUBLIC ATTITUDES TOWARD THE ENVIRONMENT

A key aim of this book is to examine and classify what we know about noncoercive regulations' effectiveness in changing both behaviors and underlying factors like attitudes and intrinsic motivation. In the context of environmental challenges, trust in science is of utmost importance, drawing parallels to the global response to the COVID-19 pandemic. The immediate and visible consequences of COVID-19, such as people getting seriously ill or dying, acted as a powerful catalyst for people to change their behavior and follow scientific recommendations. Nevertheless, there

[24] Gifford, Robert. "The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation." *American Psychologist* 66.4 (2011): 290–302.

[25] Uba, Chijioke Dike, and Andreas Chatzidakis. "Understanding engagement and disengagement from pro-environmental behaviour: The role of neutralization and affirmation techniques in maintaining persistence in and desistance from car use." *Transportation Research Part A: Policy and Practice* 94 (2016): 278–294.

are clear differences between the environmental context and other domains, such as tax compliance, where conduct is chiefly influenced by the conviction in the scientific principles related to the matter at hand. In contrast, environmental damage is often not as easily visible or tangible, making it difficult to generate public trust and action. Many environmental concerns, such as climate change, air pollution, and the depletion of natural resources, occur slowly over time and may not be immediately noticeable to the human eye. The absence of immediate, visible consequences can create a gap between the scientific evidence and the public's ethical commitment and willingness to engage in pro-environmental behaviors.[26]

To effectively promote trust in science within the environmental context, it is essential to employ strategies that account for the unique challenges and opportunities trust in science presents.[27] This may involve investing in public education campaigns that clearly communicate the scientific evidence behind environmental issues, while also highlighting the tangible benefits of pro-environmental behaviors.[28] Furthermore, building alliances between scientific institutions, local governments, and community organizations can help narrow the divide between scientific knowledge and public action, fostering a supportive environment that encourages trust and engagement.[29]

Additionally, highlighting the advantages of pro-environmental behavior, including enhanced public health, economic savings, and improved quality of life, can assist individuals and communities in realizing the immediate and long-term benefits of relying on science and taking action. Although building trust in science within the environmental context poses its challenges, it also provides valuable opportunities for driving community-based change and creating a broader impact.[30] By identifying and addressing specific aspects and utilizing strategies that appeal to the public and encourage collective action, it is possible to foster greater trust in science and motivate individuals and communities to collaborate toward a more sustainable future.

CULTURAL VARIATION IN ENVIRONMENTAL BEHAVIOR

Throughout the previous chapters, culture has been examined as an intrinsic factor that shapes people's views and behaviors independently of a country's formal legal

[26] Rees, Jonas H., Sabine Klug, and Sebastian Bamberg. "Guilty conscience: Motivating pro-environmental behavior by inducing negative moral emotions." *Climatic Change* 130 (2015): 439–452.

[27] Brewer, Paul R., and Barbara L. Ley. "Whose science do you believe? Explaining trust in sources of scientific information about the environment." *Science Communication* 35.1 (2013): 115–137.

[28] Cvitanovic, Christopher, et al. "Strategies for building and managing 'trust' to enable knowledge exchange at the interface of environmental science and policy." *Environmental Science & Policy* 123 (2021): 179–189.

[29] Lacey, Justine, et al. "Understanding and managing trust at the climate science–policy interface." *Nature Climate Change* 8.1 (2018): 22–28.

[30] Gurău, Călin, and Léo-Paul Dana. "Environmentally-driven community entrepreneurship: Mapping the link between natural environment, local community and entrepreneurship." *Technological Forecasting and Social Change* 129 (2018): 221–231.

framework. Culture has been identified as a factor related to environmental concern, with collectivism associated with greater care for the environment.[31] Cultural values can influence the ethical evaluation of sustainable consumption, making consumers more likely to align their beliefs with their behavioral intentions.[32]

An interesting environmental report on voluntary compliance suggested the potential advantages of comparing voluntary compliance methods.[33] Although many of the countries reviewed in the report rely primarily on monitoring sanctions, some have taken softer approaches to encourage the public to play a more active role in environmental compliance. For example, the report finds that in Singapore, although it has a centralized governance system, streamlining responsibilities has been shown to improve efficiency and effectiveness. An environmental mobile application encourages the public to spot and report violations. Singapore's experience indicates that companies can maintain effective compliance without extensive monitoring from external sources.

Another recent study conducted in Mexico has identified several factors that contribute to improved environmental compliance.[34] These factors include internal management practices, the implementation of norms across all employees, regulatory pressure (such as inspections), public scrutiny, and the size of the company (which was discussed earlier). Studies examining environmental compliance in Europe have highlighted the importance of establishing institutionalized mechanisms for societal monitoring and enforcement at the national level.[35] In the context of promoting environmental compliance in Italy and Greece, nonstate actors, such as environmental nongovernmental organizations and industry associations, have been shown to have played a significant role in raising public awareness about environmental issues and advocating for more stringent environmental regulations.[36]

Research from China reveals a key limitation in corporate environmental compliance: Companies tend to prioritize short-term pollution reduction measures over long-term environmental improvements that require significant investment.[37] This

[31] Kalamas, Maria, Mark Cleveland, and Michel Laroche. "Pro-environmental behaviors for thee but not for me: Green giants, green gods, and external environmental locus of control." *Journal of Business Research* 67.2 (2014): 12–22.

[32] Sharma, Rajat, and Mithileshwar Jha. "Values influencing sustainable consumption behaviour: Exploring the contextual relationship." *Journal of Business Research* 76 (2017): 77–88.

[33] United Nations Environment Programme. "Environmental rule of law: First global report." (2019). www.unep.org/resources/assessment/environmental-rule-law-first-global-report

[34] Dasgupta, Susmita, Hemamala Hettige, and David Wheeler. "What improves environmental compliance? Evidence from Mexican industry." *Journal of Environmental Economics and Management* 39.1 (2000): 39–66.

[35] Bergquist, et al. "Command-and-control revisited."

[36] Koutalakis, Charalampos. "Environmental compliance in Italy and Greece: The role of non-state actors." *Environmental Politics* 13. 4 (2004): 754–774.

[37] Zhou, Yankun, and Hongtao Shen. "Supervision of environmental enforcement and corporate environmental performance: Evidence of quasi-natural experiment from talks on environmental protection." *Nankai Business Review International* 10.1 (2019): 42–66.

is also the case in some parts of Europe, where the effectiveness of criminal sanctions in environmental regulation has been studied and found to be inadequate in deterring harmful actions due to the limited enforcement mechanisms in place.[38]

Evidence for the need to adopt a more nuanced, responsive, and sensitive approach to environmental regulation has come from an interesting study in China.[39] The study aimed to understand how the moral aspect of the law, rather than incentives, has influenced behaviors such as water and electricity conservation and the protection of animals and plants. They have also found that laws have varying effects on people depending on their level of intrinsic motivation. According to the study, the effectiveness of regulations is determined not only by morality or by intrinsic factors, but also by the degree of enforcement. Effective implementation of laws and regulations increases their credibility, which makes it easier for the public to trust and be encouraged.

Even more surprising were the consistent findings that countries with high levels of trust in government, such as Sweden, Switzerland, and Norway, have been successful in reducing pollution through taxation measures. Conversely, in countries with high levels of distrust and corruption, energy producers are unwilling to pay the carbon tax and continue to emit increasing amounts of greenhouse gases.[40]

Regarding the subjects covered in the other chapters, when trying to comprehend the probability of compliance occurring without coercion, we must consider culture. Culture plays a crucial role in almost any compliance study, particularly when intrinsic motivation is viewed as a major factor in explaining compliance.[41]

Cross-cultural heterogeneity refers to the diversity and variations in behaviors, norms, and values across different cultures. Varying cultural backgrounds influence compliance behaviors and can affect the design and implementation of effective regulatory policies across different societies.[42]

Notably, in the field of recycling, differences in recycling rates across the world could signify the impact of cultural and social norms on environmental care. A global recycling rates report highlights significant differences between countries.[43]

[38] Faure, Michael, and Katarina Svatikova. "Enforcement of environmental law in the Flemish region." *European Energy and Environmental Law Review* 19.2 (2010): 60–79.

[39] Chen, Jielin, et al. "How does new environmental law affect public environmental protection activities in China? Evidence from structural equation model analysis on legal cognition." *Science of the Total Environment* 714 (2020): 1–14.

[40] Fairbrother, Malcolm, Ingemar Johansson Sevä, and Joakim Kulin. "Political trust and the relationship between climate change beliefs and support for fossil fuel taxes: Evidence from a survey of 23 European countries." *Global Environmental Change* 59 (2019): 1–15.

[41] McCarty, John A., and L. J. Shrum. "The influence of individualism, collectivism, and locus of control on environmental beliefs and behavior." *Journal of Public Policy & Marketing* 20.1 (2001): 93–104.

[42] Cronert, Axel. "When the paper tiger bites: Evidence of compliance with unenforced regulation among employers in Sweden." *Regulation & Governance* 16.4 (2022): 1141–1159.

[43] "Global recycling league table: Phase one report: Prepared March–April 2024." www.tomra.com/-/media/project/tomra/tomra/about-tomra/documentation/global-recycling-league-table-phase-1-report.pdf.

For example, Germany, Wales, and Singapore have the highest recycling rates in the world, whereas France, Hong Kong, and the United States have the lowest scores.

Vivian Tam and her colleagues conducted a study in Australia to explore the attitudes of practitioners in the construction industry toward recycling.[44] They discovered that, overall, practitioners held positive attitudes toward recycling. However, despite their favorable views, their actual recycling behavior was not as strong as anticipated. It also did not align with their attitudes about recycling when coercive measures were absent.[45]

Studies conducted in both England and Sweden have revealed the various factors that impact household-recycling rates and attitudes. A survey conducted in Exeter, England, revealed that several factors, such as the perceived value of recycling, the availability of curbside-recycling programs, environmental values, social norms, peer influence, personal experiences, and perceived benefits and challenges, play a significant role in shaping individuals' recycling behaviors.[46] Another study conducted in England showcased the achievements of the authorities' recycling program in generating public satisfaction and participation. However, the study also emphasized the necessity for enhancing public involvement to increase recycling rates overall.[47]

Research in Sweden has demonstrated that household-recycling behaviors are shaped by both economic and moral motivations.[48] Households are more likely to recycle when they believe their actions contribute to environmental improvements and when they observe others in their community recycling.[49] Infrastructure plays a crucial role – particularly in multifamily dwellings, where convenient collection systems lead to higher participation rates. Interestingly, while moral norms significantly explain differences in recycling rates between households, their influence tends to diminish when collection infrastructure improves and recycling becomes more accessible.

A study conducted in the Borough of Burnley, England, revealed that the household-recycling rate is only half of the national average, which is 12 percent.

[44] Tam, Vivian W. Y., and Chi Ming Tam. "A review on the viable technology for construction waste recycling." *Resources, Conservation and Recycling* 47.3 (2006): 209–221.

[45] Tam, Vivian W. Y., et al. "Practitioners recycling attitude and behaviour in the Australian construction industry." *Sustainability* 10.4 (2018): 1–23.

[46] Barr, Stewart, Nicholas J. Ford, and Andrew W. Gilg. "Attitudes towards recycling household waste in Exeter, Devon: Quantitative and qualitative approaches." *Local Environment* 8.4 (2003): 407–421.

[47] Williams, Ian D., and J. Kelly. "Green waste collection and the public's recycling behaviour in the Borough of Wyre, England." *Resources, Conservation and Recycling* 38.2 (2003): 139–159.

[48] Specifically, convenience matters in the sense that property-close collection in multifamily dwelling houses leads to higher collection rates. The strength of moral (self-enforced) norms explains a large part of the variation across households, but the importance of such norms in driving recycling efforts partly diminishes if improved collection infrastructure makes it easier for households to recycle.

[49] Hage, Olle, Patrik Söderholm, and Christer Berglund. "Norms and economic motivation in household recycling: Empirical evidence from Sweden." *Resources, Conservation and Recycling* 53.3 (2009): 155–165.

The study found that recycling is more commonly practiced by older and more affluent individuals, whereas younger households tend to have lower rates of recycling participation. Factors such as the availability of storage space and time also influence household-recycling rates, with the widespread terraced housing posing a challenge to achieving high recycling rates.[50] These studies demonstrate that household-recycling behaviors arise from multiple interacting factors. The Swedish research specifically showed how personal moral attitudes and economic incentives affect participation, while convenience of collection systems proved crucial in multifamily housing. Social norms manifest through the positive influence of observing others' recycling efforts and infrastructure accessibility can moderate the impact of moral motivations. Understanding this complex interplay of factors is essential for policymakers and local authorities to design effective strategies that both increase participation rates and improve the quality of recycling programs.

VOLUNTARY CORPORATE ENVIRONMENTAL BEHAVIOR

A study by Mousami Prasad and Trupti Mishra,[51] focusing on CO_2 emissions in India, highlights the need for industries to take responsibility for bringing about meaningful change. The study focuses on the impact of voluntary compliance and reveals that only 33 percent of the sampled firms in the Indian iron and steel sector comply with the International Organization for Standardization 14001 regulations. Empirical research, considering simultaneous factors and various company characteristics, suggests a noteworthy positive correlation between voluntary compliance and improved environmental performance. Therefore, the study suggests that voluntary compliance can be used as an additional policy tool to encourage low-carbon growth in industries. Another study in that same topic investigates the relationship between environmental compliance and firm performance in China.[52] Based on a survey of firms, the authors found that companies that comply with environmental regulations tend to perform better financially, as seen through higher returns on assets and increased sales growth. The study also shows that larger firms and those with more foreign ownership tend to have better environmental performance.

[50] Martin, Michael, Ian David Williams, and Michael Clark. "Social, cultural and structural influences on household waste recycling: A case study." *Resources, Conservation and Recycling* 48.4 (2006): 357–395.

[51] Prasad, Mousami, and Trupti Mishra. "Low-carbon growth for Indian iron and steel sector: Exploring the role of voluntary environmental compliance." *Energy Policy* 100 (2017): 41–50.

[52] Yang, Xi, and Yang Yao. "Environmental compliance and firm performance: Evidence from China." *Oxford Bulletin of Economics and Statistics* 74.3 (2012): 397–424.

Incentives in Environmental Behavior

One of the most common and widely studied regulatory tools in literature is incentives.[53] In the context of environmental behavior, incentives are widely used across all domains related to the environment, such as energy, transportation, food consumption, and purchasing habits. As discussed in earlier chapters, the relationship between incentives and voluntary compliance is complex – while individuals aren't forced to behave in certain ways, the opportunity to earn bonuses creates external motivation rather than purely intrinsic compliance.

The effectiveness of incentives varies significantly by context. For example, plastic bag fees work not just through pricing mechanisms but also by raising awareness.[54] When consumers must actively choose to pay for plastic bags rather than receiving them by default, they're more likely to switch to reusable alternatives. This decision often becomes habitual, influencing behavior even before cost considerations come into play.

A detailed study of transportation behavior at the University of Michigan illustrates the nuanced role of different types of incentives.[55] The study examined efforts to encourage ridesharing among university employees through various incentives, including parking discounts for carpoolers, car rental options for those leaving vehicles off campus, safety-related passenger information, coordination agreements, designated pickup parking lots, and partner-finding meetings. A 2012 follow-up survey to an earlier 2009 study revealed that employees still traveled alone 80 percent of the time, with shared trips accounting for only 8.3 percent of travel. Significantly, the research found that nonfinancial incentives focused on improving travel comfort and coordination procedures had greater impact on increasing shared trips compared to financial incentives, which showed minimal effect. The availability of information and coordination tools proved particularly valuable in promoting carpooling behavior.

An interesting observation that emerges from many of the studies is that incentives cannot always be translated directly into a simple price function.[56] For example, travel costs were more important than other benefits. Benefits related to driving and parking time were also found to be very helpful. Another example of nontraditional environmental incentives can be observed in payments for environmental services,[57] an innovative approach to conservation increasingly used in both developed and developing countries.

[53] Stern, Paul C. "Information, incentives, and pro environmental consumer behavior." *Journal of Consumer Policy* 22.4 (1999): 461–478.

[54] Senturk, Gulsah, and Devrim Dumludag. "An evaluation of the effect of plastic bag fee on consumer behavior: Case of Turkey." *Waste Management* 120 (2021): 748–754.

[55] Kaplowitz, Stan A., and Arthur Slabosky. "Trying to increase carpooling at a major US university: A survey and an intervention." *Sustainability: The Journal of Record* 11.2 (2018): 74–80.

[56] Javid, Muhammad Ashraf, et al. "Travelers' attitudes toward carpooling in Lahore: Motives and constraints." *Journal of Modern Transportation* 25 (2017): 268–278.

[57] Wunder, Sven, Stefanie Engel, and Stefano Pagiola. "Taking stock: A comparative analysis of payments for environmental services programs in developed and developing countries." *Ecological Economics* 65.4 (2008): 834–852.

In addition, a comprehensive meta-analysis on the efficacy of incentives in environmental contexts summarized and compared the effects of incentives across many relevant domains.[58] The paper's overall conclusion is that incentives can be a valuable tool in promoting pro-environmental behaviors by contributing to sustained behavior change. The effectiveness of incentives varies by context and behavior type – for instance, noncash rewards prove more effective for promoting travel behavior changes, while cash rewards work better for encouraging recycling. The authors also found that incentive effectiveness depends significantly on the specific behavior being targeted. However, since this is a meta-analysis of existing studies, they acknowledge potential gaps in understanding, as some behaviors may have been easier to study than others. This research suggests that successful incentive programs need carefully calibrated distribution schedules tailored to specific environmental behaviors.

Negative versus Positive Incentives

In addition to the previously mentioned influence of incentives, it is evident that incentives impact not only through their price mechanism but also through their effect on various behavioral dimensions. This encourages individuals to comply with environmental regulations. The idea is not merely that, as most behavioral analyses suggest, people are less rational, but rather that consistently leading people to behave in a certain way requires a deeper understanding of how incentives shape their motivations for that behavior.

A paper examining the effect of changes in waste removal fees on recycling rates and waste production indicates that waste collection fees, which vary according to bin size, create economic incentives for households.[59] While higher prices have a limited impact on reducing nonrecyclable waste, they positively influence recycling rates. To improve waste management, it is important to consider both economic incentives and disposal options, with a focus on aligning pricing structures with environmental goals.

A New York experiment using quantity-based waste pricing demonstrated the significance of the accessible location of recycling bins in providing market incentives for waste.[60] The research examined individual recycling behavior and compliance with recycling laws, including legislative measures such as random trash inspections

[58] Maki, Alexander, et al. "Paying people to protect the environment: A meta-analysis of financial incentive interventions to promote pro-environmental behaviors." *Journal of Environmental Psychology* 47 (2016): 242–255.

[59] Hong, Seonghoon, and Richard M. Adams. "Household responses to price incentives for recycling: Some further evidence." *Land Economics* 75.4 (1999): 505–514. https://doi.org/10.2307/3147062.

[60] Reschovsky, James D., and Sarah E. Stone. "Market incentives to encourage household waste recycling: Paying for what you throw away." In *The economics of residential solid waste management*, edited by Thomas C. Kinnaman, Routledge, 2017: 233–252.

and weight limits on garbage bags that had been in place since the program's initiation in 1990. The findings reveal that recycling behavior is primarily driven by demographic factors – households with married residents and higher levels of education tend to have higher recycling rates. Physical factors like house size, waste storage capacity, and proximity to recycling centers also significantly influence recycling behavior. Notably, these demographic and structural factors appear more influential than financial incentives alone – the study suggests that implementing a waste-pricing policy in isolation may not significantly impact recycling rates. Instead, effective recycling programs are better achieved through a combination of legislation and convenient sidewalk waste collection systems that address these demographic and structural realities.

The Plastic Bag Tax Debate

An outstanding example of using incentives in an environmental context can be seen in the implementation of a plastic bag tax.[61] This tool is especially prevalent in the field of environmental regulation, with many approaches proposed to modify people's environmental behavior. In November 2016, the Chicago City Council repealed its ban on disposable plastic bags and replaced it with a seven-cent tax on disposable paper and plastic bags, effective February 1, 2017.[62] The City of Chicago collaborated with the behavioral design lab ideas, along with researchers from New York University and the University of Chicago Energy & Environment Lab, to conduct a joint study that tracked bag usage at major grocery chains in Chicago and surrounding suburbs before and after the implementation of the tax. Preliminary results from Chicago's bag tax study show significant changes in consumer behavior. After implementation, disposable bag usage dropped from over two bags per shopping trip to approximately one bag – a 40 percent reduction. Additionally, the percentage of customers using disposable bags decreased dramatically, falling from over 80 percent to less than 50 percent of shoppers. Notably, these financial incentives appear to foster habit formation, leading consumers to internalize more sustainable practices even beyond immediate cost considerations.

Public Perception of Environmental Regulatory Interventions

Beyond measuring the direct effects of environmental regulatory interventions, it is crucial to understand how public perceptions and responses to different approaches mediate their potential for fostering internalized behavioral change. Public attitudes

[61] Homonoff, Tatiana A. "Can small incentives have large effects? The impact of taxes versus bonuses on disposable bag use." *American Economic Journal: Economic Policy* 10.4 (2018): 177–210.

[62] Results are taken from: "The effects of the Chicago bag tax on disposable bag use." ideas42, November 2017. The report can be found on the ideas42 website at the following link: www.ideas42.org/wp-content/uploads/2018/09/Bag_Tax_Paper_final.pdf.

and willingness to cooperate significantly influence the effectiveness of various legal tools, including taxes, subsidies, and behavioral incentives. Several barriers can affect participation in environmental programs: uncertainty aversion, price-based procrastination, status quo bias, lack of trust in government or community members, and residential mobility concerns. Understanding these psychological, economic, and cultural factors is essential for designing effective environmental regulations.

Thus, the environmental phase introduces unique elements that set it apart from ethical, COVID-related, or tax-focused considerations. These factors require changes in behavior, even in areas unrelated to legal regulations. For example, transitioning to an electric car or adopting green energy requires a more extensive range of behavior modifications, where compulsion may not always be practical. This reality raises questions about the barriers to change in various countries. Understanding how various regulatory instruments impact public perceptions of alternative energy resources and whether public participation enhances or diminishes willingness to adopt these alternatives is crucial.

LACK OF CONSISTENCY IN ENVIRONMENTAL STUDIES

Our meta-analysis aims to elucidate the complex mechanisms underlying the relationship between regulatory approaches and internal motivations for environmental compliance. Specifically, we examine how different levels of trust embedded in regulatory tools affect individuals' intrinsic motivation to engage in environmentally friendly behaviors. By clarifying these interactions, we aim to contribute to the design of more effective and nuanced environmental policy frameworks.[63] Climate change and environmental degradation are critical global concerns that present challenges for regulators and policymakers. It is essential to have effective mitigation and adaptation strategies to tackle these challenges. However, their success is heavily dependent on public collaboration.[64] Governments frequently introduce external measures to strengthen compliance with environmental policies. The effectiveness of these interventions in influencing actual environmental compliance behavior has been the subject of extensive research.[65] However, there has been limited analysis of how such interventions impact pro-environmental motivation systematically. It is conceivable

[63] Slater, J., et al. "A meta-analysis of crowding effects on pro-environmental motivation." Working paper, 2024 (on file with author).

[64] Bryner, Gary. "Cooperative instruments and policy making: Assessing public participation in US environmental regulation." *European Environment* 11.1 (2001): 49–60.

[65] Some examples for meta analyses and systematic reviews are: Alt, Marius, et al. "Synergies of interventions to promote pro-environmental behaviors: A meta-analysis of experimental studies." *Global Environmental Change* 84 (2024): 1–13; Fontecha, John E., et al. "Scientists wanted? A literature review on incentive programs that promote pro-environmental consumer behavior: Energy, waste, and water." *Socio-Economic Planning Sciences* 82 (2022): 1–18; Osbaldiston, Richard, and John Paul Schott. "Environmental sustainability and behavioral science: Meta-analysis of pro-environmental behavior experiments." *Environment and Behavior* 44.2 (2012): 257–299; Świątkowski, Wojciech, et al.

that while external interventions might enhance behavioral adherence to pro-environmental policies, they could simultaneously undermine internal motivations. This potential backlash may lead to the "crowding out" of intrinsic incentives, which could create a long-term negative effect and result in noncompliance in the future.[66]

Corporations' versus Individuals' Environmental Compliance

It has been shown that incentives have the potential to improve environmental outcomes and provide economic benefits to stakeholders in the corporate context.[67] The effectiveness of these programs relies on their design, implementation, and monitoring. Further research has also supported the notion that there is a difference in the effectiveness of regulatory interventions based on the identity of the recipient, whether corporations or individuals.[68] For example, findings indicate that corporations may be more responsive to penalties than individuals. This is partially related to the famous s- versus i-frame paper,[69] where there is some criticism on the over focus on behavioral change by individuals.

The Importance of Corporation Size

Studies on corporate environmental compliance have shown that company size and social norms significantly influence compliance levels. Research indicates that larger companies tend to demonstrate better environmental behavior, with their compliance being particularly shaped by social norms and professional networks.[70] Similarly, with respect to voluntary environmental behavior,[71] a study focusing on large hotels revealed that larger corporations with greater resources were more likely to engage in pro-environment behaviors not mandated by law.

Research by Esty and Porter demonstrates that the structure of environmental regulations significantly influences a country's compliance rates.[72] Their analysis

"Interventions promoting pro-environmental behaviors in children: A meta-analysis and a research agenda." *Journal of Environmental Psychology* 96 (2024): 1–15.

66 Ling and Xu. "How and when financial incentives crowd out pro-environmental motivation."

67 Khanna, Madhu, and William Rose Q. Anton. "Corporate environmental management: Regulatory and market-based incentives." *Land Economics* 78.4 (2002): 539–558.

68 Chrun, Elizabeth, Nives Dolšak, and Aseem Prakash. "Corporate environmentalism: Motivations and mechanisms." *Annual Review of Environment and Resources* 41.1 (2016): 341–362.

69 Chater, Nick, and George Loewenstein. "The i-frame and the s-frame: How focusing on individual-level solutions has led behavioral public policy astray." *Behavioral and Brain Sciences* 46 (2023): 1–26.

70 Dasgupta, Hettige, and Wheeler. "What improves environmental compliance?"

71 Rivera, Jorge. "Institutional pressures and voluntary environmental behavior in developing countries: Evidence from the Costa Rican hotel industry." *Society and Natural Resources* 17.9 (2004): 779–797.

72 Esty, Daniel C., and Michael E. Porter. "Ranking national environmental regulation and performance: A leading indicator of future competitiveness?" The Global Competitiveness Report 2002 (2001): 78–100.

reveals substantial variations across nations – the Netherlands and Austria rank highest in environmental regulatory quality, followed by Denmark, while countries like Italy, Israel, and Greece rank lower. Two key factors emerge as crucial for compliance: information availability and enforcement by environmentally focused private sector entities. Building on these findings, additional comparative research has identified several factors that facilitate regulatory effectiveness.[73] Specifically, compliance monitoring becomes more manageable when there are fewer actors involved and when activities are concentrated in a small geographic area. Other significant factors influencing compliance include the economic value of the regulated activity, a nation's monitoring and regulatory capacity, and the organizational structure of the regulated activities.

Information vs. Incentives: Environmental Change

The literature has recognized the unique challenge of regulating individual behavior. Based on extensive reviews of various regulatory approaches, it is generally believed that information campaigns and the implementation of social norms are most effective in changing individuals' attitudes toward the environment.[74] This tendency can also be observed in people's attitudes toward electricity consumption and car purchasing. Research suggests that information campaigns promoting the adoption and proper operation of electrical vehicles can make a significant impact on individuals.[75] However, the measurement of the scope of these changes is still lacking.

In the context of corporate pollution, regulatory tools such as fines, taxes, and liabilities have proven quite effective.[76] However, when applied to individual behavior, the evidence is mixed and depends on various contextual factors. Interestingly, attitudes toward the environment did not appear to be highly predictive of financial decisions.[77] While individuals with strong pro-environmental attitudes were found to be more likely to engage in pro-environmental behavior, the connection between attitudes and actions proved weak. Research has indicated that personality traits, particularly "locus of control" – the perceived level of control people believe they have over the situation – can significantly influence an individual's sense of

[73] Weiss, Edith Brown, and Harold Karan Jacobson, eds. *Engaging countries: Strengthening compliance with international environmental accords*. MIT Press, 2000.

[74] Yamin, Paulius, et al. "Using social norms to change behavior and increase sustainability in the real world: A systematic review of the literature." *Sustainability* 11.20 (2019): 1–41.

[75] Wang, Shanyong, et al. "Policy implications for promoting the adoption of electric vehicles: Do consumer's knowledge, perceived risk and financial incentive policy matter?" *Transportation Research Part A: Policy and Practice* 117 (2018): 58–69.

[76] Faure, Michael. "Effectiveness of environmental law: What does the evidence tell us?" *William & Mary Environmental Law and Policy Review* 36 (2011): 293–336.

[77] Walczak, Damian, et al. "Attitudes and behaviors regarding environmental protection in the financial decisions of individual consumers." *Energies* 14.7 (2021): 1–13.

self-efficacy and willingness to engage in pro-environmental behavior.[78] Studies have also found that altruistic and environmental attitudes, combined with financial capacity (higher income and fewer household members), reliably predict pro-environmental behavior, such as participation in green electricity programs.[79]

SUMMARY AND CONCLUSION

In this chapter we focused on the third case study on environmental regulation, focusing on the distinctive challenges and methods involved in promoting compliance with environmental standards and encouraging positive changes in behavior. Compared to other areas of regulation, promoting environmentally responsible behavior often involves encouraging individuals and organizations to adopt specific values, stay mindful of their environmental impacts, and willingly bear costs, even when there are no legal mandates in place. Environmental behavior differs from tax compliance, discussed in Chapter 9 in a crucial way: While tax behavior simply involves following specific rules, environmental changes require broader shifts in consumption patterns and lifestyle choices. The chapter examines different regulatory tools, such as command-and-control methods, market-based mechanisms, and voluntary programs, and it highlights a recent trend toward more adaptable and inventive regulatory strategies.

We have attempted to synthesize research on the various intrinsic and extrinsic factors that influence both environmental compliance and pro-environmental behavior in different contexts. It explores how incentives, information campaigns, social norms, and cultural variations all play a crucial role in shaping people's environmental attitudes and actions. It also compares the compliance patterns of individuals and corporations when it comes to environmental policies. Moreover, the chapter examines the diverse cultural outlooks concerning environmental regulation. It emphasizes how distinct elements such as the level of faith in government, economic conditions, and cultural values can impact the triumph of environmental policies and programs in varying countries.

Future research should focus on further enhancing our comprehension of voluntary compliance and environmental regulation. Specifically, there is, first, a need to conduct longitudinal studies on the long-term effects of voluntary programs, as numerous studies have already assessed their short-term impacts. Future studies should monitor participating organizations and individuals for extended periods to

[78] Cleveland, Mark, Maria Kalamas, and Michel Laroche. "Shades of green: Linking environmental locus of control and pro-environmental behaviors." *Journal of Consumer Marketing* 22.4 (2005): 198–212.

[79] Kollmuss, Anja, and Julian Agyeman. "Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior?" *Environmental Education Research* 8.3 (2002): 239–260.

determine whether voluntary compliance results in lasting changes in behavior and improvements in the environment. Second, additional research is needed to fully comprehend the psychological and cognitive factors that affect decision-making related to the environment, both at an individual and organizational level. This involves exploring how the motivational aspects discussed thus far can be utilized to create voluntary compliance programs and regulatory interventions that are more efficient. Third, there is a need for more extensive cross-cultural studies to comprehend the influence of cultural factors on voluntary compliance and the efficacy of diverse regulatory strategies in different countries and regions. This research should aim to develop culturally sensitive frameworks for environmental regulation. Finally, although this research primarily focused on individual behavior, future research should investigate the correlation between voluntary environmental initiatives, corporate performance, and market dynamics. This includes investigating how consumer preferences, investor behavior, and competitive pressures influence corporate decisions to engage in voluntary environmental compliance. One of the challenges of promoting voluntary compliance is that governments may struggle to assess whether people are behaving voluntarily without jeopardizing the voluntary nature of the behavior. Consequently, we need better methods to measure and assess the environmental impact of voluntary compliance programs. We need to create advanced indicators and metrics that can effectively measure all the environmental impacts and benefits.

As discussed earlier, voluntary compliance cannot be achieved solely by relying on intrinsic motivation. Therefore, further research should investigate how mandatory regulations and voluntary initiatives can be effectively combined and work together in order to attain environmental objectives. This entails studying the potential for hybrid regulatory methods that combine the benefits of both mandatory and voluntary mechanisms. Addressing these research areas would help scholars and policymakers gain a better understanding of the interaction between environmental regulation and voluntary compliance, which will lead to more effective and sustainable environmental governance strategies.