

Chapter 1: THE LOW-CARBON ECONOMY

BACKGROUND¹

- Responding to climate change is one of the largest market opportunities the world has seen. According to the [International Energy Agency](#) (IEA), \$20 trillion will be invested to meet the world's energy demand between 2005 and 2030, half of it in developing countries. IEA estimates \$2.4 trillion must be spent on more efficient refrigerators, cars and other energy-consuming devices. If these investments are not made in a climate-friendly way, emissions of greenhouse gases may be 50 percent higher by 2050.
- In 2007, British economist [Lord Nicholas Stern](#) called global climate change the “greatest example of market failure we have ever seen.” He estimated that deep cuts in greenhouse gas emissions sufficient to stabilize the climate would cost 1 percent of global GDP by 2050. A year later, Lord Stern doubled his estimate, contending that a more ambitious emissions-reduction target is now necessary.
- The [McKinsey Global Institute](#) concludes that to achieve necessary reductions in carbon emissions while maintaining economic growth, the world needs a “carbon revolution” comparable to the transformation that took place during the Industrial Revolution – but in one-third the time. Costs are manageable and the necessary technologies exist, the consulting firm reports. It estimates that a sufficient “carbon revolution” will require international investment of 0.6 to 1.4 percent of global GDP by 2030, compared to the 3.3 percent of global GDP spent on insurance in 2005.
- McKinsey estimates that a [global investment of \\$170 billion annually](#) from now until 2020 would halve the growth in world energy demand, achieve half the carbon reductions needed to avoid the worst consequences of climate change and generate an average internal return rate of 17 percent.
- Investments are moving in the right direction. The United Nations (U.N.) reports “[a gold rush of new investment into renewable power.](#)” Capital investment in renewable energy increased 60 percent from 2006 to 2007, with the European Union leading the way.
- The U.N. estimates that investments in renewable energy will reach \$450 billion a year between now and 2012, and will reach more than \$600 billion a year from 2020 to 2030.
- Renewable energy is already creating jobs in the U.S. economy. For example, GE Energy Financial Services reports that wind farms created 17,000 construction-related jobs and 1,600 long-term jobs last year. The Danish wind company Vestas is building plants that will employ 2,500 people in Colorado to manufacture blades and towers for wind turbines. Wind power has created 1,000 new jobs in Nolan County, Texas, and is expected to produce \$315 million in revenues.
- Renewable energy is also creating income for governments. GE Energy Financial Services estimates the wind projects that went on line last year are generating \$6 million annually in local property taxes, \$15 million annually in state income taxes and \$250 million in net present-value benefits to the U.S. Treasury.
- An [analysis](#) by the Center for American Progress and the Political Economy Research Institute at the University of Massachusetts concludes that a green-technology investment of \$100 billion over the next two years in the U.S. would create 2 million good jobs, three times more than a similar investment in the oil industry. (See Action 9 below.)

FRAMEWORK FOR FEDERAL POLICY

- At least four elements are needed and should be supported by federal policy to make a successful transition to a green economy: a) unambiguous market signals; b) public investment in emerging technologies; c) the elimination of perverse incentives and the addition of carbon pricing in the marketplace; and d) private innovation and investment.
- The federal government should begin a gradual disinvestment in the carbon economy. Existing public assistance such as federal loan and loan guarantee programs should be used and redirected as necessary to support the transition to a low-carbon economy. Federal funds should be used to leverage and accelerate private investment in the low-carbon economy.
- The United States should strive aggressively to win back its lead in manufacturing renewable energy systems and low-carbon products for the emerging global market. (Solar and wind energy technologies were developed in the United States but we have given up our lead to nations such as Germany, Denmark and Japan.)
- Federal policy should encourage full disclosure of a new class of risks for publicly traded companies, including energy price and supply volatility, peak oil, anticipated impacts of climate change and carbon pricing.

EXECUTIVE ACTIONS

1. Engage the nation in a conversation about the post-carbon future. Using state-of-the-art [telecommunication and computer technologies](#), conduct **National Town Hall Meetings** to discuss and visualize what homes, workplaces, vehicles and communities might be like in a post-carbon economy. Solicit public preferences, ideas and priorities. Build a sense of participation and ownership among the American people on charting a path for economic transformation.
2. During the transition, create an **Energy Security and Climate Stabilization Board** consisting of America's top academic, financial, corporate, non-profit and government leaders, and charge it with framing a roadmap to the new economy. After inauguration, constitute the board officially. The board – a cross between President Roosevelt's War Production Board and President Clinton's President's Council on Sustainable Development – should recommend market mechanisms, regulatory reform, trade policies and barrier-busting initiatives that will unleash economic transformation.
3. Strengthen the goals of the Federal Energy Management Program to stimulate markets for green energy and products. Direct agencies to use their power as consumers to open new markets for green products, from paper and paperclips to trucks and tanks. With more than 500,000 buildings, 600,000 vehicles and \$18 billion in energy expenditures each year, the federal government can become a huge, sustained customer for green energy and products, spurring industries to invest in new plants and equipment. The government can require that its supply chains comply with standards to reduce their carbon footprints; it can require that state and local agencies do the same when they receive federal funding.
4. Call upon America's property/casualty and health insurers to adopt **innovative insurance instruments** and programs designed to reduce their customers' greenhouse gas emissions. Examples include rate incentives for buildings that reduce weather-related losses; education of customers on what they can do to reduce emissions; incentives for urban development practices

that reduce emissions and public-private partnerships to spread risk. As [Ceres](#) noted in 2006, “It is in the industry’s best interests to seize this moment to act on what is likely to become the greatest risk the industry has ever faced.”

5. Direct the Departments of Transportation and Energy to lead the development of federal guidelines for the improvement of America’s critical infrastructure, emphasizing resilience to the anticipated impacts of climate change and the use of low-carbon materials.
6. Request that the Securities and Exchange Commission (SEC) require publicly traded companies to disclose to their shareholders and prospective investors the risks associated with climate change, carbon pricing and energy price and supply volatility. The SEC now requires companies to disclose “financially material conditions” to shareholders in their annual reports. A [growing body of case law](#) suggests that potential environmental liabilities should be considered financially material conditions. Significant environmental and energy liabilities that are difficult to quantify can be disclosed in the “Management’s Discussion and Analysis of Financial Conditions,” a section of the companies’ annual reports.

LEGISLATIVE ACTIONS

7. Champion Congress’s overhaul of federal subsidies, including the elimination of perverse incentives that result in carbon emissions, and a fair and transparent system of carbon pricing. (See the Energy and Climate Chapters for details.)
8. To jump start economic recovery, urge Congress to support the proposal for an immediate [Green Economic Recovery Plan](#) that invests \$100 billion over two years to increase building efficiency, expand mass transit and rail, construct “smart” electric transmission systems and promote wind power, solar power and bio-fuels. The plan would allocate \$50 billion in tax credits to help finance building retrofits; \$46 billion in direct government spending on public buildings, mass transit and infrastructure; and \$4 billion in federal loan guarantees for building retrofits and investments in renewable energy.

As noted above, the Center for American Progress and the University of Massachusetts Political Economy Research Institute estimate that this package would create 2 million jobs nationwide and triple the number of new jobs paying \$16 an hour or more, compared to the same investment in the oil industry. In addition, the investment would reduce the jobless rate to 4.4 percent from 5.7 percent (in July 2008); bring back 800,000 lost construction jobs; reduce energy prices by moderating demand; and begin the transition to a low-carbon economy by starting to reconstruct communities and infrastructure.

9. To ensure America’s economic competitiveness and the health and safety of its citizenry, work with Congress to design a longer-term and more ambitious program to **modernize America’s critical infrastructure**. Trillions of dollars in public and private investment will be needed. Today, America is investing only 2.4 percent of its gross domestic product in infrastructure, half of Europe’s investment rate and only a third of China’s. The American Society of Civil Engineers has estimated that \$1.6 trillion is required nationwide for infrastructure repairs. A national commission estimates that the U.S. government should invest at least \$225 billion each year for the next 50 years to modernize our transportation systems. The U.S. Environmental Protection Agency estimates that the nation needs to spend \$11 billion more each year over the next 20 years to fix our water systems. The U.S. Department of Energy (DOE) figures it would cost at least \$43 billion to obtain 20 percent of the nation’s projected electric demand from [wind power](#) by

2030. Without these investments, however, the United States will be a first-world country with a third-world infrastructure, a situation which will stunt our economic growth. Today, flight delays cost at least \$15 billion each year; traffic congestion costs \$78 billion annually; inefficient buildings are causing an estimated \$58 billion annually in worker sick-time. A campaign to rebuild America's infrastructure would create [47,500 jobs for every \\$1 billion](#) invested. The best-available green building technologies could increase labor productivity by \$200 billion each year. Clean, domestic energy technologies will help prevent the transfer of \$10 trillion out of the U.S. economy over the next decade.

10. Create a U.S. **Innovation and Economic Development Administration** (IEDA) – an independent agency with Cabinet status – by merging the technology development and deployment programs of the DOE² with the U.S. Small Business Administration (SBA). (See sidebar for details.) Small businesses are the nation's principal source of new jobs and innovation. The new agency's mission will be to spur the creation of transformational low-carbon technologies, and transfer those technologies to the marketplace with the help of the small business sector.³

INNOVATION AND ECONOMIC DEVELOPMENT ADMINISTRATION

Budget and staff of the DOE's technology programs – the Offices of Fossil Energy, Nuclear Energy and Energy Efficiency and Renewable Energy – would be transferred to the new IEDA, joining the budget, staff and programs of the SBA. The new agency would consist of two divisions: Innovation and Economic Development.

Division of Innovation: This division would administer a) the Advanced Research Projects Agency–Energy (ARPA-E), the new energy research program authorized by Congress (see Action 13); b) the Small Business Innovation Research Act (Action 12); and c) the non-defense energy research programs of the nine national laboratories. It would chair a new interagency Energy Innovation Council⁴ responsible for developing a long-term national energy research and development strategy for the country.

Division of Economic Development: This division would continue the programs and functions of the SBA, including its loan guarantee program for small businesses, its international trade program and its business-development assistance to women, minorities and veterans. The division would take over the functions of the DOE's Office of Loan Guarantees. The division would give priority attention to small business development in communities adversely affected by climate change or climate policies and to women-, minority- and veteran-owned small businesses under its current programs for those groups.

The DOE's remaining programs would be reassigned to other agencies. The nonproliferation activities of the Office of Fossil Energy, and the functions of the Offices of Civilian Radioactive Waste Management, Environmental Management, Health, Safety and Security and Legacy Management could be consolidated into an independent National Nuclear Security Agency. The Energy Information Administration would be transferred to the U.S. Department of Commerce.

11. The 110th Congress [extended federal renewable energy tax credits](#) one year for wind energy projects and six years for solar and fuel cell projects. The President should urge Congress to extend the [wind energy credit](#) to 2016. Further, Congress should allow tribes to transfer their share of production tax credits to third parties with whom they partner for renewable energy development on tribal lands, as proposed in the 110th Congress in HR 1954.
12. Establish a **transferable research and development tax credit** that would allow a small business to partner with a larger firm with resources needed to commercialize a new technology and to assign the tax benefit to the partner firm.
13. Increase the **small business set-aside** in the Small Business Innovation Research Act to 5 percent, double its current level, with green technology designated as the program's highest priority. (Under the SBIR program, federal agencies that spend more than \$100 million on externally funded research and development must set aside 2.5 percent of those expenses in the next fiscal year to fund technology development by small companies. Funding now amounts to about \$2.5 billion annually.)
14. Appropriate full funding -- \$4.9 billion over five years -- to the Energy Transformation Acceleration Fund administered by the newly created [Advanced Research Projects Agency--Energy](#) (ARPA-E), now located at the DOE, and reassign the agency to IEDA. Add "reduce greenhouse gas emissions" to the ARPA-E mission statement, which establishes the goals of enhancing the nation's economic and energy security, reducing U.S. dependence on foreign energy sources, improving energy efficiency of the U.S. economy, reducing the impact of the energy sector on the environment and ensuring the United States leadership in developing energy technologies. Prohibit the expenditure of these funds on any emerging technology that the director of ARPA-E determines is likely to create net greenhouse gas emissions.
15. Spark and reward innovation. The President should propose that \$1 billion be allocated over five years to provide **platinum carrot awards** to the private sector to develop breakthrough technologies that substantially advance the nation's energy and climate security such as better batteries, plug-in hybrid vehicles and ethanol made from non-food crops. Technology categories should be established and nominated entries judged by teams from the DOE's national laboratories. The funds would be in addition to, rather than a replacement for, the \$1 billion over 10 years authorized in the Energy Independence and Security Act of 2007 for "H-Prize" (hydrogen-related) awards.
16. Dedicate all revenues from carbon pricing to support **America's transition to a post-carbon economy**. A cap-and-auction system is expected to produce \$50 billion to \$200 billion annually in new federal revenues, with revenues increasing as the carbon cap is reduced.⁵ By one estimate, revenues under the Lieberman-Warner bill, the proposal that advanced furthest in the 110th Congress, could amount to \$6.2 trillion in current dollars by 2050. Proposals for how best to use these funds range from a) returning 100 percent of auction revenues to each American in the form of regular [dividends](#) to reinforce the principle that everyone owns the atmosphere and should benefit from its protection to b) [dividing the revenues](#) among several priorities.

The Presidential Climate Action Project sees merit in all of these proposals, but supports the following initial distribution of revenues: one third returned annually to each American in the form of a dividend check or tax benefit; one third in programs that increase economy-wide energy efficiency and the use of renewable technologies to reduce the impact of higher fossil-fuel prices; and one-third dedicated to helping those least able to cope with the affects of climate change and policy. The Presidential Climate Action Project recommends that the goal be to return 100 percent of revenues from emission allowance auctions to the American people, with

the amount increasing as federal subsidies for fossil energy are redirected to energy efficiency and renewable energy development and commercialization, as market forces result in high levels of energy efficiency, and as equity issues are adequately addressed.

17. Create and fund the “[Green New Deal](#),” a program that trains workers at all professional levels in the skills required for the new green economy, provides entry to green career ladders for young Americans and offers opportunities and incentives for community service. Examples include:
 - a) a Clean Energy Corps as part of AmeriCorps to train workers for weatherization, energy conservation projects, environmental restoration and infrastructure improvement;
 - b) an American Conservation Corps, administered by the Corporation for National and Community Service, to help improve America’s critical infrastructure and to assist with urban and rural development projects that result in reductions in greenhouse gas emissions and climate adaptation;
 - c) full funding of the Green Jobs Act contained in the Energy Independence and Security Act of 2007 to train low-income and working class Americans in green career paths; and
 - d) a substantial federal revolving loan fund to capitalize Green New Deal projects and to leverage additional state, local and private funds.

¹ For a more comprehensive discussion of the economic opportunities inherent in climate action, see the [white paper](#) commissioned by the Presidential Climate Action Project from Hunter Lovins, president of Natural Capitalism Solutions Inc.

² These would include the Offices of Energy Efficiency and Renewable Energy, Fossil Energy, Electricity Delivery, Energy Reliability and Science and the non-weapons functions of the Office of Nuclear Energy.

³ Small businesses are defined by the SBA as companies with fewer than 500 employees.

⁴ See “[A New Strategy to Spur Energy Innovation](#),” 10.

⁵ If the Congressional Budget Office considers carbon pricing to be an “indirect business charge” that is likely to reduce federal income and payroll tax revenues, and if the proceeds from the auction of emission allowances are less than the anticipated reduction in tax revenues, Congress may be required to send a portion of auction revenues to the Treasury. By one estimate, that requirement could involve as much as 25 percent of auction revenues.