



ENVIRONMENTAL SUSTAINABILITY AND COMPETITIVENESS: POLICY IMPERATIVE AND CORPORATE OPPORTUNITY

Daniel C. Esty and Steve Charnovitz

Environmental sustainability has emerged as an important element of corporate strategy and marketplace success.¹ Sustainability must also be recognized as a vital component of any country's competitiveness strategy. A focus on environmental sustainability—which entails a commitment to internalizing pollution externalities and managing natural resources for the long term rather than the short run—helps to eliminate waste, promote efficiency, and drive innovation.

For governments, sustainability requires a policy emphasis on sound science, careful risk assessment, rigorous benefit-cost analysis, greater transparency, and the use of appropriate economic instruments rather than “command and control” mandates to regulate environmental harms. For companies, bringing a sustainability lens to business strategy can help to reduce risks, lower costs, drive revenues, and build intangible value, especially brand loyalty—all of which contribute to competitive advantage.

¹See “The Sustainability Imperative,” *HBR* May 2010; Avery Fellow, “68 Percent of the World’s Largest Companies Strategize for Climate Change, Study Says,” *BNA Daily Report for Executives*, September 16, 2011 p. A-10.

Professor Esty is the Commissioner of the Connecticut Department of Energy and Environmental Protection (DEEP) and on leave from Yale University, where he is the Hillhouse Professor of Environmental Law and Policy. Professor Charnovitz teaches at George Washington University. The views expressed should be attributed to the authors only in their personal capacities.

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Our thesis is not that good environmental performance and a commitment to sustainability are alone sufficient to achieve competitiveness of an economy, sector, or company. Rather our point is that environmental sustainability often correlates with superior economic performance and competitiveness for both companies and countries.² We identify, from a theoretical perspective, a number of reasons that a commitment to sustainability and strong environmental results will likely enhance national as well as company-scale competitiveness.

The empirical association between environmental performance and national competitiveness has been demonstrated repeatedly.³ Of the ten highest ranked countries in the 2012 Environmental Performance Index, all 10 are in the top half of the World Economic Forum's Global Competitiveness Index 2012–2013, and seven are in the top quartile. Certainly, environmental performance provides only a partial explanation of national competitiveness. But it can be a significant part. When carried out in conjunction with other pro-efficiency policies, environmental stewardship can be a powerful contributor to sustained economic growth and long-term competitive strength.

The prospect that top-rank environmental performance correlates with national competitiveness should not be surprising because theory suggests several reasons why a commitment to sustainability, especially if translated into an appropriate structure of environmental law and policy, would generate benefits for national productivity and sustained economic success. Consider four such reasons.

First, in response to properly structured pollution control and natural resource management requirements, companies tend to adopt more eco-efficient, innovative practices that enhance industrial productivity by reducing inputs, eliminating scrap and waste, and improving energy efficiency.⁴ Evidence to support this line of argument can be found at the corporate as well as the national scale. Wal-Mart, for example, has driven down costs and reduced its environmental impacts by setting tough standards for its own operations and all its suppliers regarding waste, packaging, energy consumption, and greenhouse gas emissions. The goals applied across the company's value chain have pushed 60,000 suppliers to raise their game with a measurable impact on environmental

² See "Green Rankings 2010," *Newsweek*, Oct. 18, 2010, available at <http://www.thedailybeast.com/newsweek/2010/10/18/green-rankings-us-companies.html>; Yale Center for Environmental Law and Policy & Center for International Earth Science Information Network, Columbia University, *2012 Environmental Performance Index*, available at <http://epi.yale.edu>.

³ See, e.g., Daniel C. Esty, et al., *Pilot 2006 Environmental Performance Index*, New Haven: Yale Center for Environmental Law & Policy, available at www.yale.edu/epi/2006EPI_Report_Full.pdf; Daniel C. Esty, et al., *2008 Environmental Performance Index*, New Haven: Yale Center for Environmental Law & Policy, available at <http://epi.yale.edu:2008/>; Daniel C. Esty & Michael E. Porter, "National Environmental Performance Measurements and Determinants," in *World Economic Forum, Environmental Performance Measurement: The Global Report 2001-2002* (Daniel C. Esty and Peter Cornelius, eds.) pp. 24-44; Michael Greenstone, John A. List & Chad Syverson, "The Effects of Environmental Regulation on the Competitiveness of U.S. Manufacturing," *US Census Bureau Center for Economic Studies*, Paper No. CES-WP-11-03, 2011. The most recent Environmental Performance Index shows a significant correlation between environmental results and competitiveness—particularly with regard to indicators of "environmental health."

⁴ See Paul Lanoie, Jérémy Laurent-Lucchetti, Nick Johnstone & Stefan Ambec, "Environmental Policy, Innovation and Performance: New Insights on the Porter Hypothesis," *Journal of Economics & Management Strategy* (20), pp. 803–842, 2011.



performance and production efficiency not just in the United States, but also in China and other countries from which Wal-Mart sources goods. As Michael Porter has argued, it is just this sort of enhanced *resource productivity* from which modern-day competitive advantage derives.⁵

Second, well-designed environmental standards may induce companies to develop new ecologically-friendly products, production techniques, and services that reduce environmental impacts and resource consumption (advances in energy efficiency being of particular note in many business categories)—and that also offer superior value to those buying these goods and services. The companies creating new technologies or other market offerings often find that they can apply their breakthroughs not just to their own activities, but also to other companies and sectors. GE's push, for example, to produce more efficient jet engines has also propelled the company's success in bringing new materials and greater efficiency to the turbines that are the key to lower-cost wind power. Again, the potential for "innovation offsets" and dynamic competitive gain needs to be factored in to the benefit-cost calculus when looking at the logic of rigorous environmental regulations and other sustainability commitments.⁶

Third, some innovations add so much value that they jumpstart new business categories and provide a foundation for "blue ocean" competitive advantage and sometimes whole new industries.⁷ Think in this regard how the Toyota Prius has redefined the automobile and triggered a booming new world of electric mobility.⁸ More generally, the push in many jurisdictions for greater energy efficiency has led to "lean manufacturing," lower production costs, and more competitive industries. Japan's manufacturing success in the last several decades, despite high energy costs, represents the quintessential example of this sort of sustainability-induced competitive strength.

Fourth, better environmental law and policy implementation reduces human health costs from pollution exposure that would otherwise dampen productivity and output. One can imagine a scenario in which certain firms pollute heavily and are more profitable in the absence of strict environmental regulation, but whatever corporate gains are achieved would be false competitiveness because the benefits to the firm would come at the cost of a larger debit to the overall society. Indeed, as various economists, including Paul Krugman, have noted, some U.S. industries (such as coal-fired electricity) may be inflicting public health burdens and environmental damage that is higher than the sum of the wages and profits that such industries generate.⁹

In promoting better U.S. economic policy, policymakers should bear in mind the distinctions between competitiveness at the firm and at the country level and the relationships between them. If U.S. firms compete successfully in world trade only by degrading the environment, inflicting pollution-related public health costs on others, depleting natural resources, or otherwise

⁵ Porter and van der Linde, "Towards a New Conception of Environment-Competitiveness Relationship," *Journal of Economic Perspectives* (9), pp. 97–118 (1995); Daniel C. Esty & Michael E. Porter, *Journal of Industrial Ecology* (2), pp. 35–43, 1998.

⁶ Michael E. Porter, "America's Green Strategy," *Scientific American* (264), p. 168, 1991.

⁷ W. Chan Kim & Renée Mauborgne, *Blue Ocean Strategy*, Boston: Harvard Business Press, 2005.

⁸ *Popular Mechanics*, Oct. 2009.

⁹ Paul Krugman, "Party of Pollution," *New York Times*, Oct. 21, 2011, p. A29.



diminishing the living standards of current and future Americans, that is not true competitiveness for a nation. So it is critical that investments in environmental advances and sustainability be analyzed with the full stream of benefits calculated alongside the costs.

Governments should furthermore avoid falling for the now discredited idea that a commitment to environmental protection inevitably entails an economic burden for the economy. Development theory from the 1970s suggested that nations face a zero sum tradeoff between efforts to improve environmental conditions and efforts to gain more national economic growth. While some environmental policies have been implemented in inefficient ways or driven beyond the point of diminishing returns, those who pursue sustainability in a thoughtful fashion need not worry about such counterproductive results. Indeed, at the core of our policy recommendations are commitments to careful risk and economic analyses designed to ensure that policies are never pushed beyond the point where costs exceed benefits.

In pointing out that environmental protection and competitiveness can be synergistic, we do not mean to suggest that the environmental regulatory choices facing U.S. policymakers are easy or irrelevant to the competitiveness of particular industries or companies. Certainly, governmental decisions on the stringency of environmental standards or the modalities of environmental regulation can affect the profits of particular companies and industries and can make them less competitive in world trade, particularly when other major economies regulate less strenuously (or more efficiently).¹⁰ In pointing out that policymakers should not be fixated on an imaginary environment/competitiveness tradeoff, we mean to say both that environmental regulation done right need not be a burden to industry or the economy as a whole and that a failure to adopt appropriate policy instruments to internalize externalities and promote sustainability can result in faulty market price signals that translate into lower productivity, slower growth, environmental degradation, and diminished social welfare.

To be sure, we would not argue that stringent environmental regulations necessarily enhance national competitiveness. Such a thesis would sometimes be false. Rather, our claim is that when environmental regulation is carefully designed to solve genuine ecological problems using efficient policy instruments (what we call “optimal environmental policy”¹¹), it will not significantly detract from national competitiveness and should instead tend to enhance it. By optimal environmental policy, we include not only the measures that directly regulate pollution and the use of natural resources, but also proper attention to efficiency and sustainability-enhancing choices in other policy realms such as agriculture, housing, and transportation.

The enlightened debate today is not about the importance of good environmental performance. Rather, the debate is about how to address scientific uncertainties, pay for environmental public investments, set reasonable timetables for the implementation of new requirements, factor in (and

¹⁰ On the other hand, industries facing the possibility of higher environmental regulation tend to overestimate compliance costs and competitiveness burdens. Once an industry is given a firm environmental performance standard to meet with a time certain for compliance, the most innovative companies will often find much more efficient way to meet the targets than had been previously expected. See Richard D. Morgenstern, et al., “On the Accuracy of Regulatory Cost Estimates,” Resources for the Future, Discussion Paper 99-18, 1999.

¹¹ Daniel C. Esty, “Toward Optimal Environmental Governance,” *N.Y.U. L. Rev.* (74), pp. 1495-1574, 1999.



promote) the possibilities of future technology breakthroughs, choose the best policy instruments, and address the genuine “level playing field” concerns that arise when major trading partners regulate less stringently. Of course, if some countries subsidize production of particular goods—as China is now supporting makers of wind turbines and solar panels—their trade partners face a quandary.¹² They can attack the subsidies as an unfair trade practice and thereby forgo the benefits of low-price imports, or they can try to match the subsidies in order to keep their domestic producers competitive and thereby also possibly engage in an unfair trade practice. Thus, optimal environmental policies are easier to specify in theory than practice.

This essay proceeds in the following manner: Part I defines seven principles for optimal U.S. environmental policy—all of which additionally enhance competitiveness. Part II discusses why a sustainability focus at the level of corporate strategy can strengthen a company’s competitive position. Part III highlights a set of potential federal policy initiatives that would advance competitiveness as well as environmental results. Throughout this essay, we emphasize that environmental awareness and sustainability should pervade a smart approach to competitiveness—and that attention to efficiency and the other elements of optimal environmental policy will be needed to undergird a successful competitiveness strategy.

I. PRINCIPLES FOR OPTIMAL ENVIRONMENTAL POLICY

The **first principle** of environmental policy is that it should be driven by science and data, and a commitment to analytic rigor. This is not to suggest that politics can ever be absent from environmental decisionmaking. Elected officials have a central role in making key choices concerning goals, timetables, and the distribution of the benefits and burdens of governmental interventions. Rather, our point is that policymakers should have access to high-quality, independent scientific input and base their decisions (and be seen as basing their decisions) on rigorous analysis of the evidence before them.¹³

New regulations or environmental charges should not be pursued unless the long-term benefits of the proposed action exceed the costs. Too often in the past this fundamental principle has been ignored. For example, with regard to national ambient air quality standards, the Congress does not allow the U.S. Environmental Protection Agency (EPA) to consider private sector implementation costs. Without such a governing principle, environmental policy can be an unnecessary drag on the economy, lessen prosperity, and diminish competitiveness.

In general, the data used and the analysis of it should be made public and be readily accessible on appropriate websites. Interested parties should be invited to look for flaws or gaps in the data or analysis, or take issue with the assumptions on which the analysis is based. When policies derive from statistical analysis, the methodologies employed should be fully explained, and subject to peer review and statistical cross-checks (such as sensitivity analysis).

¹² Keith Bradsher, “Trade War in Solar Takes Shape,” *New York Times*, Nov. 10, 2011, p. B1.

¹³ Indeed, as greater computer power and other information technologies become available, the “possibility frontier” for rigorous analysis extends ever farther.

The **second principle** is that environmental policies should, to the greatest extent possible, be clear and comprehensible. For environmental taxes and regulations to achieve the desired benefits, predictability is essential. Put another way, a more certain policy, even when imperfect, is to be preferred to a start/stop pattern that engenders uncertainty. The best illustration of this is the way that U.S. climate policy has been adrift in the two decades since United States ratified the Climate Change Convention in 1992. In the absence of any predictable framework for greenhouse gas (GHG) emissions pricing, American companies have been seriously hampered in making rational decisions concerning energy investments. This uncertainty has dampened innovation and put U.S. companies at a serious disadvantage in competing with companies in other countries with less chaotic policies. Indeed, one could go as far as to say that indecision and inaction in climate policy has cast a pall over the entire U.S. economy by creating uncertainty for producers, service providers, builders, and consumers. A recent report by HSBC has called the United States the “one significant outlier” in the world’s move toward policies that reduce greenhouse-gas emissions.¹⁴ Our colleague Bill Sahlman has aptly characterized the absence of a predictable framework for carbon pricing as an “uncertainty tax.”

The **third principle** is that policymakers should seek to use economic incentives and other market-based policy instruments rather than “command and control” mandates. Many environmental problems arise from market failures, and so the optimal response will often be a policy that internalizes externalities or otherwise uses price signals to shape the behavior of resource users and to value ecosystem services. To do so, governments can impose taxes or charges, regulate performance, use tradable permits, and require information disclosure to inform consumer choice. Regulators should not resort to command and control techniques that dictate specific outcomes or technologies unless it proves impossible to use market-based regulatory instruments.

Because many aspects of environmental quality are public goods (e.g., clean air, stable temperatures) which the market cannot be expected to adequately supply, there can be a valid role for the government to make investments in new public infrastructure and in scientific and technological research. Federal tax credits and accelerated depreciation for the private sector are appropriate for incentivizing private investments in new technology. Government-funded prizes (such as the X-prize) can also be employed strategically to solve especially knotty environmental challenges, such as better and safer energy storage. In addition, there is a role for more partnerships among business, nongovernmental organizations (NGOs), and governments to support eco-innovation.¹⁵

In designing and utilizing economic instruments, policymakers should take into account the entire life cycle. All too often, environmental or energy programs are put in place without full consideration of the upstream and downstream consequences. For example, the production stimulated by longtime federal corn ethanol subsidies had a net negative impact on the environment (e.g., through upfront energy costs and by destroying wetlands and overusing pesticides) and raised the price of corn, creating a harmful food-fuel tradeoff.

¹⁴ January 2011. Elisabeth Rosenthal, “Where Did Global Warming Go?,” *New York Times*, Oct. 16, 2011, p. SR-1.

¹⁵ OECD, *Better Policies to Support Eco-innovation*, Washington, D.C.: *OECD Publishing*, 2011, pp. 241-300.

The **fourth principle** is that environmental policy should be made in a transparent manner that is open to public scrutiny, participation, and dialogue. The enactment by the U.S. House of Representatives of the American Clean Energy and Security Act in June 2009 provides a sad example of a process that failed to meet this standard. In that episode, the House took up a 1,423-page climate bill finalized only 14 hours earlier and did so without public hearings, sufficient time for floor debate, and publicly available documentation. We recall the political imperative at the time to rush this momentous bill through the U.S. House of Representatives on a close vote, but since the bill was never taken up in the Senate, it seems clear in retrospect (and to many observers at the time) that ramming the climate bill through the House did not advance public support and understanding of a vital climate initiative, but rather undermined it.

The **fifth principle** is that because ecosystems are not confined to national borders, U.S. environmental policy has an important international dimension. Simply put, good environmental results will often require the cooperation of other countries. The paradigmatic example of an environmental policy requiring international cooperation is climate change, but many other issues (for example, sustainable fisheries) share the need for transnational cooperative solutions.

To achieve the necessary degree of international collaboration, U.S. leadership will be useful if not essential. Other countries look to the United States to be a central player in international negotiations and institutions. So when the United States sits on the sidelines, the odds of establishing a coordinated global policy drop considerably. Similarly, when the United States fails to join widely-accepted multilateral treaties such as Biodiversity Convention, the Basel Convention on Hazardous Waste exports, the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on Trade in Hazardous Chemicals and Pesticides, and the Law of the Sea, our ability to influence the direction of those regimes and to protect U.S. economic interests diminishes.

The **sixth principle** is that environmental and economic goals should be aligned—and recognized as interdependent. Although having well-designed environmental policies that achieve ecological and health objectives at an acceptable cost would be a sufficient ambition for many countries, we believe the U.S. economy should strive for environmental policies that contribute positively to economic growth, job creation, and competitiveness. Indeed, the large size of the U.S. economy and the diverse environmental challenges we face (including ecosystem restoration) provide a marketplace opportunity at a sufficient scale to attract venture capital and other investments, thus enabling U.S. producers of environmental goods and services to create innovations that can be sold or licensed throughout the world. Thus, we see a national commitment to cutting-edge environmental policies and leadership on clean energy as fundamental to positioning U.S. companies for success in the development of cleantech and alternative energy breakthroughs that can become a substantial engine of economic growth in the years ahead.

The **seventh principle** is that it will be hard to achieve optimal environmental policy at a time when the economy is in recession or is performing poorly in output, productivity, and job creation—largely because of the tendency in such circumstances to focus on the short term. As evidence for this proposition we point to recent policy actions by the Congress with regard to environmental regulations, including the November 2011 attempt to overturn EPA's Cross State Air Pollution Rule, despite very substantial positive net benefits. We also see instances where the Executive Branch has



postponed pending environmental rules, such as the Obama Administration's recent retreat from proposed new ozone regulations—delayed because the weak economy made forward progress politically difficult.¹⁶ Thus, not only does competitive success depend on a commitment to sustainability, but simultaneously, ongoing dedication to sustainability requires competitive strength that provides a foundation for public confidence in future economic conditions.

America's prospects for both a competitive and sustainable future have been compromised by the absence over the past decade of a coherent economic growth strategy. We stress that the "ecology of competitiveness" depends on a clear recognition of the interconnectedness of policies and the systematic pursuit of synergies that can be achieved when the full range of policy instruments are integrated to advance the economy.¹⁷ This interdependence is especially important to attend to because so many of the key issue areas in a national competitiveness agenda—such as public infrastructure, energy security, trade, immigration, and education and training—have important environmental dimensions.

Although this essay focuses on how to promote environmental sustainability without undermining competitiveness, we would note that the paradigm of sustainability, which originated in the environment regime, has important implications for choices in other key policy areas. All too often, policymakers have chosen options that have a short-term political logic, but that fail the test of long-term sustainability. The most obvious pathologies occur in federal budgeting (e.g., clean energy tax credits that come and go as well as the perennially expiring research and experimentation tax credit), health care, and agricultural subsidies, to name a few.

II. LESSONS FOR BUSINESS

The need to move beyond the environmental progress versus economic success tradeoff paradigm holds true in the domain of corporate strategy as well as economic development theory. Until recently many corporate leaders viewed the environment as a burden imposing regulations to follow, risks to manage, and costs to bear. Today, leading-edge CEOs and their management teams recognize that environmental issues and broader sustainability challenges can be a source of competitive eco-advantage.¹⁸ Indeed, a recent study found that 95% of the world's 250 largest companies regularly report on their environmental performance—highlighting their commitment to sustainability as an indicator of prospective marketplace success.¹⁹

Companies that have invested in energy conservation or other aspects of "eco-efficiency" have often seen substantial paybacks in the form of *reduced costs*. GE estimates that its "treasure hunts" in

¹⁶ Neela Banerjee & Don Lee, "Job Report Raises Stakes for Obama; The president withdraws proposed clean-air rules in the face of flat growth for the month of August," *Los Angeles Times*, Sept. 3, 2011, p. 1.

¹⁷ Steve Charnovitz, "Competitiveness, Harmonization and the Global Economy," in *Agriculture, Trade and the Environment: Discovering and Measuring the Critical Linkages* (Maury E. Bredahl et al. eds., Westview Press, 1996).

¹⁸ Daniel C. Esty & Andrew S. Winston, *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage*, 2009, pp. 7-30.

¹⁹ Avery Fellow, "Sustainability Reporting Evolves to Include More Water Risk, Supply Chain Disclosures," BNA Daily Report for Executives, Nov. 9, 2011, p. C-1.



this regard have unveiled 5000 distinct opportunities for efficiency improvements—yielding more than \$100 million per year in operating cost reductions while reducing greenhouse gas emissions by nearly a million metric tons per year.²⁰ Taking out costs has a direct impact on competitiveness and profitability. As CEO Jeff Immelt likes to say, “Green is green.”

A focus on sustainability can also help to mitigate risks that translate into costs. Companies that have found ways to eliminate toxic chemicals from their production processes or products have seen their operating costs drop. The cost savings can be both direct as these chemicals are often expensive, and indirect as they trim the regulatory paperwork required for the use of toxic chemicals and the product stewardship costs (e.g., more expensive end-of-life disposal burdens) associated with managing products containing toxics. Likewise, insurance costs and safety investments may also be reduced.

With this logic in mind, SC Johnson now subjects all of its products to an internal review process designed to eliminate (where possible) ingredients that have toxicity or non-degradability issues. This “Greenlist” review has resulted in the reformulation of dozens of products from Windex to Drano in ways that have cut costs and improved the company’s competitive position.

Perhaps the most dramatic paybacks to a focus on sustainability as an element of corporate strategy have come to those companies that have used a “green lens” to drive revenue growth.²¹ Dow, for example, has adopted a sweeping set of 2015 Sustainability Goals designed to reposition the company in a number of new markets from advanced materials to biofuels. CEO Andrew Liveris attributes more than \$5 billion in new sales to the markets these goals led the company to enter.²² Similarly, GE’s “ecomagination” campaign has translated into tens of billions of dollars of sales growth across a range of sustainability-related product lines from more efficient jet engines to wind power to new technologies that make drinking water safer. Fundamentally, companies that look for ways to solve their customers’ environmental or energy use challenges often find themselves with substantial marketplace opportunities and new angles for competitive advantage.

Finally, a growing number of companies are investing in sustainability initiatives as a way to enhance their brand or otherwise *drive intangible dimensions of market value*. Coca-Cola, for instance, has committed hundreds of millions of dollars to water projects around the world as a way to demonstrate its commitment not just to reducing its own corporate environmental footprint, but also to helping the communities it operates in to address their own sustainability challenges. The payback comes not only in the form of consumer’s attachment to the brand, but also in terms of easier recruitment and retention of top employees and better relations with community leaders, consumer advocates, and environmental NGOs.

Unilever has similarly invested millions of pounds, euros, and dollars in its “sustainable living plan” designed to promote the company as a green leader—and a trusted brand. CEO Paul Polman makes no bones about the fact that this investment is not aimed merely at corporate social

²⁰ Daniel C. Esty & P.J. Simmons, *The Green to Gold Business Playbook*, Hoboken, NJ: Wiley, 2011, p. 223.

²¹ Sarah Murray, “Industry searches for clean break from past,” *Financial Times*, Oct. 31, 2011, Special Report, p. 1.

²² Esty & Simmons, *ibid.*, p. 53.



responsibility, but also at competitive positioning in a world where branded products have taken on added importance as a signal of quality and reliability.

Thus companies, perhaps more than governments, have come to recognize the important sustainability-competitiveness link. Many companies are voluntarily reporting their GHG emissions using standardized accounting for Scope 1 (direct), Scope 2 (indirect energy), and Scope 3 (value chain). The lessons that so many corporate leaders have learned about the value of the green lens as an element of day-to-day business strategy has important implications for governments as they construct competitiveness policies. We therefore see the “sustainability imperative” as not just a business megatrend, but also as a foundation for national economic success in the years ahead.

III. POLICY RECOMMENDATIONS ON ENERGY AND THE ENVIRONMENT

A. Energy Security and Sustainability

The U.S. economy is expected to need increasing supplies of energy in the years ahead even with advances in efficiency. Such energy should be secure in the sense of availability and stable cost, but also secure in the sense of environmental impact. Below we offer six specific recommendations for the United States:

1. Energy security can best be achieved by broadening America’s portfolio of energy sources and setting national goals for ongoing expansion in the share of domestic renewables. An expanded commitment to energy efficiency as well as broader use of natural gas and safe nuclear energy would also help advance the goals of more reliable, cleaner, and cheaper energy. Many states have already taken the lead in developing their own clean energy portfolio standards, and this experience will be valuable in formulating national goals.
2. The idea of a North American energy space continues to have salience, and policymakers should make serious efforts to build upon this dimension of the North American Free Trade Agreement (NAFTA). The proposals for new Arctic Ocean oil drilling and the Keystone XL Pipeline have clear benefits, and more work is needed to think through the significant environmental implications. When new large-scale fossil-fuel energy projects are proposed, they should be evaluated as if an appropriate carbon tax were in place that would fully internalize environmental costs of such projects.
3. Federal energy policy should favor greater use of natural gas, which is today both cleaner and cheaper than coal and oil as a result of recent drilling technology breakthroughs that have lowered the cost of exploiting the Marcellus Shale and other shale gas reserves.²³ Natural gas could therefore become the preferred fossil fuel for new power generation, home heating, and transportation fuels (supporting both expanded use of compressed natural gas and electric vehicles). Of course, regulations addressing the full range of environmental

²³ James J. Mulva, “Natural Gas Can Put Americans Back to Work,” *Wall Street Journal*, Oct. 26, 2011, p. A13.



concerns about shale gas and hydraulic fracturing need to be in place before new development of America's natural gas resources proceeds.²⁴

4. Reforms in electricity infrastructure, the business model of our utilities, and energy market access will be important to making renewable power more viable. The biggest challenge is the old model of public utility regulation that discourages alternative power production in general and distributed generation in particular. Moreover, the lack of adequate transmission capacity to move renewable power from where it is generated to where it is needed should be better addressed—as noted recently by the President's Council on Jobs and Competitiveness.²⁵

Access to the electrical grid for new renewable sources of power represents another obstacle to a competitiveness-enhancing electricity infrastructure. Solving this issue might require expansions in the grid as well as regulatory changes to oversee a greater commoditization of electricity.²⁶

Another problem with electricity transmission is the vulnerability of above-ground power lines to storms that interrupt access to electricity. We recommend initiation of federal demonstration projects to test the cost-effectiveness of a major infrastructure investment that would put electric wires underground and at the same time replace aging water pipes, separate storm run-off drains from sewer systems, install fiber optic cable for high-speed broadband internet service, and extend natural gas mains where they are nearby. While costly, such investments could provide a stimulus to economic growth and a foundation for competitive strength over time.

5. In light of the challenge of securing the adoption of an economy-wide cap-and-trade approach to climate change, the time has come to move forward with a simpler (though perhaps equally politically difficult) plan of imposing a federal charge on GHG emissions from energy producers. This charge ought to be levied at the first point of sale of a fossil fuel. In other words, coal, oil, and gas companies would pay on the basis of the carbon content of the fuel they deliver. Such a charge would partially internalize environmental costs, drive investment in energy efficiency, and encourage innovation in renewable electric power (from sources including advanced biofuels; hydropower; and wind, solar, and geothermal power) and in carbon capture and storage. More immediately, it would induce companies to reduce waste and inefficiency and create products that do the same.

Specifically, we propose a charge of \$5 per ton of carbon emissions, beginning after the economy has recovered (perhaps in 2014) and rising by \$5 a year to a maximum of \$100 per

²⁴ Fred Krupp, "The Smart Path for the Shale Gas Revolution," *Wall Street Journal*, Aug. 18, 2011, p. A-15.

²⁵ Jobs Council, *Taking Action, Building Confidence, Interim Report*, October 2011, p. 14. See also Michael B. McElroy, "Time to Electrify," *Harvard Magazine*, July/August 2011, pp. 36–39.

²⁶ See Felix Mormann, "Requirements for a Renewables Revolution," *Ecology Law Quarterly* (38), forthcoming 2011.



ton.²⁷ The European Union's cap-and-trade approach to greenhouse gas emissions translates to a charge of about \$10 per ton (the figure has been as high as \$40 in recent years). Australia recently enacted a charge of \$23 per ton. Even China has announced plans for pricing carbon emissions. A slow but steady escalation from a very low base would minimize the initial economic burden while changing investment behavior immediately in the right direction. Companies that have made capital decisions on the basis of prior assumptions about energy costs would have time to adjust, and those planning new buildings, factories, and other energy-related investments could optimize their choices.

The logic for a U.S. carbon charge goes beyond pollution control. Even a modest charge would raise substantial revenues -- about \$28 billion in the first year, and about \$250 billion a year after a decade -- and could help reduce the national debt while avoiding many of the negative consequences of taxing individual or corporate incomes. Moreover, a carbon charge would help to wean the country off imported oil and reduce the trade imbalance.

We recognize that a carbon charge would increase energy costs for some companies in the short term, but we're convinced that the benefits over time to the nation's economy and competitiveness would clearly outweigh those costs. To avoid even short-term impacts on competitiveness, we propose holding off on actually imposing such a charge until other major economies, including China and India, have enacted broadly comparable policies. We are convinced that if the United States provides leadership in passing carbon-charge legislation, other countries will follow suit, making reduced global emissions a realistic goal in the next round of climate-change negotiations.

6. Government subsidies in the energy arena need to be redirected. Direct support for specific companies or technologies should be ended as the government's record in picking winners has not been good. At the same time, we believe that federal funding for fundamental research in clean energy needs to be substantially increased as recommended by a 34 Nobel laureates to President Obama in 2009. Compared to competitors such as China, France, Japan, Korea, the U.S. government spends the smallest fraction of its GDP on energy research and development. The locus of such federal funding should be in universities, national labs, and under the U.S. Department of Energy's new Advanced Research Project Agency–Energy (ARPA-E).²⁸

We are far more skeptical of federal grants, loans, and loan guarantees to energy businesses to push out new technologies. Our concern with the Solyndra episode is not just that the federal money was wasted, but also that we do not believe that the Energy Department is institutionally qualified to act as a venture capitalist. Of course, if there is truly a problem that private financing for good investments in clean energy is not readily available, then we would suggest creation of an independent corporation that would not be part of the Energy Department. We note that Australia has recently created a Clean Energy Finance

²⁷ Our proposal is based on Daniel C. Esty & Michael E. Porter, "Pain at the Pump? We Need More," *New York Times*, Apr. 28, 2011, p. 25.

²⁸ See David G. Victor & Kassia Yanosek, "The Crisis in Clean Energy," *Foreign Affairs*, July/August 2011, pp. 113–120.



Corporation, and the State of Connecticut has established a Green Bank to leverage private capital to support both energy efficiency and renewable power generation.

B. Environmental Protection and Competitiveness

Environmental governance in the United States is almost too complex to model with numerous entities playing central roles including several federal agencies, the White House, a jumble of Congressional committees, the courts, and state, regional, and local governments. Much could be done to improve the process of environmental policymaking—and perhaps the time is right for a complete overhaul of U.S. environmental law moving away from “command and control” regulations toward a structure based on economic incentives. But in this short essay, we offer a more modest set of recommendations at the interface of environmental protection and competitiveness.

7. EPA was a path-breaking agency when it was established in 1970, and now over 40 years later, the Agency is due for a retrofit. In 2011, a distinguished panel assembled by the National Research Council issued a comprehensive report offering a new framework for incorporating sustainability into the EPA’s principles and decisionmaking.²⁹ We would welcome greater attention to this Report by the Administration, Congress, and private sector, and greater consideration of sector-based, multi-pollutant analyses. We also recommend that EPA establish a National Advisory Committee on Competitiveness and Environmental Sustainability—building on EPA’s foundational work at the environment-competitiveness nexus done in the early 1990s.
8. Foreign environmental standards, both governmental and private, can sometimes be a significant trade barrier. Recognizing that there are provisions in a number of international trade agreements calling for the harmonization of standards, we would like to see U.S. officials do more to work with foreign officials to defend U.S. commercial and environmental interests, ensuring in particular that foreign standard-setting practices do not become a source of U.S. competitive disadvantage. We also see a need for greater coordination of the myriad public and private standard-setting initiatives in the United States and a need to assure adequate U.S. private sector participation in international standards meetings, such as at the ISO.³⁰
9. To help reduce the federal deficit and promote more sustainable consumption, the Congress should “sunset” all economically perverse subsidies and related protectionist barriers (particularly agricultural subsidies that tend to promote non-sustainable farming practices as well as disrupting trade relations), and re-enact them only if they have unequivocal economic and environmental justifications. In particular, we recommend a zero-based review of subsidies for fossil fuels, agricultural production, water, flood insurance, and others.
10. One cause of the job creation funk in the United States has been the lack of forward progress on trade liberalization during the past several years. Indeed, since 2007, the President has

²⁹ National Research Council, *Sustainability and the U.S. EPA*, 2011.

³⁰ See 19 USC §2543 (Representation of United States interests before international standards organizations).



lacked fast-track, trade promotion authority. Although we welcomed the long-delayed transmittal by President Obama of the free trade agreements with Colombia, Panama, and South Korea, followed by swift Congressional approval, we do not see much of a plan by the Administration for consummating the now decade-long Doha negotiating round of the World Trade Organization (WTO). The Doha Round has a significant environmental dimension as it includes liberalization of environmental goods and services and a framework for reducing unsustainable fishery subsidies.

We recommend renewal of Presidential trade negotiating authority by the Congress and stronger efforts by the Administration to complete the WTO round or at least rescue the environmental dimension for an early harvest. We also favor multilateral negotiations on a code for energy subsidies to provide more certainty and avoid trade conflicts as governments impose trade barriers in the name of climate change.³¹ Although the new U.S. free trade agreements (Korea, Colombia, and Panama) include an environment chapter written several years ago, there is now a need to update the model environment chapter in ongoing trade negotiations, such as the Trans-Pacific Partnership (TPP).

CONCLUSION

Sustainability offers an important overarching goal for environmental policy, which, if translated efficiently and effectively into law and regulations, would also enhance both company-scale and national competitiveness. A better competitiveness strategy that enhances U.S. economic strength would likewise provide the underpinnings for economic growth and broad-based prosperity that make commitments to environmental protection easier to sustain. It is time that the sustainability-competitiveness link be recognized and developed as a matter of policy priority and corporate opportunity.

³¹ Gary Clyde Hufbauer, Steve Charnovitz & Jisun Kim, *Global Warming and the World Trading System*, Washington, DC: Peterson Institute for International Economics, 2009, pp. 99–110.

