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Environmental Investing Policy: The Fulcrum

Angelo A. Calvello, PhD

Editor in Chief

Four factors drive environmental investing: science, economics, policy, and technology. Policy is, unquestionably, the fulcrum of this relationship. Without policies that are "loud, long, and legal," innovators and investors are duly cautious about committing their intellectual and financial capital to develop, fund, and deploy technologies that tackle our most pressing environmental challenges.

In this issue, we have attempted to identify those individuals who are working to form and implement key policies that provide the necessary conditions for environmental investing. In addition to providing a brief summary of each person's contributions, we present a *Focus on . . .* article that highlights eight of these individuals who provided us with an in-depth look at their unique perspectives and innovative ideas.

We thank our readers, the community at large, and our editorial and advisory boards for their nominations, which our editorial team vetted. The final decision to include a person rested solely with me. The global and interdisciplinary context of environmental policy means that we have almost certainly overlooked deserving individuals. Fortunately, our electronic format allows us to remedy this error of omission, so we invite you to submit the names and appropriate qualifications of other policymakers. We also invite those individuals featured in this issue to provide additional information to be included in a *Focus on . . .* article.

And not to be overlooked, this issue also includes three rigorous reviews of books that certainly deserve our attention and a thoughtful manuscript by Raghu Bir Bista, "Environmental Investment in Community Forest Management (CFM): A Case Study of Mid-Hill Nepal," which examines the efficacy and impact of local community investment in forest management in Nepal.

In our next issue, we will be highlighting the most influential academics in environmental investing. We are now accepting nominations, so please send us your thoughts and suggestions.

Best wishes,

Dr. Angelo Calvello

Environmental Investing: The Most Influential Policy Makers

Leyla Acaroglu, Director of Eco Innovators, Filmmaker, Australia

Leyla Acaroglu founded the environmental consultancy and creative social innovation agency, Eco Innovators. Acaroglu's award-winning series of short animated videos, "The Secret Life of Things," explore hidden environmental impacts of everyday things. She is an advocate for strategic sustainability decision making.

Luis Roberto Acosta, Director of Latin American Regional Activities at the Climate Institute, Mexico

Luis Roberto Acosta is the moving force behind the world's highest Global Climate Observation Center. He is working to fill a crucial gap in the Global Atmospheric Watch Network coordinated by the World Meteorological Organization (WMO), in the highest mountains that surround the Gulf of Mexico. Acosta's research addressed the interaction between tropospheric and stratospheric ozone and UV radiation in Mexico City's environment. He developed strategic collaborative efforts between science, society, and governments to face environmental challenges.

Dr. Frank Ackerman, Senior Economist at Synapse Energy Economics and a Senior Research Fellow at the Global Development and Environment Institute at Tufts University, USA

As an economist who specializes in climate change, Dr. Ackerman is also a prominent critic of conventional economic approaches to climate policy and the abuses of cost-benefit analysis. He has directed studies for clients that include Greenpeace, the European Parliament, and U.S. federal and state agencies. He is the author of: *Can We Afford the Future? Economics for a Warming World* (Zed Books, 2009)

Peter Bach, Chief Adviser at the Danish Energy Agency, and President of The European Council for an Energy Efficient Economy, Denmark

Peter Bach has been strongly involved in international energy efficiency activities, and a representative for the Danish government in negotiations of new directives in the EU. He is strongly involved in the formulation, implementation, and evaluation of Danish energy efficiency policies and measures. He has been especially involved in the development of the new Danish Energy Strategy 2050, which shows how Denmark can become independent of fossil fuels.

Saima Baig, Coordinator of Environmental Economics Programme at the International Union for the Conservation of Nature; Head of Environmental Research at Better Brains, UK and Pakistan

Baig's research work on mangrove ecosystems in Pakistan, valuing biodiversity in the Maldives, sustainable financing strategies for coastal areas in Thailand and protected areas in Lao PDR, and forest governance has received international acclaim.

Per Bertilsson, Deputy Executive Director of the Stockholm International Water Institute, Sweden

He is responsible for the overall project management and strategic direction of the Stockholm International Water Institute (SIWI), a Stockholm-based policy institute that generates knowledge and informs decision-making towards water wise policy. This includes performing research, building institutional capacity, and providing advisory services in five thematic areas: water governance, trans-boundary water management, climate change and water, the water-energy-food nexus, and water economics. Mr. Bertilsson coordinates knowledge services activities, which include applied research, advisory services, and capacity building. He also provides support for the UNDP Water Governance Facility as a policy adviser to governments and stakeholders on water governance matters.

Dr. Fatih Birol, Chief Economist and Director of Global Energy Economics at the International Energy Agency, France

Dr. Birol oversees the IEA's World Energy Outlook publication on global energy markets and is the founder of the IEA Energy Business Council, a forum which facilitates the cooperation between the energy industry and energy policymakers. He undertakes additional responsibilities at the IEA, an autonomous organization that works with countries to stimulate economic growth through the promotion of clean energy, and has also worked for the UN on sustainable energy matters, and is the chairman of the World Economic Forum's Energy Advisory Board.

Michael Block, Co-founder of Sustainability Practice Network, and Chief Executive and Principal of Kinetix [business ecology] USA

In order to further a productive community approach to sustainability issues, Mr. Block co-founded the Sustainability Practice Network, an interdisciplinary forum that attempts to raise awareness and deal with issues of corporate sustainability and sustainable development. Block is also the chief executive of Kinetix, a company that consults with clients on how to optimize corporate sustainability and sustainable real estate business models within their own corporations.

Lester Brown, Founder of the Earth Policy Institute and Worldwatch, USA; Reah Janise Kauffman, Co-founder and Vice President, of the Earth Policy Institute, USA

Mr. Brown, the author of numerous books, including *World on the Edge: How to Prevent Environmental and Economic Collapse,* helped to pioneer the concept of environmentally sustainable development. His principal research areas include food, population, water, climate change, and renewable energy.

Ms. Kauffman oversees the administrative aspects of Earth Policy Institute, including managing its worldwide publishing network, outreach program, website, marketing, fundraising, and personnel.

Dr. Gro Harlem Brundtland, Former Prime Minister of Norway; Former Director General of the World Health Organization; Special Envoy for Climate Change for the UN, Norway

Dr. Brundtland, a medical doctor, is the former Prime Minister of Norway and former Director General of WHO. She helped develop the concept of sustainable development as the chair of the World Commission of Environment and Development (the Brundtland Commission). Recently, she headlined the 2012 Africa CEO Round-table & Conference on Corporate Sustainability & Responsibility.

Brian Castelli, Alliance to Save Energy Senior Fellow, USA

Mr. Castelli has worked in the energy field for thirty years, and has a strong background in energy research, policy, and development. He has previously held positions in the Pennsylvania Energy Office (where he developed an alternative fuel plan and a loan fund for energy-saving measures) and in the U.S. Department of Energy, and has run his own energy consulting firm. He now works for ASE, a non-profit organization that seeks to illuminate the environmental and financial benefits of energy efficiency through research and political influence.

***Eileen Claussen, President of Center for Climate and Energy Solutions (C2SE); President of Strategies for the Global Environment, USA**

Ms. Claussen is the former assistant secretary of state for oceans and international environmental and scientific affairs and served as a special assistant to the president and senior director for global environmental affairs at the National Security Council. She was director of atmospheric programs at the U.S. Environmental Protection Agency, where she was responsible for activities related to the depletion of the ozone layer; Title IV of the Clean Air Act; and the EPA's energy efficiency programs, including the Green Lights program and the Energy Star program. ***Learn more about Ms. Claussen's work on page 27 and watch her video interview, which is available from the link on the JEI home page.***

Polly Courtice, Director, University of Cambridge Programme for Sustainability Leadership, Cambridge, UK

Ms Courtice is a member of the University's Board of Executive and Professional Development and academic director of CPSL's Masters in Sustainability Leadership. She is a director of Jupiter Green Investment Trust and chairs Anglian Water's advisory group on Climate Change and Economic Growth. In 2007, she was appointed by Al Gore to run his Climate Project in the UK, helping leaders deepen their understanding of climate change and explore appropriate action. In 2008, she was made a Lieutenant of the Victorian Order (LVO) announced in the Queen's Birthday Honours list.

Philippe Cousteau, Co-founder and President of Earth Echo International; Co-founder and Chairman of Global Echo Foundation; partnered with AdvisorShares to launch Global Echo ETF, USA

Mr. Cousteau launched the Global Echo Exchange Traded Fund along with AdvisorShares in order to provide funding solutions to social and environmental challenges through the Global Echo Foundation and to support sustainable investing.

Gary Dunning, Executive Director of The Forests Dialogue (TFD) at Yale University, USA

Mr. Dunning has been working on forest related issues for over 25 years. He is the founding Executive Director of the Yale University's Global Institute of Sustainable Forestry and helped to create and lead the Yale Forest Forum. The Forest Dialogue comprises a group of individuals from diverse interests committed to conservation and sustainable uses of the earth's forests.

Andreas Enge, Head of the Strategy and Analysis Unit at Enova; Vice President at The European Council for an Energy Efficient Economy, Norway

Enova SF is a Norwegian organization that was "established in order to drive forward the changeover to more environmentally friendly consumption and generation of energy" by promoting more efficient energy consumption and the production of renewable energy. The main focus of Andreas Enge's work at Enova is policy analyses and strategies in line with those two goals. He works on program design and evaluation and is also involved in the development of national and

international energy-related standards. Mr. Enge is on the International Energy Agency working party for energy efficiency and represents Enova on the European Council for an Energy Efficient Economy.

Aniol Esteban, Head of Environmental Economics at the New Economics Foundation (NEF), UK

Mr. Esteban oversees economics research and works with his team to advance their goals through policy, education, and campaigning work. He is a former economist at the Royal Society for the Protection of Birds and has been involved with various EU research projects on water, marine, and nature conservation policies. He currently works on a wide range of topics, including fisheries, climate change, energy, ownership of natural resources, ecological limits, and the links between the natural environment and well-being.

Christiana Figueres, Executive Secretary of the UN Framework Convention on Climate Change; former Senior Advisor to C-Quest Capital, USA and Costa Rica

Ms. Figueres has written extensively on the design of climate solutions and has frequently advised the private sector on how to play a leadership role in climate mitigation. She has been involved in climate change negotiations since 1995, and was a member of the Costa Rican negotiating team and representative of Latin America and the Caribbean on the executive board of the Clean Development Mechanism, and the vice president of the Bureau, UN Framework Convention on Climate Change (UNFCCC). Ms. Figueres has served on several boards of non-governmental organizations involved in climate change issues, including the Voluntary Carbon Standard.

John Firth, CEO and Co-Founder of Acclimatise, UK

For over 20 years, Mr. Firth has worked on the impacts of climate change on business planning and risk management, particularly concerning large fixed-asset companies and the financial services sector. He co-founded Acclimatise, an advisory firm that utilizes science and technology to assist clients in risk management and financial adaptation in the face of climate change. He has also published numerous papers, is a frequent speaker on climate issues, and is interested in the promotion of climate finance in developing countries.

Dr. Dörte Fouquet, Director at the European Renewable Energy Federation, Belgium and Germany

Dr. Fouquet's emphasis in her professional career has been on various legal aspects of energy, the environment, and competition, as well as on administrative law. Her major focus in counseling is on issues in the field of energy law, especially in relation to renewable energies, energy efficiency, grid regulations, and competition law. She also works in the area of industrial environmental legislation and has extensive experience working with national, international and, in particular, European institutions and NGOs.

***Peter Fusaro, Founder of Global Change Associates, USA**

Mr. Fusaro has worked for over thirty years in the international energy sphere in numerous positions. He is an advisor or board member for multiple cleantech startup companies, teaches a course on renewable energy at Columbia University, and is a member of the Board of Trustees of the New York Institute of Energy and Water. He has authored sixteen books on renewable energy and finance, and is the founder of Global Change Associates, a firm that offers advice and consultation to corporate clients on issues concerning renewable energy and the impact of climate change on financial markets. ***Learn more about Mr. Fusaro's work on page 31.***

Bill Ginn, Chief Conservation Officer for The Nature Conservancy; Director of the Global Forest Partnership, USA

In his role as director of the Global Forest Partnership, Bill Ginn has displayed foresight and innovation in helping the Nature Conservancy protect over 3 million acres of forestland. He also has served as director of the Forest Conservation Strategies Program, deputy director of the Eastern U.S./Caribbean Region, and deputy director of the Asia-Pacific Region. Recognized throughout the larger conservation community as a thought-leader, Ginn is also the author of *Investing in Nature,* a book about engaging the private sector in conservation.

***Kirsty Hamilton, Associate Fellow, Chatham House; Policy Head and member of the Steering Committee of the Low Carbon Finance Group, UK**

Ms. Hamilton has 23 years' experience in international climate and energy policy, including in positions as an associate fellow at the Energy, Environment and Development Programme at Chatham House, with the World Economic Forum's Global Council on Sustainable Energy, the World Economic Forum Green Investing Committee, as an advisor to the UNEP Finance Initiative, as well as with other organizations. She currently works with the Low Carbon Finance Group to bring together senior energy finance practitioners from across the finance spectrum to engage with lead policy counterparts. ***Learn more about Ms. Hamilton's work on page 33.***

Dr. James Hansen, Director, Program on Climate Science, Awareness and Solutions, USA

Dr. Hansen is director of the new Program on Climate Science, Awareness, and Solutions, which will engage in climate research and policy communication and outreach to civic leaders and the media. The former director of the NASA Goddard Institute for Space Studies, Dr. Hansen is well-known for his research in radiative transfer in planetary atmospheres, which may help scientists to monitor and study changes to the earth. He is an accomplished researcher who is recognized for his activist role in climate science for the purpose of understanding current climate trends and the means of mitigating climate change.

Connie Hedegaard, EU Commissioner for Climate Action, Denmark

Ms. Hedegaard helped set up Denmark's Ministry of Climate and Energy and, on behalf of Denmark, hosted the UN Climate Change Conference in 2009. Her priorities include implementing the European Climate and Energy package and helping to lead Europe toward a competitive low-carbon economy.

Martin Hiller, Director General of the Renewable Energy & Energy Efficiency Partnership (REEEP), Austria

Mr. Hiller's in-depth knowledge of climate change and energy issues comes from his more than 20 years of experience in specialized policy communications and clean energy campaigns. Under his leadership, REEEP has sharpened its focus as a catalyst for up-scaling clean energy business models. Recently Martin finished a long career at the environmental NGO WWF where he had led campaigns and communications in the global climate and energy program.

***Rainer Hinrichs-Rahlwes, President of the European Renewable Energy Council and the European Renewable Energy Federation, Belgium**

Mr. Hinrichs-Rahlwes is an advocate for renewable energy and effective support systems. He promotes system transformation towards an integrated energy framework that will result in a fully renewables-based energy supply. ***Learn more about Mr. Hinrichs-Rahlwes's work on page 36.***

Wael Hmaidan, Director of the Climate Action Network (CAN), Lebanon

Mr. Hmaidan is the director of CAN-International, a confederation of over 850 independent NGO's from over 100 countries. CAN's vision is to protect the atmosphere while allowing for sustainable and equitable development worldwide. Wael has over 16 years of experience working in NGO management and green campaigning, during which he has focused primarily on climate change. He helped raise awareness of climate issues in the Arab world through the campaign he instituted with his own organization, IndyACT. He also served as one of the lead negotiators for the Lebanese government in the UNFCCC.

Trevor Houser, Visiting Fellow at the Peterson Institute for International Economics; Partner at Rhodium Group, USA

At the Rhodium Group, Mr. Houser leads the energy and natural resources work. His areas of research include energy and environmental policy and markets and energy-related international trade and investment issues. As a visiting fellow at the Peterson Institute, he writes on energy, commodity, and environmental market and policy issues. While in government, Trevor negotiated seven bilateral U.S.–China energy agreements, including the U.S.–China Shale Gas Initiative and the establishment of the U.S.–China Clean Energy Research Center.

Dr. Naoko Ishii, CEO and Chairperson of the Global Environment Facility (GEF), Japan

Before becoming the fourth CEO and Chairperson of the GEF, Dr. Ishii, as Deputy Vice Minister of Finance, was responsible for Japan's international financial and development policies, and for its global policies on environmental issues such as climate change and biodiversity. She led the Japanese delegation at the Transition Committee for designing the Green Climate Fund. Dr. Ishii's career at the Ministry of Finance began in 1981 with a focus on the international sphere, particularly development issues. Later in her career, she was Japan's Director for Bilateral Development Finance (2004–2006) and for coordination with Multilateral Development Banks (2002–04).

Bruce Katz, Vice President and Director of the Metropolitan Policy Program at the Brookings Institute, USA

Mr. Katz is the founding director of the Brookings Metropolitan Policy Program, which aims to provide decision makers in the public, corporate, and civic sectors with policy ideas for improving the health and prosperity of cities and metropolitans areas. His advocacy for reforms that will help metropolitan areas grow embraces competitive and sustainable ways to improve the lives of all citizens and to extend that concern to the life of the planet.

Edward Kearns, Acting Chief of the Remote Sensing and Applications Division, National Climatic Data Center at the National Oceanic and Atmospheric Administration, USA

Dr. Kearns works on the creation of climate data records from satellite observations; geophysical data management and stewardship; data systems that support the transmission, archive, and distribution of observed and modeled data; high performance computing; coastal ecosystem restoration and project management; ocean dynamics, observing systems, and near-shore processes; and instrumentation.

Alexandre Kossoy, Senior Financial Specialist in the Carbon Finance Unit at the World Bank, USA

Alexandre Kossoy has over 20 years of professional experience in carbon finance. He is the team leader and co-author of the World Bank reports, *State and Trends of the Carbon Market,* for 2010, 2011, and 2012. He oversees many financial activities within the Unit, which include the definition of the carbon prices and

other commercial conditions of the World Bank's carbon funds and facilities. Mr. Kossoy has been actively involved in most World Bank financial instruments related to carbon finance, including: the Strategic Framework on Climate Change and Development for the World Bank Group (co-chair of the finance working group), the World Bank carbon neutral program, and the carbon-linked bonds.

***Cary Krosinsky, Principal at S3; Columbia University; Executive Director of the Network for Sustainable Financial Markets (NSFM)**

Mr. Krosinsky teaches sustainability and investing at Columbia University's Earth Institute and writes about climate change issues. As the NSFM executive director, Cary helps the group focus its research and debate on the underlying causes of financial market instability and on the development of fundamental reforms. Previously, he helped oversee and create the Principles for Responsible Investment. He is also a founder and former director of the Carbon Tracker Initiative. ***Learn more about Mr. Krosinsky's work on page 38.***

Dr. Alan Krupnick, Director of the Center for Energy Economics and Policy at Resources for the Future; Director of Research and a Senior Fellow at RFF, USA

Dr. Krupnick is the lead author of the study result, *Toward a New National Energy Policy: Assessing the Options*; a consultant to state governments, federal agencies, and private corporations, including the Canadian government, the European Union, the WHO, and the World Bank. He is also a former senior economist on the President's Council of Economic Advisors, where his role was to advise the Clinton administration on environmental and natural resource policy issues.

Fred Krupp, President of Environmental Defense Fund, USA

As the president of Environmental Defense Fund, Fred Krupp has been influential in the development of innovative market-based solutions to environmental problems, such as the market-based acid rain reduction plan in the 1990 Clean Air Act, and for engaging large corporations in strategic partnerships to improve energy efficiency across the global supply chain. In 2011, he was appointed to a U.S. energy panel convened to recommend measures to reduce the environmental impact and improve the safety of shale gas production. In this role, he advocated for greater oversight and enforcement, strong regulation of air and water pollution, public disclosure of chemicals in fracking fluids and wastewater, minimization of land use impacts, and the reduction of methane leakage.

Rachel Kyte, Vice President of Sustainable Development at the World Bank, USA and UK

Ms. Kyte's overall responsibilities at the World Bank are for the organization's global work in agriculture, the environment, infrastructure, urban development, and social development. Previously, she was the vice president for Business Advisory Services at the International Finance Corporation (IFC). Ms. Kyte served as IFC's Director for Environmental and Social Development, where she led efforts to develop new sustainability performance standards.

***Julia Langer, Chief Executive Officer, Toronto Atmospheric Fund (TAF), Canada**

Ms. Langer works on advancing low-carbon solutions for cities. She has worked with the Canadian government and with NGOs, where she led campaigns to address climate change, protect marine turtles, and ban toxic chemicals. ***Learn more about Ms. Langer's work on page 41.***

Dr. Jeremy Leggett, Founder and non-Executive Chairman of SolarCentury; Founder and Chairman of SolarAid, UK

The author of *The Energy of Nations*; *The Carbon War;* and *Half Gone,* Dr. Leggett founded renewable energy company Solarcentury in 1998 with the goal of making solar energy accessible. He is also the founder and Chairman of SolarAid, an African solar lighting charity set up with Solarcentury profits. He is an activist for employing renewables and redeploying energy funding as solutions to systemic environmental, financial, and social global risks.

***Li Junfeng, President of Chinese Renewable Energy Industries Association (CREIA); Director General of National Center for Climate Change Strategy and International Cooperation (NCSC), China**

Mr. Li is an expert in climate change and technology transfer issues. Recognized as one of China's preeminent advocates of renewable energy, he has helped to make possible the implementation of a national technology program for wind and solar PV. He has also worked on renewable energy project development for GEF, the World Bank, and the UNDP. ***Learn more about Mr. Li's work on page 43.***

Li Yong, Director General of the United Nations Industrial Development Organization, China

Mr. Li was elected the Director General of UNIDO in 2013. Before his work with UNIDO, Mr. Li served for over a decade as China's Vice Finance Minister and Assistant Finance Minister. Mr. Li has placed particular emphasis on the alleviation of poverty and promotion of agricultural development, establishing the China Agricultural Development Fund to provide agricultural businesses with access to public and private financial resources.

Ernst Ligteringen, Chief Executive of Global Reporting Initiative (GRI), The Netherlands

Mr. Ligteringen is in charge of the organizational and program management of the GRI, a non-profit organization that works towards a more transparent and sustainable global economy by supplying companies and other organizations with environmental reporting standards in the hopes that responsible reporting will one day become standard practice.

Mindy Lubber, President of Ceres, Inc.; Founder of Green Century Capital Management; Director of the Investor Network on Climate Risk, USA

In 1991, Ms. Lubber launched Green Century Capital Management, the first U.S. mutual fund company to be wholly owned by nonprofit public interest groups. She is a founding board member of Ceres, which advocates for sustainability leadership through a network of investors, companies, and public interest groups. She also directs the Investor Network on Climate Risk (INCR), a group of more than 100 institutional investors managing $10 trillion in assets focused on the business risks and opportunities of climate change.

Nick Mabey, Founding Director and Chief Executive of Third Generation Environmentalism (E3G), UK

E3G is a non-profit international organization dedicated to accelerating the transition to sustainable development. Nick Mabey manages the organization and leads E3G's work on European climate change policy, climate diplomacy, and foreign policy, as well as the security implications of climate change. His previous work in green energy and environmental investing issues included a position as a senior advisor in the UK Prime Minister's Strategy Unit. In that role, he led work on energy, climate change, countries at risk of instability, organized crime and fisheries, and other national and international policy issues.

Bill McKibben, Author, *The End of Nature*, Guggenheim Fellow, Founder of 350.org, USA

Bill McKibben is a well-known environmental author and activist and the founder of 350.org, an international climate change campaign. His 1989 book *The End of Nature* was the first book to warn the general public about the threat of global warming. He has been awarded Guggenheim and Lyndhurst Fellowships, and won the Lannan Prize for nonfiction writing in 2000. His latest book is *Oil and Honey: The Education of an Unlikely Activist.*

Jennifer Morgan, Director of Climate and Energy Program at the World Resources Institute (WRI), USA

At the WRI, Ms. Morgan oversees work on climate change issues and guides its strategy in helping countries and individuals act to ensure a zero-carbon future. Under her leadership, the program is in the process of deepening its engagement in China, India, and Brazil. She has been recognized for her long-term commitment to international climate issues and the empowerment of civil society.

Nils Kristian Nakstad, CEO of Enova, Norway

Mr. Nakstad oversees Enova SF, a public enterprise owned by the Royal Norwegian Ministry of Petroleum and Energy. Enova`s main objective is to promote environmentally friendly restructuring of energy end-use and energy production. This energy restructuring is a long-term initiative to develop the market for efficient and environmentally friendly energy solutions that contribute to strengthening the security of supply for energy and reduce the emissions of greenhouse gases. Mr. Nakstad works with companies to implement innovative solutions on a large scale and to use technology development in the face of climate and energy challenges.

Uzoamaka Nwamarah, Senior Climate Change Specialist at the African Development Bank (ADB), Tunisia

The climate change specialist Uzoamaka Nwamarah has helped coordinate the African Development Bank's efforts towards establishing the Africa Carbon Facility. She has worked on the proposal for the creation of such a facility that will serve as an instrument to significantly increase Africa's share in this market. Ms. Nwamarah has worked with the ADB to increase its activity on climate change related projects, which the bank sees as central to its core business and an issue that requires urgent action.

Simon O'Connor, CEO of Responsible Investment Association Australasia, Australia

Mr. O'Connor has worked in the financial services and economics spheres where they converge with sustainability and environmental issues in the UK and Australia. For over five years, he worked with an environmental NGO, advocating for a smarter economy that is cleaner, more productive, and sustainable. While working at the Australian Conservation Foundation (ACF), he led the debate on issues important to the development of sustainable financial markets. These issues included extensive work advocating for a carbon price and the financing of Australia's low carbon economy. His specialties include analysis and advocacy on renewable energy financing, carbon pricing, infrastructure, green economy, and environmental taxation, as well as river, marine, and forest issues.

Saskia Ozinga, Co-Founder, Campaign Coordinator, and member of FERN; Facilitator of the Forest Movement Europe, UK and Belgium

With an expertise in climate change, export credit agencies, and forest peoples, Ms. Ozinga has worked on FERN's five campaign areas: climate change, development aid, forest peoples' rights, forests and biodiversity, and trade and investment. FERN is a collaborative NGO with a mission to achieve greater environmental and social justice, focusing on forests and forest peoples' rights in the policies and practices of the European Union.

***Shilpa Patel, Principal Advisor at the World Resources Institute in the Climate Finance and the Private Sector Initiative; Senior Advisor to the Climate Business Department at the International Finance Corporation (IFC), USA**

Shilpa Patel is a climate finance expert whose work focuses on understanding how best to mobilize private capital for climate-related investments, thus helping countries move to lower-carbon growth trajectories. She has also worked as a consultant on climate finance for financial institutions and banking sector clients. Previously, she headed the IFC's work on climate change strategy and metrics, supporting the corporation's climate change agenda and commitment to increase its climate-friendly lending. ***Learn more about Ms. Patel's work on page 44.***

Carl Pope, Emeritus Director of the Sierra Club, USA

Carl Pope is the former Executive Director of the Sierra Club. He is also an environmental political activist and an advocate for renewable energy investments.

Andrew Raingold, Executive Director of Aldersgate Group, UK

Andrew Raingold is the lead author of Aldersgate Group reports and a regular commentator on sustainability issues. He has also served on a succession of government advisory groups, including those relating to a green economy and sustainable production and consumption.

Kenty Richardson, Director for International Relations & Strategic Development at the Regional Environmental Center for Central and Eastern Europe, Spain

Kenty Richardson serves as a director for the Regional Environmental Center for Central and Eastern Europe (REC), an international organization whose mission is to address environmental issues. His work includes helping to promote the integration of biodiversity and sustainable use concerns in education and rural development at both national and international levels.

Mary Robinson, Chair of the Mary Robinson Foundation—Climate Justice, Ireland

Mary Robinson established the Mary Robinson Foundation—Climate Justice (MRFCJ) as a center for thought leadership, education, and advocacy on the struggle to secure global justice for those typically forgotten people vulnerable to the impact of climate change: the poor, disempowered, and marginalized across the world.

Dr. Joseph Romm, Author, Senior Fellow at the Center for American Progress, USA

Dr. Romm is an author, a blogger, a physicist, and a climate expert who concentrates on methods for reducing greenhouse gas emissions and global warming and increasing energy security through energy efficiency, green energy technologies, and green transportation technologies. He writes and maintains the climate blog "Climate Progress" through the Center for American Progress.

Scott Settelmyer, Managing Director and Co-Founder of TerraCarbon, USA

Scott Settelmyer's company TerraCarbon LLC is an advisory firm supporting the development of forest- and land-based projects and programs that reduce greenhouse gases. TerraCarbon LLC provides a range of advisory services to the world's leading conservation organizations, environmentally and socially responsible corporations, and forward-thinking investors.

Achim Steiner, Executive Director of the UN Environment Programme; Under-Secretary-General of the UN, USA and Germany

An expert in environmental politics, Achim Steiner speaks and writes on climate change and a green economy. He also chairs the United Nations Environment Management Group (EMG). Before joining the UN Environment Programme, Mr. Steiner served as Director General of the International Union for Conservation of Nature (IUCN) from 2001 to 2006 and, prior to that, as secretary general of the World Commission on Dams. His professional career has included assignments with governmental, non-governmental, and international organizations in different parts of the world, including India, Pakistan, Germany, Zimbabwe, the United States, Vietnam, South Africa, Switzerland, and Kenya. Mr. Steiner has worked both at the grassroots level and the highest level of international policymaking to address the interface between environmental sustainability, social equity, and economic development.

Lord Nicholas Stern, Chair of the Grantham Research Institute on Climate Change and the Environment; Chair of the Centre for Climate Change and Economics; Head of the Stern Review on the Economics of Climate Change (2006), UK

As head of the Government Economic Service, Lord Stern led the Stern Review on the Economics of Climate Change, published in October 2006. Lord Stern currently serves as the chair of the Grantham Research Institute on Climate Change and the Environment, which brings together international expertise on economics, policy, finance, geography, international development, and political economy. He is also a professor at the London School of Economics.

Pavan Sukhdev, Founder and CEO of Green Indian States Trust (GIST); Yale University Visiting Fellow, USA and India

Pavan Sukhdev is the founder and CEO of GIST Advisory, a specialist consulting firm that helps governments and corporations discover, measure, value, and manage their impacts on natural and human capital. For the United Nations Environment Programme (UNEP), Mr. Sukhdev's report "Towards a Green Economy" synthesized years of research to show, with real numbers, that environmentally sound development is not a bar to growth but rather a new engine for growing wealth and creating employment in the face of persistent poverty. He was also the lead on the groundbreaking "The Economics of Ecosystems and Biodiversity" (TEEB) report that emphasizes the value of accounting for the global economic benefits of biodiversity.

Terry Tamminen, Founder of Seventh Generation Advisors; Former Secretary of the California Environmental Protection Agency, USA

Terry Tamminen established the non-profit organization Seventh Generation Advisors to guide climate-change policy initiatives for state and world governments. As the former Secretary of the California Environmental Protection Agency, Mr. Tamminen played a crucial role in establishing California's groundbreaking environmental policies.

Tessa Tennant, President of the Ice Organisation Ltd.; Trustee of the Carbon Disclosure Project (CDP), UK

Having worked in the environmental business and investment sphere for over 20 years, Ms. Tennant has been instrumental in many related initiatives. She was the co-founder and first chair of CDP, a non-governmental organization that works with policymakers, investors, and businesses using market strategies to try to encourage responsible environmental practices. She now serves as a trustee there. She also co-founded the UK's first equity investment fund for sustainable development as well as the Association for Sustainable and Responsible Investment in Asia and the UK Social Investment Forum. Ms. Tennant has served on a number of UK and UN governmental environmental advisory panels and has been the recipient of multiple personal honors for environmental leadership. She has also worked with the UK Green Investment Bank. Ms. Tennant is currently the president of the Ice Organisation, which helps empower consumers to affect corporate environmental responsibility by offering rewards for buying products from environmentally friendly businesses.

William Andrews Tipper, Head of Sustainable Business at Green Alliance, UK

William Andrews Tipper is the head of sustainable business at Green Alliance, an environmental think tank that develops policies relating to the environment and climate change. At Green Alliance, Mr. Tipper works with the private sector to share ideas and discuss policy issues relating to the environment. Before holding this position, Mr. Tipper advised companies on issues relating to EU policy and legislation for FTI Consulting.

Craig Urch, Senior Product Manager, IHS Emerging Energy Research, USA

Mr. Urch is in charge of strategic management and planning at IHS Emerging Energy Research, a consulting and research firm that works with investment, manufacturing, technology, power, and other companies on renewable-power

services. He works closely with both the research and account-management teams. In his two decades of experience, Mr. Urch has worked for both corporate and non-profit organizations and has spent the last ten years working in the research and consulting sectors for numerous clients, including Boston Wind Works.

Jim Walker, Board Member of The Climate Group, China and UK

Jim Walker has worked for six years as a consultant on public and private sector responses to environmental and social challenges. With Steve Howard, he has advised WWF International on the development of the Clean Development Mechanism Gold Standard and produced the business plan for The Climate Group on behalf of the Rockefeller Brothers Fund. Jim was lead author of the Mining, Minerals and Sustainable Development report "Finding the Way Forward" on industry voluntary initiatives and was a contributor to the WWF–UK report "To Whose Profit?" on the business case for sustainability. He has produced stakeholder-engagement reports for BP Scotland and Nirex and has developed approaches for assessing corporate exposure to climate change-related risk.

Paul Watchman, Visiting Senior Fellow and Co-Head of the Sustainable Finance Project at the London School of Economics, UK

Along with Hank Paulson, the former chairman and CEO of Goldman Sachs and U.S. Treasury Secretary, Paul Watchman was named one of the five most influential world figures in the development of sustainable banking in 2006. He has lectured and published widely and is the author or co-author of many legal textbooks. His latest is *Climate Change: A Guide to Carbon Law and Practice*.

Dr. Jurgen Weiss, Head of the Brattle Group's Climate/Carbon Practice, USA

Dr. Weiss is an energy economist who heads the Brattle Group's climate change practice. He specializes in areas such as renewable energy, energy efficiency, energy storage, and carbon pricing. He has served as a consultant for carbon pricing and the demand side of electricity markets.

Michael Woods, Principal Advisor at Irbaris, UK

Michael Woods is an expert on environmental and sustainability issues who focuses, in particular, on various aspects of climate change, renewable energy, biodiversity protection, and sustainable forestry. He serves as legal counsel to the

Iwokrama International Centre, which is responsible for managing the Iwokrama forest reserve in Guyana, South America. Mr. Woods seeks out innovative and sustainable market-based investment approaches to reduced deforestation, climate change regulation, biodiversity protection, and water resources management.

Baroness Bryony Worthington, Shadow Spokesperson for Energy and Climate Change in the House of Lords, environmental campaigner at Sandbag, UK

Baroness Worthington is an experienced climate campaigner who has worked for both the government and the private sector. She established a successful campaign for the environmental group Friends of the Earth and developed the concept of "carbon budgeting" while working for the group. The baroness was also a key member of the team that drafted the UK's Climate Change Bill. In 2008, she established Sandbag, a non-profit organization devoted to raising awareness about emissions trading.

Kandeh Yumkella, Special Representative and CEO for the United Nation's Sustainable Energy for All Initiative, Sierra Leone

Mr. Yumkella served two terms as the Director General of UNIDO and is currently acting as the Special Representative and CEO for the UN's Sustainable Energy for All Initiative. Mr. Yumkella has made access to clean and efficient energy an international priority and has stressed the importance of ending "energy poverty."

***Dimitri Zenghelis, Principal Research Fellow at the Grantham Research Institute at the London School of Economics and an Associate Fellow at Chatham House, UK**

Dimitri Zenghelis is the former head of the Stern Review team at the Office of Climate Change and was one of the authors of the Stern Review on the Economics of Climate Change. He is currently a Senior Visiting Fellow at the Grantham Research Institute on Climate Change and the Environment. ***Learn more about Mr. Zenghelis's work on page 48.***

Hon. Eileen Claussen, President, Center for Climate and Energy Solutions (C2ES); President, Strategies for the Global Environment

Arlington, VA
703-516-4146
http://www.c2es.org/

What event most shaped the course of the global environment?

Ms. CLAUSSEN: The present course of our global environment can be traced to the confluence of factors that spawned the industrial revolution. A steady progression of technological advances, coupled with the emergence of the free enterprise system, has bestowed enormous benefits on a growing global population. Yet many of society's material advances have come at the expense of the environment, from the accelerating loss of biodiversity to the disruption of our global climate.

Much of the growth achieved since the start of the industrial revolution has been powered by fossil fuels. From a climate perspective, the carbon dioxide released when these fuels are burned has been steadily accumulating in our atmosphere, driving up global temperatures, and setting in motion changes that we are seeing now in the rise of sea levels, the migration of species, and the increasing frequency and intensity of extreme weather events.

But just as we can see how we are changing the climate, we can also see how we can counter a global environmental threat. The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer is a key example of translating a dire warning from the scientific community—that continued use of chlorofluorocarbons (CFCs) as refrigerants and aerosol propellants would threaten the earth's protective ozone layer—into an effective global response.

The treaty is the first in the United Nations' system to have been ratified by all states (currently 197 with South Sudan). And it is working. With the global phase-out of CFCs and other ozone-depleting substances, the ozone layer is expected to fully recover by the middle of this century.

In addition to harming the ozone layer, CFCs are powerful greenhouse gases, so the Montreal Protocol has also made a significant, indirect contribution to reducing the risks of global climate change. The United Nations Environment Programme estimates that the phase-out of CFCs has reduced greenhouse gas emissions by 11 billion tons of CO_2 equivalent.

And the Montreal Protocol is still being put to work. China has just agreed to cooperate with the United States and most other nations in phasing down use of hydrofluorocarbons (HFCs), a potent family of greenhouse gases, under the Montreal Protocol. HFCs, which are used in refrigeration and air conditioning, currently contribute about 1 percent of total global warming, but with expanded use worldwide, they could account for as much as 20 percent by 2050. With China's cooperation, the prospects for adding a new chapter in climate protection under the Montreal Protocol have considerably improved.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Ms. CLAUSSEN: The policy approach that can most effectively and most efficiently reduce the greenhouse gas emissions causing global climate change is to put a price on carbon.

The full costs of fossil fuel use are not currently reflected in the prices businesses and consumers pay. Extreme weather—growing in frequency and intensity as a result of climate change—is costing the economy billions in business and personal losses. Economic damages from weather-related disasters climbed to near record levels in 2012, with 900 major events worldwide causing an estimated $160 billion in losses. In coming years, the public and private sectors will spend billions more to make our critical infrastructure—transportation, power distribution, water supplies—more resilient to the impacts of climate change.

A market-based approach that puts a price on carbon is efficient and effective because it spurs investment in innovative technologies and gives businesses flexibility to cut emissions at the lowest possible cost.

One form of carbon pricing is cap-and-trade—setting a cap on emissions and allowing emitters to buy and sell emission allowances. The European Union has led the way with its EU-wide emissions trading system. California now operates the world's second largest carbon trading system, and a growing number of other jurisdictions, including several provinces in China and the cities of Rio de Janeiro and Sao Paulo, are now developing or implementing similar programs. Over time, these individual efforts can coalesce into a linked global carbon market.

Other jurisdictions are pricing carbon through carbon taxes, which don't provide as much environmental certainty as cap-and-trade, but are also very efficient from an economic standpoint. A well-designed carbon tax can benefit the economy as a whole by taxing something harmful, carbon emissions, and using some of the revenue to lower taxes on things we want, such as jobs and investment.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

MS. CLAUSSEN: Addressing the challenges of a changing climate will require action at all levels—from individuals, business, and governments. In all three cases, the key is to understand the risks, the opportunities, and the solutions.

For individuals, increasingly intense and frequent extreme weather events and rising sea level can endanger personal property, livelihoods, and lives. One person alone may feel powerless to affect global climate change, but individuals can make a difference every day in the choices they make at home and at work. Simple steps, such as installing a programmable thermostat, taking fewer car trips, and buying products with the Energy Star or WaterSense label, can save energy, which reduces carbon emissions. Being a smart energy consumer is also an opportunity to save money. Individuals can also support and invest in companies that are leading the way in providing low-carbon solutions.

Businesses also face increasing risks from extreme weather, which can disrupt supply and distribution chains and power supplies, increase expenses, and damage facilities. For example, extensive flooding in Thailand in 2011 caused up to $20 billion in losses for automotive and electronics companies. Some companies are taking steps to address these risks through strategic planning, investing in infrastructure, and diversifying the supply chain, although past experience isn't necessarily a good predictor of future risk given a rapidly changing climate. Most importantly, companies have a key role to play in solutions to climate change by increasing energy efficiency, reducing greenhouse gas emissions, and developing and launching low-carbon technologies. Innovation in low-carbon technologies not only will protect the climate, but also will contribute to our energy security and national security, and drive U.S. competitiveness and economic growth. With world energy consumption expected to grow by 40 percent in the next two decades alone, low-carbon innovation is a growth opportunity that is good for a company's bottom line, and for the climate.

Although individuals and businesses can take meaningful action, governments must set the goals and provide the incentives needed to successfully transition to a low-carbon economy. At the national level, market-based policies can drive demand for clean energy while allowing the private sector the flexibility to choose the technologies and practices that meet it most cost-effectively. Additional policies, such as research and development support, are needed to advance critical technologies such as advanced biofuels, batteries that can store more energy for longer times, and carbon capture and storage. At the global level, governments are now working toward a 2015 deadline for a new U.N. climate agreement. With this new round, they have the opportunity to construct a more practical and durable international framework—one that is unlikely to deliver to a quick, sweeping solution but hopefully will encourage and facilitate progressively stronger national efforts.

BIOGRAPHY

Eileen Claussen is the president of the Center for Climate and Energy Solutions and Strategies for the Global Environment. Ms. Claussen is the former assistant secretary of state for oceans and international environmental and scientific affairs.

Prior to joining the Department of State, Ms. Claussen served for three years as a special assistant to the president and senior director for global environmental affairs at the National Security Council. She has also served as chairman of the United Nations Multilateral Montreal Protocol Fund.

Ms. Claussen was director of atmospheric programs at the U.S. Environmental Protection Agency, where she was responsible for activities related to the depletion of the ozone layer; Title IV of the Clean Air Act; and the EPA's energy efficiency programs, including the Green Lights program and the Energy Star program.

Ms. Claussen is a member of the Council on Foreign Relations, the Ecomagination Advisory Board, The National Petroleum Council, the Singapore International Advisory Committee, and the U.S. Commodity Future Trading Commission's Advisory Committee. She received an Honorary Doctor of Science degree from Loughborough University. She is the recipient of the Department of State's Career Achievement Award and the Distinguished Executive Award for Sustained Extraordinary Accomplishment. She also served as the Timothy Atkeson scholar in residence at Yale University.

Peter C. Fusaro, Chairman, Global Change Associates

New York, NY
212-316-0223
peterfusaro@global-change.com
www.global-change.com

What event most shaped the course of the global environment?

Mr. FUSARO: Rachel Carson's book *Silent Spring.* This brought environmental awareness to a global stage in the 1960s, prior to Earth Day 1970, which launched the spread of that awareness.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Mr. FUSARO: Cap and Trade for carbon emissions is the one policy initiative that has proven that market based solutions to emissions problems work. It remediated the acid rain program in the U.S. northeast and the urbane ozone problems in many U.S. urban areas, and it has been broadened to provide a global solution to man made emissions.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

Mr. FUSARO: Education is the only way forward, and frankly, there is also a demographic shift here as well, as younger people (under 35) throughout the world are much more engaged on environmental issues than are older generations. The policy debate has degenerated into an Us vs. Them mentality, and with too much emphasis on costs rather than environmental benefits. The benefits include better human health, which is almost unquantifiable.

BIOGRAPHY

Peter C. Fusaro is a best selling author, keynote speaker and thought leader on emerging energy and environmental financial markets. Peter is Chairman of Global Change Associates, a financial services advisory in New York City, and is the best selling author of *What Went Wrong at Enron* as well as 15 other books on energy and the environmental financial markets. He has been on the forefront of energy and environmental change for over 38 years focusing on how to use energy more efficiently and in an environmentally benign manner. His current focus is on environmental financial market acceleration to the goal of the low carbon economy through sustainable finance in renewable energy, clean technology, and carbon trading and finance. Peter was a partner in Energy & Environment Capital Partners, a cleantech venture capital fund in 2002–2003.

Peter's latest book was published in May 2010 by Oxford University Press on *Energy and Environmental Project Finance Law and Taxation: New Investment Techniques.* Peter has been selected for *Who's Who in America* for 2007–2014 and *Who's Who in the World* for 2009–2014. He coined the term "Green Trading" and holds the annual Wall Street Green Summit in New York each spring (www.wsgts.com), which focuses on energy efficiency, renewable energy, and clean technology.

Peter graduated with an MA in international relations from Tufts University and a BA from Carnegie-Mellon University. Peter is an adjunct professor at Columbia University where he teaches a renewable energy course. He is on the advisory board of Bard College's MBA in Sustainability and on the External Advisory Board of the ERB Institute for Global Sustainable Enterprise, Ross School of Business, University of Michigan.

Peter is advisor to several cleantech startups including advisor to BVP, an Irish cleantech fund focusing on early stage investments in Ireland. He is on a member of the board of directors of Carbon Trade Exchange and on the advisory board of CleanAir Technology (mobile sources of pollution), Mission Markets (environmental and SRI broker dealer trading platform), Geo Investors Fund (renewable energy infrastructure), SJF Expert Network (cleantech venture capital), and AtmosAir (indoor air quality appliance). He is on the advisory board of Antenna Group in San Francisco on cleantech strategic communications.

Kirsty Hamilton, Associate Fellow, Chatham House; Policy Head and on the Steering Committee of the Low Carbon Finance Group

United Kingdom

What event most shaped the course of the global environment?

Ms. HAMILTON: Can't say globally. Perhaps there was a seminal "event"; however, I'd guess pivot-points in debates may be tiers down from "global." On the "event" front on climate, perhaps the Toronto conference on the changing atmosphere was one such, in 1988, bringing together scientists and Ministers, leading to the IPCC, the UNFCCC, and the basis for the early Toronto target policies on climate (a 20% cut in global carbon emissions by 2005). But every "event" has its own history of collaborators, conversations, realizations that made it happen.

Speaking personally, I was given a copy of the Brundtland Report "Our Common Future" in 1988 when travelling in Australia. Of all the chapters, the one on energy stuck out as the place where the rubber hit the road. I was aware of acid rain, but hadn't heard of "the greenhouse effect" at that point.

A second thing that put finance on the radar, was reading a business news article in the early 1990s on the dangers of the derivatives market (pre-LTCM). It was couched in strikingly similar language about risk and positive feedbacks as climate scientists were using about climate change, the latter already divisive around science in the press. Two parallel universes. Fifteen-plus years later, when the 2008 financial crisis happened—the dominos, the unstoppable rips, the "casualties," the uneven pace, the lack of end—perhaps a glimpse of global ecosystem collapse.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Ms. HAMILTON: Systemic challenges need to be tackled, and that means joining relevant dots within the catchment area—both between the silos of policy (in as much as you see governments as having a pivotal role in setting public policy goals) as well as the cross-cutting issues—finance, governance, industrial policy, social policy, and right down at the level of network regulation. The waft and the weave. We'll have to be interested in understanding how others see the world—this means translation: different

languages, operational approach, how people ask and answer questions, as well as the technical and analytic issues. Finance and policy can be on different continents as it were. Bridging what can seem small gaps at this level needs concerted focus and is arguably essential if change is to be durable and robust as conditions change.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

Ms. HAMILTON: I don't think they are mired in indecisiveness per se, more mired in the politics, positioning, and often the asymmetry between the incumbents and the smaller sectors offering solutions. The vocabulary of support for "innovation" is not always matched with weight given to the innovators. At another level, there can be a lack of precision and understanding between the broad phrases of political discourse "the politics" and what actually motivates capital (in case the answer to the question above was a bit diffuse).

My current observation is that we need two things in parallel. We need to work at the sharp resolution of "where the damage gets done" if you like—in energy, this includes energy policy design, network regulation, wholesale market structure (supply and demand), as well as incentives or perverse subsidies: how finance practitioners see those factors; more broadly, others point to financial regulation and the factors that alter how institutions see risk and reward. We also need to extrapolate and offer insight from the bottom up to the generic debate—*climate finance, green growth, infrastructure.* Big generic arguments are essential to create a consistent if not single compelling direction. However, the generic and important isn't necessarily "operationalisable" for those expected to respond, e.g., investors. We risk wasting a lot of time that way. The turbulent, moving territory is bringing bottom-up and top-down closer together.

On a broader level, I think we risk much indeed if we ignore the fact that these are fundamentally deeply moral issues.

BIOGRAPHY

Kirsty Hamilton is Policy Head and on the Steering Committee of the Low Carbon Finance Group. The Group brings together senior energy finance practitioners from across the finance spectrum to engage with lead policy counterparts. Kirsty was involved in its establishment with its founders in 2010. It aims to provide a factual, non-partisan, perspective on conditions to attract capital, both broader market conditions facing investors and the sharp resolution of energy policy design, with significant investment focus on renewable energy.

Prior to this, in 2004, she developed the Renewable Energy Finance Project as an Associate Fellow at Chatham House, working with financiers at the intersection between policy and finance, to help bring about more effective 'investment grade' policy conditions (UK, EU, emerging markets in scope). This sought to bring a bottom-up evidence base from transaction-focused financiers on renewable energy investment issues, from which broader insights could be drawn on the role of policy for both UK/Europe and emerging markets.

She has 23 years' experience in international climate and energy policy and has been an Observer at the UN climate change negotiations for both environmental and, subsequently, clean energy business organizations. She has had invited positions on the World Economic Forum's Global Council on Sustainable Energy, and as an advisor to UNEP's Finance Initiative, and is on the Steering Committee of REN 21, the international renewable energy policy network. She has also been an expert reviewer and contributing author to the Intergovernmental Panel on Climate Change.

Kirsty was brought up in Scotland and has a BA (Hons) from University of East Anglia and, much later, a Diploma in Economics from Birkbeck University in London.

Mr. Rainer Hinrichs-Rahlwes, President of the European Renewable Energy Council (EREC); President of the European Renewable Energies Federation (EREF)

Belgium

BIOGRAPHY

Rainer Hinrichs-Rahlwes is currently the President of the European Renewable Energy Council (EREC), the Brussels-based umbrella organization of the European renewable energy sector. He is also the President of EREC's member association, the European Renewable Energies Federation (EREF), the voice of independent producers of energy from renewable sources, and he is a Board Member and the spokesperson for European and International Affairs of the German Renewable Energy Federation (BEE), the national umbrella organization of the renewable energy sector.

He is closely engaged in European policy development for renewable energies in the European Union as well as in his home country of Germany, and keeps in close contact with government representatives, parliamentarians, the European Commission, and other stakeholders. He is convinced that a complete shift of our energy system to renewable energy is necessary for the sake of energy security and climate protection and that it is technically and economically feasible—much faster and less costly than supporters and beneficiaries of conventional and nuclear energy are trying to make believe.

Rainer Hinrichs-Rahlwes has delivered speeches and presentations and participated in panel discussions all over the world on behalf of the organizations he is representing or advising and as an independent consultant. In this capacity, he provides policy advice and knowledge about sustainable renewable energy development and policies for scaling up renewables on local, national, regional, and global levels in order to facilitate their becoming the mainstream energy sources in the near future.

Representing EREC, he is a member of the Renewable Energy Industry Advisory Board (RIAB) of the International Energy Agency (IEA) and a member of the Steering Committee of the global Renewable Energy Policy Network for the 21st Century (REN21) with headquarters in Paris (France), which was founded as an outcome of the first International Renewable Energy Conference (IREC), the renewables2004 conference in Bonn. He is also a member of the WREN Council, the advisory structure of the World Renewable Energy Network/Congress.

Before engaging with the renewable energy sector in Germany and in Europe, from November 1998 to December 2005, Rainer Hinrichs-Rahlwes was a Director General in the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), in charge of renewable energies, climate protection and various other dossiers. As a representative of BMU, he was one of the two chairmen of the International Steering Committee preparing the first IREC conference, the renewables2004 in Bonn. After the conference, until he left the ministry at the end of 2005, he served as BMU's representative and a founding co-chair and later a member of the Bureau of the Global Policy Network, now known as REN21.

Rainer Hinrichs-Rahlwes has recently published the book, *Sustainable Energy Policies for Europe: Towards 100% Renewable Energy* (http://www.crcpress.com/product/isbn/9780415620994), in which he analyzes and evaluates climate and energy policies in Europe from the first steps of climate and energy policy development via the 2020-targets and provides an outlook for the upcoming discussions and decisions about a policy framework for 2030, including a binding renewable energy target. In his book, he argues that there is no economically or environmentally viable alternative to striving for a complete transition towards a fully renewables-based energy supply.

Cary Krosinsky, Principal at S3; Columbia University; Executive Director of the Network for Sustainable Financial Markets

New York

What event most shaped the course of the global environment?

Mr. KROSINSKY: There is no one event that has most shaped the global environment. We have entered the Anthropocene, and it is only in the last 100 or so years that mankind has figured out ways to do truly major damage at scale to the planet, whether via Nuclear weaponry or otherwise. We have caused mass extinction before as with the Passenger Pigeon or (almost) the American Buffalo, but it is accumulated use of fossil fuels causing climate change, that is the one single trump card overriding all other issues of concern. Honorable mention, of course, has to go to things like trashing the oceans, deforestation, and the industrialization of the food system.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Mr. KROSINSKY: This may sound controversial, but if we are being honest, we have too many people on the planet given the available resources. What is helping keep population increases down the most is economic advancements in the developed and developing world. And so, anything that brings more prosperity to regions of the world with rapidly growing populations likely gives us the best chance of finding some form of planetary balance. This needs be coupled with increasing use and commitments to renewable energy of course. I'm a great believer that capital can help drive the changes we seek and likely require, but it can only come from collective will combined with collective action and awareness of the systemic problems at hand.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

Mr. KROSINSKY: This is exactly the reason I teach and write. The indecisiveness mentioned in the question has been a result of intentionality. Demographic studies show that there are in effect three groups of people—folks who think systemically including issues of environmental import, folks who tend to want to ignore such things (each about 25%) and a third group of folks who care largely about the well being of their families, roughly half the population.

It is this third group that is most important. Disinformation is extremely damaging and successful (as is brand development and PR more broadly) and science has not been well translated into nonprofessional terms. Business schools still largely do not teach these subjects. The U.S. media that caters to the right constantly reinforces false views and the mainstream U.S. media encourages debate on issues that should be accepted as given, as is only the case in Europe. More awareness rising is needed, including translating science into digestible forms for nonpractitioners, as well as developing future pathways for finance to solve the problems we all face.

BIOGRAPHY

Cary Krosinsky is Executive Director of the Network for Sustainable Financial Markets (www.sustainablefinancialmarkets.net), an international, nonpartisan, nonprofit organization comprised of financial market professionals and academics, which provides guidance on fiduciary duty, climate finance, and critical missing checks and balances in global financial services. He is also a former member of the expert group that helped oversee and create the Principles for Responsible Investment, as well as a founder and director of the Carbon Tracker Initiative, and former senior vice president of Trucost, where he helped develop the respected Newsweek Green Rankings.

He teaches an MBA class on sustainability and investing at the University of Maryland's Robert H. Smith School of Business, and a class at Columbia University's Earth Institute now called Scenarios for a Sustainable World, which examines the question of whether and how sustainability can be driven through financial markets using positive methodologies. The Earth Institute has recently collaborated with the Robert F. Kennedy

Center for Justice & Human Rights to jointly launch a sustainable investing curriculum this fall, which Cary is helping to coordinate. He will also be one of the key academics involved, along with the Earth Institute's Stephen Cohen, Satyajit Bose, and others.

Cary frequently writes about sustainable investing, having co-edited two of the leading contemporary books on the subject, *Sustainable Investing: The Art of Long Term Performance* (Earthscan, 2008) and *Evolutions in Sustainable Investing: Strategies, Funds and Thought Leadership* (Wiley, 2012). In *Sustainable Investing,* he set out to define a more positive framework for investing with sustainability in mind than is largely practiced, and the field has started to move in this direction. *Evolutions in Sustainable Investing* is more of a granular look at fund managers, featuring 15 separate case studies, along with regional differences and a review of metrics, asset allocation, and future perspectives. Both books feature numerous contributions from many leaders in the field, including among others, Paul Hawken, Dan Esty, Nick Robins, Rory Sullivan, and Roger Urwin. The short eBook on the subject, *The Short Guide to Sustainable Investing* (Do Sustainability, 2013), is designed to be a quick read for mainstream investors interested in learning more about why and how applying sustainability to investing in a positive fashion is now business critical[·]. He is also the author of numerous other articles on sustainability and valuation, including well-regarded pieces on Apple and sustainability for Bloomberg and critiques of the Do The Math tour in 2012. He is a frequent speaker on various ESG subjects and advises corporations and investors regularly.

For more on Cary's extensive background and achievements, please see his LinkedIn profile, which is kept up to date.

[·]Editor's Note: See a review of *The Short Guide to Sustainable Investing* in this issue on page 77.

Julia Langer, Chief Executive Officer, Toronto Atmospheric Fund

Toronto, Canada

What event most shaped the course of the global environment?

Ms. LANGER: So many "events" have shaped the environment of our incredible, improbable planet. Bam! A meteor strikes, sparking tidal waves of climatic and biological evolution. Oops . . . genes mutate and previously unheard-of life forms emerge from the slime. Whoosh! Water vapor and carbon dioxide rise up and create our comfy envelope of life. But in a more modern context, it has been the ax and plow, seeds and pumps: agriculture has shaped our global environment in a pervasive way. The direct physical manifestations are obvious, having encroached on much of the world's forests, mangroves (aquaculture), and riparian zones. The indirect, downstream effects are increasing with scale—chemicals, soil erosion, loss of genetic diversity, and massive use of fossil fuels. Earth's population would certainly not have approached current levels without domestication and cultivation, and we all need to eat, so now it's about how, what, and how much.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Ms. LANGER: Given entrenched interests and expectations, habits and inertia, the most important policy initiative for addressing environmental challenges is "policy courage." As Al Gore is alleged to have said about solving climate change: there is no magic bullet only magic buckshot. Whether that's pricing carbon/pollution/waste/etc., banning carcinogens/low-density development/clear cutting old-growth forests/etc., setting energy efficiency/restoration/etc. standards, it requires policy makers to be principled, informed, and brave leaders.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

Ms. LANGER: We'll get there by doing because the antidote to indecisiveness is to see, feel, and understand that we'll have a better life and planet by facing the challenges, that living within the planet's means works better for most of us. "Most" is an important distinction because there will be winners but also some big losers (unless they can adapt and find the winning proposition) and that's where the courage comes in. People are increasingly concerned and affected by environmental challenges, and there is so much inspiration and creativity for solutions. Now it is about the will to act.

BIOGRAPHY

Julia Langer is CEO of the Toronto Atmospheric Fund (TAF), an arm's length agency endowed by the City of Toronto to advance low-carbon solutions for cities. While at World Wildlife Fund (WWF) she led campaigns to address climate change, protect marine turtles, and ban toxic chemicals. Julia served as a policy advisor to Ontario Minister of Environment Jim Bradley, and has worked and volunteered with many non-profit organizations including Friends of the Earth, Pollution Probe, Great Lakes United, and the Federation of Canadian Municipalities. She holds a degree in Environmental Sciences from the University of Toronto. Julia is a year-round cyclist, an avid vegetable gardener, and a wilderness canoeist.

Mr. Li Junfeng, President of Chinese Renewable Energy Industries Association (CREIA); Director General of National Center for Climate Change Strategy and International Cooperation (NCSC)

China

BIOGRAPHY

Mr. Li Junfeng is currently serving as the president of Chinese Renewable Energy Industries Association and Director General of China's National Center for Climate Change Strategy and International Cooperation. He is a member of China's National Energy Advisory Council, the Expert-Committee of National High-tech Program, and Academy Committee of China's Environmental Protection Ministry. He also serves as the vice-chairman of China Renewable Energy Society, a board member of Global Wind Energy Council, and the vice-chairman of Renewable Energy Policy Network (REN21).

Mr. Li has dedicated his 30-year career life to energy economy and energy environment studies. He was in charge of the structure and drafting of China's Renewable Energy Law and China's Medium and Long-Term Development Plan for Renewable Energy Development. He also participated in the research and drafting of China's Medium and Long-term Science Technology Development Program Outline, the draft of China's Energy Law, China's National Climate Change Program, and so on.

From 1999 to 2011, Mr. Li served as the Deputy Director General of Energy Research Institute (ERI), National Development and Reform Commission (NDRC) and the Chair of the Academic Committee of ERI for more than 10 years.

Mr. Li Junfeng's main publications are *Issues and Options of Green-House Gas Emission and Control in China*, *Assessment of Renewable Energy Technologies in China*, *Wind-Power 12 in China*, *Review of Chinese Renewable Energy Law*, and *National Strategy of Renewable Energy Development in China.*

Shilpa Patel, Principal Advisor, Climate Finance and the Private Sector Initiative, at the World Resources Institute; Senior Advisor to the Climate Business Department at the International Finance Corporation; Independent Consultant

United States

Ms. Patel's views reflect her personal opinions as a climate finance expert, and not those of her employers.

What event most shaped the course of the global environment?

Ms. PATEL: Climate change is the biggest challenge facing humankind today. The industrial revolution changed the course of human life, and of our environment. Within decades, massive productivity increases brought about by mechanization resulted in economic growth that was much better distributed; it allowed for advances in a number of spheres of human life, and improved welfare for many. However, it also marked the beginning of increasing environmental degradation. Coal began to replace wood and biomass as a source of energy; a growing demand for iron led to advances in metallurgy to support all that mechanization—and mining activity rose to meet those needs. We have treated our planet's resources as limitless, and have paid little heed to dealing with the huge amounts of waste that we generate. We have begun to pay the price for this disregard now, but our responses to a finite earth are too few and too timid. Mostly they have been limited to local level action, where the consequences of our recklessness are visible in polluted waterways, poor air quality, denuded hillsides, and ravaged landscapes. But CO_2 is invisible, and far too many of us do not even recognize the link between our use of fossil fuels and climate change. Most scientists agree that we need to limit atmospheric concentrations of CO_2e to 450 ppm in order to have a decent chance of containing global temperature rise to 2°C. We are already at 400 ppm, and increasing daily.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Ms. PATEL: We need to recognize that there is a cost to our use of resources because they are finite. We need to put a price on the externalities we generate. The single most important policy initiative that can begin to redress the imbalance we have created in the global atmosphere is a price on carbon. Ideally, we would have a carbon tax, and every activity that generates CO_2 would need to incorporate that cost. Quite apart from creating a more level playing field for alternative energy sources and energy conservation, such a tax would generate significant revenue that can be put to other productive use, or redistributed to cover the most vulnerable. In a utopian world, such a tax would be global, but in the meantime, border tax adjustments would be needed to not penalize countries that do institute carbon pricing. I do not mean to imply that this is a panacea, or that nothing else needs to be done, but this is in my view the single most important thing we could do for climate change.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

Ms. PATEL: We need to tackle this on two tracks. One is more effective messaging. Scientists, environmentalists, and policy analysts—people who approach the topic with a rational, science- or economics-based orientation—have so far led the discourse on climate change. Much of what we hear focuses on the terrible calamities that face us if we do not act. I'm not sure that "gloom and doom" is a winning strategy, however. Martin Luther King Jr. did not inspire the world by talking about his nightmare! Let's learn a lesson from the slick marketing campaigns of corporate giants—we really do need better messaging, and we need to figure out how to reach people at an emotional level. We need to impress upon all members of society that addressing climate change is truly the most important challenge facing the future of our planet. Let's find champions in every sphere of civil society, and get them to embrace the cause—so that they can in turn raise awareness with their constituents.

The other track is money. Money talks—as we have seen with the lobbying efforts of fossil fuel interests. Let's get those who control capital—endowments, pension funds, institutional investors—to really understand and act on the power they can wield in the

fight against climate change. If the investment community required investees to really quantify and explain the climate impact of their activities, if the investment community directed investments away from carbon-intensive activities, we could see some real impact on the ground. A vicious circle has set in today: governments are distracted by short-term problems and have dropped the ball on climate change; the market appears to doubt that climate regulations will be binding and therefore continues to finance carbon-intensive industry; big oil and fossil fuel interests make money hand over fist and can fund disingenuous misinformation campaigns (to put it mildly); the public is weary of messages of gloom and doom in some undefined future. We need to break this vicious circle.

BIOGRAPHY

Shilpa Patel is a climate finance expert whose work focuses on understanding how best to mobilize private capital for climate-related investments, thus helping countries move to lower-carbon growth trajectories. She is currently Principal Advisor at the World Resources Institute in their Climate Finance and the Private Sector practice, and Senior Advisor to the Climate Business Department at the International Finance Corporation. She is also an independent consultant for other financial institutions. Previously, she worked at the International Finance Corporation, where she headed IFC's work on climate change strategy and metrics, supporting the corporation's climate change agenda and commitment to increase its climate-friendly lending.

Ms. Patel helped build IFC's analytical capacity to better understand the climate change impacts of its activities, as well as the impacts of climate change on private business and IFC's operations. She was the key architect of IFC's portfolio greenhouse gas accounting initiative and on its metrics to better assess development and climate change trade-offs in developing countries. She helped launch IFC's first green bond and worked with institutional investors and other stakeholders to define green bond criteria and standards. Prior to this, Shilpa managed the Sustainability Business Innovator, an incubator for innovative investment activities that could demonstrate commercial viability and deliver environmental and social benefits.

Shilpa started her career in the World Bank, where she worked on private sector development across a number of sectors, regions, and economies in transition. In Morocco and Tunisia, she worked on structural reforms in the agriculture sector, including pricing

policy and credit, as well as on public enterprise reform. In Vietnam, she worked on market transition issues, with a particular focus on the modernization of the banking sector and the reform of the public enterprise sector. She also managed the Lao country program, and wrote the World Bank Group's Country Assistance Strategy for the country. Other notable activities that she headed include the conversion of the Subic Bay Naval Base in the Philippines to civilian use, which involved significant infrastructure repurposing and institution building.

In 1997, Shilpa moved to the IFC to work on the downstream oil and gas sector. She was transaction lead for several petrochemical projects in Brazil and Mexico, and handled a major restructuring effort for a large petroleum refinery in Thailand. Promoted to Manager of the Chemicals practice in 2000, she focused her efforts on building a strong pipeline of projects in India and China. She then moved to the newly created Health and Education Department, where she was involved in a number of innovative transactions, such as the first securitization of university tuition receivables in Chile and the first guarantee facility for K–12 school financing in Ghana.

In addition, Shilpa has held the position of Adjunct Professor at Georgetown University's McDonough School of Business, where she taught courses on Project Finance. She also served on the Board of Trustees of the Washington International School for four years.

Ms. Patel was born in India, grew up in Sri Lanka, Malaysia, and Mauritius, and speaks English, French, Spanish, Hindi, and Gujarati. She received a B.S. (Economics) and an MBA from the Wharton School of the University of Pennsylvania. She is married and has one daughter. She now lives in Washington, DC, and is a regular volunteer at Miriam's Kitchen, which provides hot meals and counseling services to DC's homeless.

Dimitri Zenghelis, Principal Research Fellow at the Grantham Research Institute at the London School of Economics and an Associate Fellow at Chatham House, UK

London, UK

What event most shaped the course of the global environment?

Mr. ZENGHELIS: Katrina, the Rio Earth Summit, Kyoto, the seminal work of climate scientists.

If we are to meet environmental challenges on a global scale, what one policy initiative do you think would have the most significant impact?

Mr. ZENGHELIS: None. For the world to transition to a low-carbon resource-efficient economy, policy must be integrated, coherent, and mutually reinforcing. There is no single magic trigger or bullet. In which case, the best overarching initiative would be a public awareness campaign focusing not just on climate risks, but on a clear line of sight as to what can be done to transition, and how economically efficient and innovative such a world might look. This would then provide the basis for a coherent policy push.

Given that the public and governmental debates on environmental issues are mired in indecisiveness, what do you think is the most constructive path to achieving active working relationships with all members of society?

Mr. ZENGHELIS: The most constructive path to achieve active working relationships with all members of society would be to move the debate out of the realm of the usual suspects (e.g., NGOs, environment ministries, eco-lobbies) to the realm of business and economics (e.g., finance ministries, the IMF and World Bank, and the financial press). This must be articulated as a growth story and not as an environment story. This is a prerequisite for fully engaging society, and helping to make it resilient to lobbying by commercial interests opposed to change.

BIOGRAPHY

Dimitri Zenghelis is a Principal Research Fellow at the Grantham Research Institute at the LSE and an Associate Fellow at Chatham House. He was recently Senior Economic Advisor to Cisco's long-term innovation group. Previously, he headed the Stern Review Team at the Office of Climate Change, London, and was a senior economist working with Lord Stern on the Stern Review on the Economics of Climate Change, commissioned by the then-Chancellor Gordon Brown. He continues to act as an advisor to the UK Government and to Lord Stern at the LSE. He is an Associate Fellow at the Royal Institute of International Affairs (Chatham House). Before working on climate change, Dimitri was Head of Economic Forecasting and Head of the Macroeconomic Analysis Branch at HM Treasury. He provided regular briefings to the Chancellor Gordon Brown and Prime Minister Tony Blair.

The Stern Review is widely acclaimed as the most comprehensive study to date of the economics of climate change. It was intended not just to inform UK policymaking—the UK makes up only 2% of global greenhouse gas emissions—but also to underpin discussions about the wider international policy framework and provide a common understanding of the key issues. Lord Stern's report was submitted to the Chancellor and the Prime Minister on 30 October 2006. Dimitri Zenghelis was lead author on the costs of mitigation, model analyses and comparisons, and "competitiveness" impacts, and a significant contributor to the conceptual, theoretical, and ethical framework adopted in analyzing the economics of climate change. He also led in disseminating and presenting the Review post-publication.

Prior to joining HM Treasury Dimitri worked as a consultant with Oxford Economic Forecasting, and at the Institute of International Finance, Washington, DC, on East Asian and Southeast Asia trade and investment flows, and macro economic policy. He also worked for Tokai Bank Europe, London. In the early 1990s, Dimitri was a Senior Economic Advisor for the Liberal Democrats, House of Commons, London. His university education was at St Hugh's College Oxford and Bristol University.

Dimitri is an artist and a published photographer. His interests range from architecture to philosophy of science, and despite being born with two left feet, he enjoys rock-climbing, skiing, and advanced nitrox scuba diving.

Environmental Investment in Community Forest Management (CFM): A Case Study of Mid-Hill Nepal

Raghu Bir Bista, Lecturer
Tribhuvan University, Nepal

Abstract

Environmental Investment in Community Forest Management (CFM): A Case Study of Mid-Hill Nepal

The environmental investment of a local community is an important financial aspect of community forest management (CFM) and governance. In Nepal, it is identified as the cost paid by the local community for its property rights, participation in forest management, and creation of opportunities for gaining alternative income, employment, and wood fuel as a source of energy. The increase in forest management and protection activities by local communities is reflected in an upward trend in investment. An objective of the government's community forestry management policy is to mobilize the local community in order to control the illegal access and "free ride" by members and nonmembers in the forest and to improve the socioeconomic level of the poor community.

This study is an empirical investigation of a local community's participation in community forest management and conservation in Mid-Hill Nepal through the use of descriptive statistics based on primary data sources. The results of this study show that the poor members of the community more than their wealthy counterparts invest in forest management and conservation. However, the return on investment—in economic benefits and forest products—is greater for the wealthy members.

Environmental Investment in Community Forest Management (CFM): A Case Study of Mid-Hill Nepal

The main objective of this study is to estimate the level of environmental investing by the local community in community forest management (CFM) in Nepal. Specific objectives in support of that goal are to assess the nature, characteristics, and size of environmental investments in community forestry; to examine the impact of different income groups on environmental investing; to ascertain the socioeconomic effects such investing has on the community forest user group (CFUG) institution and its governance; to identify significant issues; and provide policy suggestions.

This paper is organized into three sections. The first section introduces the concept of environmental investing in community forest management in Nepal, where the socioeconomically marginal, or low-income, group has invested in CFM. The second section explains the statistical method and source of data used in this study. The third section presents the case study of environmental investment in community forest management in Nepal.

The environmental investment of a local community is an important financial aspect of CFM and its governance. In Nepal, it is identified as the cost paid by the local community for its property rights, its participation in forest management, and the creation of opportunities for gaining alternative income, employment, and wood fuel as a source of energy. The increase in forest management and protection activities by local communities is reflected in an upward trend in investment. The investment grows annually in the community forest (CF) with respect to the growth of trees, their density, and their coverage, and it includes required regulations and risk management. Most individual members of a community forest user group (CFUG) regularly deposit, on average, US$2 per month in the Community Forestry Fund (CFF). They also provide mandatory labor endowments in tree management (nursery management, seeding, plantation cutting, and so on), and help to regulate the access of members and nonmembers to the forest during the day and night (KCF 2010).

In Nepal, many people participate in raising funds for environmental investment. Approximately 0.4 million members of CFUGs invest annually in community forestry by paying member fees and making labor commitments through the CFF, although the fund has various other resources, such as revenue from the sale of forest products and royalties and the financial support of local and national governments. However, the most

socioeconomically marginal and low-income group in the CFUG pays the highest cost for membership, although the government of Nepal portrays the community forest management program as a means of reducing poverty. The government has failed in its attempts to lower the cost of membership and to make an effective poverty reduction policy.

Environmental investment on the part of the socioeconomically marginal group within CFUG may be a critical issue in the course of poverty reduction, since the National Plan (2002–2010) and the Poverty Reduction Strategy Paper perceive the decentralization of local resource management as instrumental to poverty reduction. Community forestry, however, has proved to be a successful management system for forest conservation and utilization in the developing country of Nepal for the past 28 years (NPC 2010). In terms of CFM economics and ecological institutional economics, this issue presents some interesting questions concerning the role of impoverished people regarding the nature and size of their environmental investing, their perspectives and behaviors, the ways in which they could manage resources, and their effect on the CFUG institution and its governance. Until now, no literature has covered these issues and their socioeconomic implications.

Method

The study followed a descriptive and explorative research design to answer the following research questions regarding a group of impoverished people:

- What will be the nature and size of their environmental investments?
- What will be their perspectives and behaviors in relation to forestry management?
- How might the members manage their resources for investing in community forestry?
- What effects will they have on the CFUG institution and its governance?
- What might be the socioeconomic implications of their investments?

In the study, the socioeconomic characteristics of CFM user groups, the rate of the membership fee, the people's time allocations, and the institutional structure and practices were quantitatively described. In addition, through statistical tools and econometric models, study researchers explored the nature and size of environmental investment by the low-income group.

Source of Data

The case study of Kafle Community Forest (KCF), located in Lamatar, Lalitpur, is the basis for this paper. The KCF is the primary source of the data, which were collected from a household survey, observations of the KCF, and KCF meetings and in-depth interviews with the sample households. Supplemental materials include the minutes of the KCF executive body and General Assembly, the records of membership forms, the application forms and letters to the District Office and the Village Development Committee, the time log table, labor-contribution log table, fuel-distribution log table, and the reports and policies of Ministry, District of Forest, and Village Development.

Population and Sample

The household population figures came from the report of the District Forest Office, Village Development Committee, KCF records, and the ward population of the Central Bureau of Statistics (CBS). The stakeholders owning KCF came from 63 households. Out of 63 KCF households, 48 were selected randomly. This number accounts for approximately 70 percent of the population. Thus, the study sample consisted of these 48 KCF households.

Data Collection Method

The primary data sources of this study are the CF, the CFUG, household characteristics, and environmental investments. The data were collected from a household survey and group discussions with the Kafle CFUG. The Village Forest Range Post and the Executive Committee of the KCF user group (KCFUG) were both consulted before the survey.

The survey for this study was conducted by coding households during April and May 2010. The questionnaire used in the survey was divided into three sections: basic information about the household's socioeconomic situation, information about the household's participation in the KCF program, and information about the extent of the household's dependency on KCF

The study collected secondary sources for supplementary data concerning membership fees, labor time endowments, regulation, managerial activity, patrolling, and so on. The data set was collected from the minutes of KCF meetings and record books of members' labor and fees.

Statistical Tools

As stated previously, under the broad objective of estimating the level of environmental investment by the local community in CFM in Nepal, the study was undertaken to achieve four in-depth, specific objectives. The first objective was to assess the nature, characteristics, and size of environmental investment in community forestry. The second objective was to examine the impact of different income groups on environmental investing. The focus of the third objective was on ascertaining the socioeconomic effects on the CFUG institution and its governance. Finally, the fourth objective was to identify significant issues and provide policy suggestions.

In order to achieve the stated specific objectives, the study used descriptive statistical tools, particularly Arithmetic Means and Standard Deviation to present and analyze the nature, characteristics, and size of environmental investments in the community forest. In addition, similar statistical tools were applied to assess the impact of different income groups on environmental investment and their socioeconomic effect on CFUG.

Literature Review

Although the author is unaware of any literature that specifically covers the objectives and issues examined in this study, especially the socioeconomic implications, there is literature on related aspects of forestry and local communities. Much of this relevant literature can be divided into two categories. The first category covers the overall topic of community forestry. The second category could include some of the issues that relate to or are intertwined with community forestry: property rights, poverty, and the management of community forests.

Community Forestry

Klooster and Masera (2000) describe community forestry as the regime, or system, by which a local community manages forestry. Hardin (1968) and Ostrom et al. (2001) discuss the property rights of local communities within the regime. Taylor (1993) complements these views by arguing that local people are genuinely in control of the management of forest resources. Poenberger and McGean (1996), Messerschmidt (1993), and Utting (1994) find a similar approach in common resources management. However, Hardin (1968) observes a difference between common resource management and community forest management because of the issue of property rights. He refers to the tragedy of commons management, which comes from the overexploitation in forestry and

fishery, and misuse of water, public land, and air through *free riding* (situations in which those who benefit from a resource either do not cover a fair share of the costs or who consume more than their fair share of the resource). The absence of property rights leads to the depletion of natural resources inherent to forestry, fishery, water, public land, and the air.

There are multiple examples of institutional literature on common resource management that address the issue of free riding. The school of property rights argues that property rights should be given to local communities as an alternative measure meant to address the free-riding problem and to avert the tragedy of the commons. Hardin (1968) and Demsetz (1967), all advocate for this school of thought, although other voices argue for an emphasis on public regulation or volunteerism. In recent years, collectivism and institutional management are quite popular terms within the sphere of CFM.

Property Rights, Poverty, and Community Forest Management

The literature on common resource management cites poverty as a driver of free riding in open resource regimes and common resource management, and cites poverty as negatively correlating to the depletion of common resources.

The endorsement of property rights within common resource management presents an alternative opportunity for local communities to participate in forestry management and poverty reduction. The studies of Ostrom et al. (2001; 1994), Baland and Platteau (1996), and Bromley (1984; 1992) have revealed the role of property rights and collective action in the management of common property resources and the local community's level of participation. Moser (1996) saw the significance of recognizing property rights and the collective action taken by the local community to improve its capacity to earn and consume as ways to meet minimum living standards. A better quality of life could be achieved through collective behavior and supplementary income. Gibbs and Bromley (1989) and Chi (1999) further explain three primary objectives of CFM: improving the livelihood and security of the local people; enhancing environmental conservation; and empowering the local people. Thus, members of the local community, particularly the poorer ones, are passionate about becoming members of the CFM. Membership helps villagers earn supplementary income, engage in forest conservation, and gain socioeconomic empowerment.

In addition, some authorities argue in accordance with Chi (1999) that CFM has a higher rate of efficiency in resource management due to greater local knowledge, lower transaction costs, and better decision-making. They also believe that cost-effective local management and local knowledge of ecological dynamics supplement such programs.

Income expectation is the main determinant of massive local community participation in CFM practices and experiences. The Ministry of Finance (2011) notes that 0.4 million Nepalese actively participate in CFM as a means of acquiring an alternative income source. Bista (2011) and Pokharel (2008) have found similar results. CFM would be a great shock to local systems in terms of property rights, collective action, and community forest management. However, much of the existing literature mentions the local poor communities' sacrifice of labor, time, and financial resources as forms of environmental investment.

Nepal: Significant Geographic, Demographic, and Socioeconomic Background

Nepal is a small Himalayan country of 147,181 sq. km. About 885 km long, it has an average width of 193 km and is located between China to the north and India on the other three sides. The latitude is 26^{o} 22' N and 30^{o} 27' N and the longitude is 80^{o} 04' E and 88^{o} 12' (CBS 2009). Nepal occupies 0.3% of the Asian landmass and 0.03% of the world landmass (CBS 2009).

The country has a population of 28 million people (CBS 2007) and is noted for its geographic and ecological diversity. It spreads from lowlands of 60 meters above sea level to an altitude in the highland areas of 8,848 meters above sea level (ADB 2004). Between the lowland and highland areas are the Terai Plain (plain land) and Inner Terai, the Siwalik Hills, the Mahabharata Range Hills, and the Mountain Regions, which include the Middle, High, and Himalayan Mountain Regions.

The country's forests are richly diverse. Researchers have recognized thirty-five forest types (forestry studies of the Forest Development Master Plan 1980; Stainton 1972). Yet, from the perspective of ownership jurisdiction, forests were classified into only two forms: Public and Private (HMGN 1964). National forest statistics show that in 2002, 99.9% of the forests were designated as public forests, and 0.1% were private. Recently, this classification has been broadly divided into two main groups with subcategories: state owned—protected forests and religious forests; and people owned—community forests, leasehold forests, and industrial forests (HMGN 1986, 1993, 2005).

Knowledge of the socioeconomic background of Nepal is essential to understanding community forestry. The GNP per capita of this landlocked country is approximately US$642 (WB 2012) and its economic growth is less than 3% (MOF 2010).

Community Forestry in Nepal

Community forestry is a successful management system in developing countries**.** In Nepal, community forestry is a well-established practice, with 28 years of growth behind it (Chomitz 2006; MOF 2011). This management system has enabled *vertical and horizontal replicate growth* all over the country. Currently, the system is available in 1.35 million hectares of forestland, and it contributed to the return to 40% forestland coverage in 2010, up from 29% in 1992 (NPC 2010). Thus, this devolution of forest authority has been recognized as an effective and successful conservation policy effort and module.

CFM experienced a major evolution in Nepal, when, before the 1950s, ethnic and tribal communities initiated an approach that included property rights and community ownership. This type of community ownership was the traditional practice of the ethnic and tribal communities all over the country (Hobley and Shah 1996), but it became ineffective after the implementation of a nationalization policy to privatize forests in 1957. Subsequently, local communities lost their stake in the conservation, utilization, and management of forests in the country. However, the regulation of public authority (through the District Forest Office) could not stop the free riding of local communities, despite higher regulation costs. A higher rate of deforestation reduced tree density and coverage. In 1970, the government of Nepal again endorsed the use of community forestry policy and programs, devolving property rights in forestry to local communities. The policy seems to have been effective at both reducing the costs and increasing tree density and coverage.

CFM has four major components: (1) the local community's governance regime to conserve, utilize, and manage the forest; (2) the negligible costs of forest governance and the user group's fund; (3) the distribution of non-timber forest products (NTFP) for livelihood energy; and (4) the conservation of the forest and its local biodiversity. In addition, all members should pay annual member fees and contribute their labor to the forest governance. Furthermore, the community's governance encourages the poor to be involved in such practices for their own socioeconomic empowerment. Women are preferred in the governance roles. Thus, the local community is completely responsible for forest governance, management, and distribution.

The CF policy of 1993 established an objective to conserve forests and to address the poverty of local communities in the Mid Hill, where approximately 60% of the population is impoverished. The collective action of CFM could be a chance for the poor to become socioeconomically empowered. Simultaneously, the policy encourages active participation by local communities to manage forest resources and thus to fulfill their basic needs for forest products. In order to achieve these objectives, the users' group is legally recognized as a social institution formed to properly govern the community forest, to create an environment of collective action, and to implement the operational plan. In addition, the group is a self-governing autonomous body with the right to formulate rules, regulations, and programs. It has been given the authority to operate the fund and to generate revenues for the fund. Forest user groups can implement income-generating activities within a forest, such as the promotion of non-timber forest products and the establishment of forest-based micro-enterprises.

Community Forestry and Local Community Participation (User Groups and Households)

It is estimated that potentially 1,876,300 hectares of forested land and 1,585,800 hectares of nonforested land in Nepal can be developed as community forests. In addition, 2,313,100 hectares of Nepal's current national forests can also be considered potential community forests. As of March 2010, His Majesty's Government (HMGN) has handed over to more than 15,000 CFUGs a total of about 0.65 million hectares of state-managed forests for their development, conservation, management, and sustainable use. Through this process, about one million people directly benefit from being members of the forest user groups

The Case of Kafle Community Forest

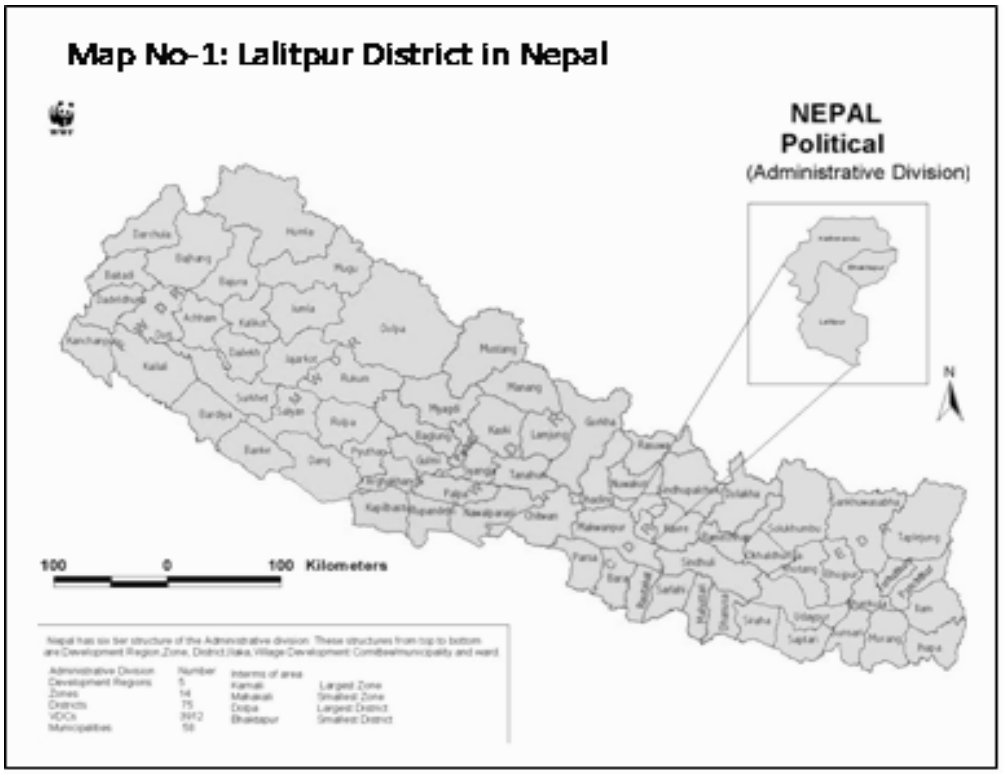
Each local community may have its own motives for developing a community forest. In the case of the KCF, there were only two motivations: to stop the tragedy of commons caused by free riding and to maintain sustainability of NTFPs (such as firewood, leaf litter, and grass) and water. The local community materialized its motives by establishing the KCF in accordance with the Forest Act of 1993. Approximately 63 households became members of the user group of forestry management. After a two-year-long process, KCF obtained legal status in 1994, when the District Forest Office handed over the Kafle National Forest to the community. The ownership and property rights of Kafle forest were transferred to the KCF user group.

Location of KCF

KCF manages a block of 96 hectares, involving 63 households of the Village Development Committee (VDC). The forest is located in Mathilo Khoriya Dada in the East, Gomati Khola in the North, Chisapani Peepal Tree to Bhihawar in the South, and from the main road to Khatri Bhajho in the West. The altitude of KCF ranges from 1,540 meters to 1,970 meters. To facilitate forest management and utilization, KCF is arranged in five blocks, such as A, B, C, D, and E, with areas of 20, 31, 27, 6, and 10 hectares respectively. The forest is dominated by mixed-type regenerated trees (District Forest Office 2002).

KCF in Lamatar Village is one of 162 CFUGs managing approximately 65% (9,923 hectares) of the community forest in Lalitpur District (Figure 1). The district is small; it is one of 75 districts lying in the central development region of Nepal.

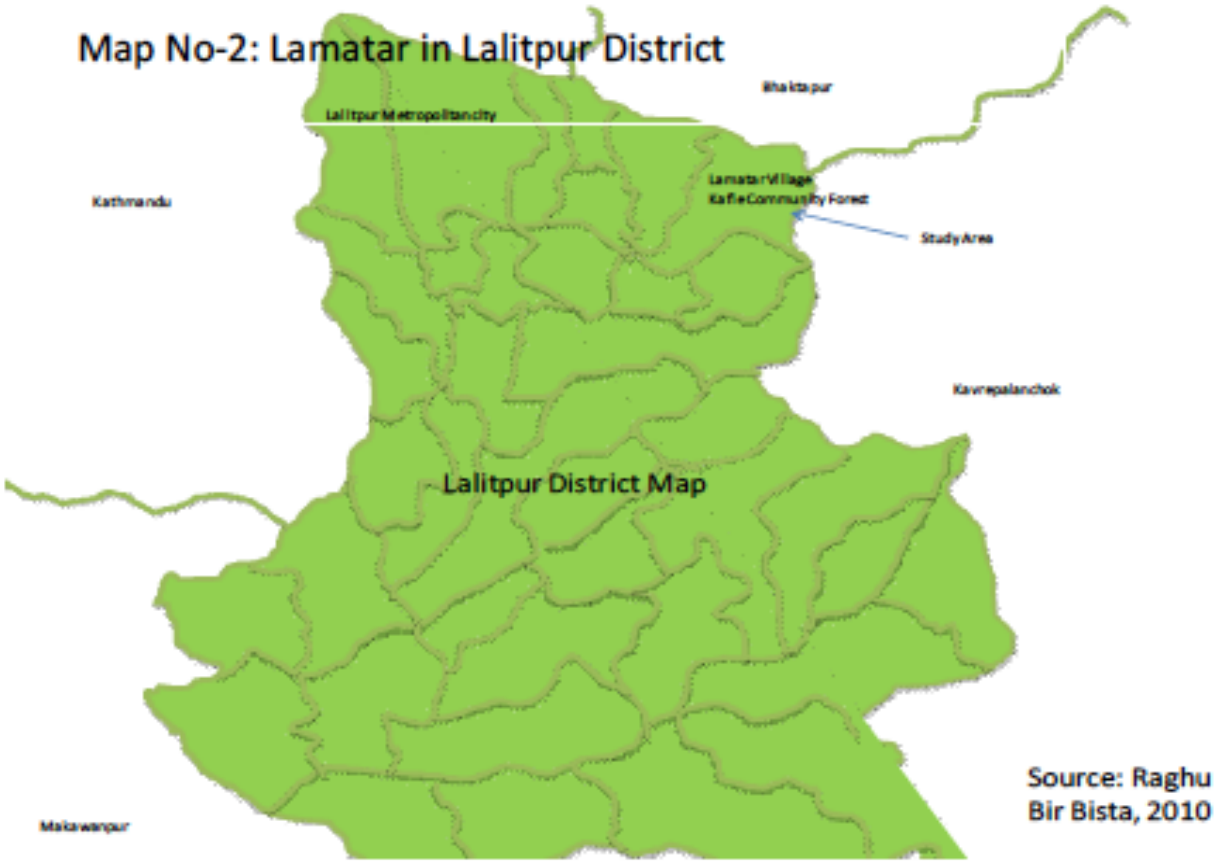
Figure 1: Lalitpur District in Nepal



Source: The WWF.

Justification of the Selection. This study focuses on Kafle Community Forest in Lalitpur District (Figure 2) for the following reasons: (1) the hilly CF possesses deforestation characteristics similar to those of many hilly forested areas worldwide, but has now implemented a successful "avoided deforestation" management program; (2) it has been selected for policy intervention programs; (3) it is one of the oldest community forests that has instituted best practices in community forest norms, values, and systems; (4) the area can be a source of reliable information regarding the socioeconomic characteristics of the households and forests; and (5) the area is easily accessible.

Figure 2: Lamatar in Lalitpur District



Characteristics of KCF

A reaction to forest-use experiences of the 1980s precipitated changes in the 1990s and the establishment of the KCF. Significant institutional and management procedures were implemented to run the KCF.

Institutional Characteristics. The concept of collectivism emerged on the community level as a means of promoting forest conservation after the Kafle forest experienced over-extraction and free riding under open access and a public regime of the 1980s. Those practices had serious consequences: a scarcity of important forest products—firewood, leaf litter, grass, water resources, and so on. As a result, the livelihoods of this forest-dependent community suffered. In 1993, the community collectively decided to set up the Kafle Community Forest User-Group (KCFUG) in accordance with the Forest Act of 1993. Under this common property rights regime (CPRR), the community became the owner of the Kafle forest for conservation, management, and utilization. The institution functions democratically through a General Assembly and Executive Body. All general members of KCF belong to the General Assembly. The group's major work is to reach collective decisions on policy, budget, and the election of the executive body according to the *KCF Working Plan* (KCF 2007). The Executive Body is a governing body of 11 members from the General Assembly. It executes the decisions of the General Assembly and holds monthly meetings. Its major work is to protect the forest and see to the proper utilization of forest products as well as other functional activities.

All the households near KCF identify as upper caste Brahmin but are heterogeneous in terms of socioeconomic level and status, despite being upper caste Brahmin. The majority of households have less than 12 months of food sufficiency. KCF is used for the livelihood objectives of the local people (KCF 2007).

Self and Collective Governance. KCFUG operates under a self-governance system. The members of KCFUG work together collectively to make and execute policy decisions, and thus foster transparency and effective community participation. In 2005, they prepared the Operating Plan of KCF for the next five years. Collective action is a golden rule in forest management; practicing it under the KCF plan has led to protection of the forest through patrols to stop illegal extraction and to oversight to ensure the proper distribution of livelihood forest products. Forest protection also includes the prohibition of domestic animal grazing, poaching of wild animals and plants, and illegal cutting, mining, and encroachment. Violation of these prohibitions will incur fines and punishments. Regarding the distribution of NTFP, the rules allow the extraction on a yearly basis of about 1,000 kg of green fuel wood, 500 kg of dry fuel wood, 500 kg of grass fodder, 1,000 kg of leaf litter, and 500 kg of nigalo (a kind of bamboo) every year. On special occasions, such as a marriage, religious ceremony, or funeral, any member is allowed to extract 350 kg of fuel wood for the same price. This plan was put in place for only 96 hectares of KCF.

Forest Management. Forest management, including cutting, cleaning, thinning, pruning, and planting, is a part of the collective action. The KCF land is divided into five blocks created for these activities with the support of nongovernmental and community-based organizations (NGOs and CBOs) and the District Office of Forestry. By using modern scientific techniques of forest management, the KCF governing body established a demonstration plot of 0.08625 hectares in 2002, and later extended it to 1.64 hectares. The plot was planted with 787 seedlings and 46-plot size NTFPs such as *Chialune, Jingaine, Hinguwa, Angari, Bakle, Laligurans, Lakuri, Saru* and so on (Figure 3). KCF had further extended the size of the model plot by planting different medicinal plants and other NTFPs. In addition, the group plans to develop the whole of Kafle Community Forest as a model community forest.

Figure 3: Kafle Community Forest

Household Characteristics of Stakeholders

It is useful to have a clear picture of the participating households in order to acquire a better understanding of how the people manage the KCF. Of significance to forestry management in particular is an accounting of the general resources that are available to the participating households and of how the people manage those resources, as well as an understanding of the attitudes and behaviors toward individual situations and forestry protection.

Households' Resource Endowments. There are two major resource endowments: land and livestock (Figure 4). Each household holds an average of 0.2 hectare in irrigated land and an average of 0.17 hectare in marginal land. Livestock resource endowments are conventional, which indicates the low number of potential resource endowments available to the households.

Figure 4: Households' Resource Endowments

Land Holding	Mean	Standard Deviation	Minimum	Maximum
Irrigated land	2.7	2.0	0.1	10.0
Marginal land	2.3	1.6	0.1	8.0
Livestock				
Cow/buffalo	1.57	0.5	1	2
Goat/sheep	2.73	1.5	1	6

Source: Field Survey 2010, Table No-1.

Household Size and Composition. The poor households generally have large families. However, the local average family size of 4.85 is less than the national average of 5.4 (CBS 2010). Furthermore, the wealthier families are smaller than those of the poorer and medium income groups (Figure 5). The outlier number is nine family members. So, smaller families may contribute less labor. Whether headed by males or females, the family composition of households is similar.

Figure 5: Household Composition and Demography

Household (HH)	Mean	Standard Deviation	Minimum	Maximum
HH size	4.85	1.42	2	9
Male	2.48	0.88	1	6
Female	2.46	1.009	1	5
Education				
Literate	4.45	1.54	1	9
Illiterate	1.04	0.21	1	2

Source: Field Survey 2010, Table No-2.

Household Economic Conditions. In accordance with the World Bank's estimates of the earnings per-day poverty reference line, 67.38% of the Kafle area households are poor (Figures 6 and 7), despite their higher than average literacy level. This estimate is also supplemented by a low food-sufficiency measurement. People living in this level of absolute poverty need alternative resources in order to establish sufficient livelihoods.

Figure 6: Poverty Scenario

Poverty	Relative poor	Absolute poor
Mean	5.06	14.17
Standard Error	0.419	1.31
Standard Deviation	1.6	4.18
Population	76	157
Percentage	32.62	67.38

Source: Field Survey 2010, Table No-3.

Figure 7: Household Socioeconomic Condition

HH Categories	**No. of HH**	**Average**	**Average Food Sufficiency**	
		Size of HH	12 month	Less than 12 month
Economic				
Poor	12	4.9	4	8
Medium	25	4.9	8	16
Rich	11	4.58	4	8
Education				
Literate	45	4.35	15	29
Illiterate	3	0.5		3
Gender				
Male	45	2.37	12	26
Female	3	2.45	3	6

Source: Field Survey 2010, Table No-4.

Perspective and Behavior of the Poor Households. The rate of household participation in forest protection is 85.3%, followed by forest management at 84%, development activities at 82%, resource utilization at 76.6%, decision making at 73.0%, and training at 55.99%

(Figure 8). These measured values indicate that households participate effectively in both their labor contributions and attendance.

Figure 8: Household Participation in Percentages

Participation	Higher	Medium	Lower	None
Decision Making	29.5	43.2	25	2.2
Development Activities	28.8	53.3	17.7	
Forest Management	27.2	56.8	15.9	
Forest Protection	29.2	56.1	14.6	
Resource Utilization	16.2	60.46	16.29	6.9
Training	15.9	40.09	34.09	9.09

Source: Field Survey 2010, Table No-5.

Livelihood Resource Management in Poor Households. In Nepal, the community forest is perceived as an alternative resource for improving the livelihoods of the local poor people (Ninth Plan 1997). Each member of the KCF annually extracts an average of 16.4 bhari (656 kg) of firewood, 4.4 bhari (176 kg) of grass and 7.6 bhari (304 kg) of leaf litter. However, there are extreme extractions: 100 bhari (4000 kg) of firewood, 40 bhari (1600 kg) of grass, and 50 bhari (2000 kg) of leaf litter (Figure 9). A member can extract additional forest products for a nominal charge. The cost of firewood extraction is higher than that of leaf litter, grass, and so on. However, an additional time allocation is not required to extract these products. Members claim 70% less energy expenditure from firewood than from other fuel sources.

Figure 9: Statistical Descriptive Summary of NTFP Extraction

Forest Product	Minimum	Maximum	Mean	Standard Deviation
Firewood	0	100	16.4	18.0
Grass	0	40	4.4	5.6
Leaf Litter	0	50	7.6	12.9

Source: Field Survey 2010, Table No-6.

Similarly, the availability of water resources is a positive externality for the community. It is supplied to all member households at no cost.

The KCF annual revenue from the sale of timber and NTFPs is Nepalese rupees (NPR) 182, 797.9 (US$2405). The average share of KCF income per member is higher than that

of workers in the service and agriculture sectors (Figure 10). Thus, it appears that KCF supports the livelihoods of its member households.

Figure 10: Annual Income of Sample Households from Different Sources (NPR)

Income Source	Minimum	Maximum	Mean	Standard Deviation
Service	0	726,000	179,958.3	133,483.1
Agriculture	-1000	268,800	41,122.55	46,675.5
CF	73,000	328,500	182,797.9	52,003.4
Total	72,000	1,323,300	403,878.8	232,161.9

Source: Field Survey 2010, Table No-7.

The Nature and Characteristics of Environmental Investment. An important element in the success story of KCF is the investment of the local community. Such investment, which has two main parts—the labor endowment and the membership fees of the local community—, has not yet been accounted for significantly. The members' labor is allocated to various activities, including meetings, plantation work, training, cleaning, patrolling, and administrative duties.

In KCF, approximately 63 family households are members of user groups. In other words, they are stakeholders. Every stakeholder member contributes 32 working days annually, which are reserved for meetings, plantation work, training, cleaning, patrolling, and administrative activities (Figure 11). Out of the total number of working days committed to labor, nearly 44% is allocated specifically to patrolling. Aggregately, all member households contribute 2,016 days to the KCF; 70% of the low-income family groups' labor contribution is higher than that of the high-income family groups. This is because the resources and income derived from KCF meet more of the low-income groups' livelihood needs.

Figure 11: Daytime Allocation per Capita per Annum (Days)

Activities	Minimum	Maximum	Mean
Meeting	1	27	6
Plantation	0	12	3
Training	0	15	3
Cleaning	0	45	6
Patrolling	0	48	14
Administrative	0	16	2

Source: Field Survey 2010, Table No-8.

Effect of Environmental Investment in CFUG Institution and Governance. The labor endowment is a big investment in KCF conservation, utilization, and management, although the members' marginal productivity of labor is nearly zero because of zero opportunity cost. The market wage rate in the urban labor market is NPR 500 (US$6.57) per day for an eight-hour working day. In terms of money, every KCF stakeholder annually invests NPR 16,000 (US$210) in KCF. In total, it will be about NPR 128,000 (US$1421) per annum. The low-income group shares NPR 75,600 (US$994). This amount is greater than that of the wealthier stakeholders. [Editor's note: Conversion rates have changed since these figures were first determined.]

In addition, members of the user groups pay NPR 200 (US$2.67) per year as an environmental investment toward KCFUG's sustainable governance and management. The total member fee per year is NPR 12,600 (US$165). This nominal amount is deposited in the KCF fund. The effect of the environmental investment in the CFUG institution and its governance is significantly positive: the group has created a strong institution and effective governance that supports forest conservation while also helping to reduce poverty.

Socio-Implication of Environmental Investment: The major objectives of the Community Forest Management policy and program are achieved by establishing the property rights and decision-making participation of the poor. These objectives are also four arguments that can be made in support of practicing CFM: poverty reduction, forest conservation, collectivism, and conservation (which has the least transaction cost). If we consider these arguments as indicators and measures of effective management, a strong institution, and good governance, CFM seems to be a successful model of forest conservation.

In this successful story of CFM, there is an excessive environmental investment by the poor community of stakeholders in forest governance, management, and institutional responsibility, since most of the stakeholders who perform this work are from low-income groups. In KCF, those member households from low-income groups that have inferior assets and lower levels of education and skills also have inferior surplus labor; in other terms, they have zero marginal cost because of a lower opportunity cost, although they desire to use their "inferior" surplus labor to achieve alternative incomes. However, they lack access to a well-developed labor and commodity market, enterprise development, information network, and even a reliable roadway network. Their leisure time is often just time wasted. In this situation, KCF has provided alternative opportunities through forest conservation and management. To some extent, surplus labor has increased productivity and production. Its positive externality can be found in CFM, constructive activities, network development, community development, and capacity building. In KCF areas, construction of a well, temple, school, and health post have been undertaken, and work on

road extensions and improvements is underway. Ultimately, the environmental investment has had positive socioeconomic effects on the local society.

Conclusion

Collective governance by the local community in the form of CFM is a key policy instrument adopted by the government of Nepal in order to protect forestry for livelihood objectives. This system of governance is acknowledged to be a successful enterprise in forestry management in terms of forest rehabilitation and the participation of the local community.

In KCF, poor households are more dependent on the CF for NTFP. Their share of forest products is approximately 45 percent. They contribute more labor hours to forest management and conservation. Participation in forestry conservation dominates the amount of time spent by the local community in the different layers of forestry governance. In addition, member households draw income benefits from KCF worth more than the income earned from the agriculture and service sectors.

As revealed in the study, poor households provide labor as a form of environmental investment in KCF governance and management more often than do rich households because the poor do not have the ability to pay money against labor endowments. Each low-income household contributes 32 working days in the KCF for conservation and management activities (meeting, planting, training, cleaning, patrolling, and administrative activities). In terms of their wages, the study estimates NPR 16,000 (US$210) per person. As an aggregate figure, this would amount to NPR 128,000 (US$1421) per annum. The low-income group shares NPR 75,600 (US$994), which is a larger amount than that received by the wealthy households.

In conclusion, local community households invest directly and indirectly in CFM. In KCF, local member households make a large environmental investment. Low-income groups invest NPR 16,000 (US$210) per annum in the form of labor endowment. The aggregate investment in KCF by the large low-income groups is greater than that of the minor high-income groups. Therefore, the poor invest more in community forest management.

Such investment has a positive impact on CF management and governance for forest conservation. In addition, the investment has increased productivity and labor in both conservation and community development. Therefore, the environmental investment of the poor households is significantly positive for sustainable forest management and in the reduction of greenhouse gas emissions, although the size of the environmental investment is small. Thus, the poor community is contributing a small monetary value of labor at a local level to the global climate-change mitigation efforts.

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Acronyms and Abbreviations

CBO	community-based organization
CBS	Central Bureau of Statistics
CF	community forest
CFF	Community Forestry Fund
CFM	community forestry management
CFUG	community forest user group
CPRR	common property right regime
HMGN	His Majesty's Government of Nepal
KCF	Kafle Community Forest
KCFUG	Kafle Community Forest User Group
NGO	non-governmental organization
NPR	Nepalese rupee
NTFP	non-timber forest products
VDC	Village Development Committee

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Biography

Raghu Bir Bista is an economist serving as a lecturer of economics in the Department of Economics, Tribhuvan University, Nepal. He teaches policy economics and development economics at the postgraduate level. He is a member of the advisory board of the *International Journal of Women’s Entrepreneurship and Education* published by the Institute of Economic Sciences, Belgrade. He has been involving in various research projects and publications. He has published three books: *Foreign Direct Investment in Nepal*, which was published by CIDS in 2005. This was followed by *Economics of Nepal* in 2008 (published by Hira Books in 2011) and *Global Role of Nepalese Forest* in 2010 published by Lambert Publication, Germany, in 2010 (available from Amazon). In addition, he has published the peer reviewed paper: “Low Carbon Economy and Developing Countries: A Case of Nepalese Forest” in the book, *Advanced Analytics for Green and Sustainable Economic Development* edited by Zongwei Luo and published by IGI Global, 2011, USA. Mr. Bista can be reached at bista3[at]hotmail.com.

Book Review

The Short Guide to Sustainable Investing, by Cary Krosinsky; Oxford, UK: Dō Sustainability, 2013, 74 pp., $58.53 (paperback); $45.00 (eBook)

Reviewed by Brittany Magouirk

Dō Sustainability publishes three to five short eBooks a month on a variety of sustainability issues, and encourages readers to suggest topics not yet covered. Readers can purchase eBooks individually or purchase a subscription to the Dō Sustainability's e-library. In keeping with the DōShort series style, *The Short Guide to Sustainable Investing* is a quick, to-the-point read. In just 74 pages, Cary Krosinsky is able to provide a comprehensive assessment of sustainable investing, explain how we got to where we are, and suggest where we are heading. The concise and informative style of the DōShort series makes it a perfect companion for quality Saturday morning reading.

For Financial Analysts

The references and language Krosinsky uses make for easy reading for financial analysts and fund managers. As a recent MBA graduate with a fundamental understanding of finance, I still found myself reaching for my corporate finance core principles textbook. Especially regarding Krosinsky's confident advice on building a long-term portfolio, I wanted to refresh my memory on the efficient capital market hypothesis and the value of dart throwing when it comes to building a portfolio to manage. While still contested, the efficient capital market hypothesis states that the value of the stock market is instantly reflected in the price, and picking stocks at random, even by throwing darts at the Wall Street Journal, could build a better portfolio.

While Krosinsky offers a detailed plan for building a profitable sustainable portfolio, I cannot help but be cautious, given my fundamental understanding of efficient markets. The price of stocks today takes into account all available information, including

investments already made in R&D and new product development. The overarching theme in his proposed portfolio is companies innovating sustainable solutions. An obvious metric that offers support to his argument is the comparison of the flat S&P 500 for 2011 with two separate lists of innovative companies that were up six percent in the same year. He encourages investment in these companies, not just because they are profitable in the long term, but also because, as investors, we should reward these companies' efforts with our investments. Despite my cautious outlook, I believe he made a strong argument for investing in innovative companies, and I am sure the author would agree that those portfolios should be updated to reflect companies that continue to innovate.

Global ESG Reporting Standards

Krosinsky does make some rather bold statements worth considering. He cites the Ten Principles of the United Nations Global Compact. He admires its comprehensive ambition, but regretfully acknowledges that it is not enforceable through a global mandatory audit body. He references the efforts of the International Integrated Reporting Council's (IIRC) Prototype Framework, the GHG Protocol, and the Sustainability Accounting Standards Board (SASB) to standardize the ESG impact reporting. However, it still stood out to me that he wants an enforceable global standard ESG impact report, when he must be fully aware that global businesses do not even have the same financial reporting standards. I can understand his call for transparency in businesses for investors, but I think one standard for the world is too impracticable a solution.

The Ease of the eBook

The advantages of the web-enabled eBook complement Krosinsky's high-level writing. He references and usually footnotes examples that I was not familiar with. Fortunately, most of Krosinsky's footnotes are hyperlinked to web pages. Seamlessly, I could click on a footnote to further explore his references that interested me. I was easily able to read analyst insight on responsible investment screening from Parnassas Investments. I explored emerging markets index performance on MSCI's website. Though I could follow footnotes to PDFs on my laptop, the browser on my Kindle Paperwhite could not support it.

Other references Krosinsky makes to sustainability issues that are not explicitly footnoted whetted my interest and spurred me to learn more. I explored GE's ecomagination initiative and learned about its smart grid, as well as the winners of GE's ecomagination challenge. One business team called *e.quinox* created renewable energy kiosks for developing countries. Krosinsky also mentions the water challenges the beverage industry faces. I wanted to know more and found a great New York Times article about the efforts of Coca-Cola and other companies. While beverage companies have controlled

water usage at a factory production level, the water usage at the agriculture level is a greater challenge because of the disconnected relationship between the farmers and factory production.[1]

Encouraging Further Exploration

Krosinsky offers this condensed guide of sustainable investing for interested analysts and investors. Though abbreviated, his work shows and shares his deep expertise in this subject. He encourages his readers to explore further with resources and references laced throughout his book. Whether referring to the history of global business, which he insists is not covered in business school, or Domini's international fund that considered accident and safety violation data and thus avoided investing in BP before the Deep Water Horizon Rig Spill, his writing kindles the desire to learn more about sustainable investing and where to turn for solutions.

The Short Guide to Sustainable Investing could take you the suggested 90 minutes to read through, or you could find yourself, like me, stretching it out as long as you would like.

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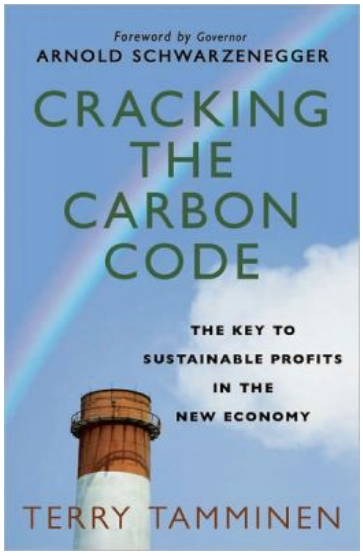
Brittany Magouirk is a Senior Consultant at Kalypso, an innovation consulting firm, where she helps clients deliver on the promise of innovation. She earned her MBA from University of Southern California's Marshall School of Business. She can be reached at brittany.magouirk@kalypso.com.

[1] http://www.nytimes.com/2011/03/22/business/energy-environment/22iht-rbog-beverage-22.html?pagewanted=all&_r=0

Book Review



Cracking the Carbon Code: The Key to Sustainable Profits in the New Economy, by Terry Tamminen; New York: Palgrave MacMillan, 2011, 172 pp. $30.00 (hardcover); $15.00 (eBook)

Reviewed by Logan Yonavjak

California's Landmark Global Warming Solutions Act (AB32): A Paragon for Climate Legislation

Cracking the Carbon Code can almost be viewed as two separate, but very complimentary books. Chapter 1 provides a concise, but intimate overview of Terry Tamminen's experience as an advisor to Governor Arnold Schwarzenegger during the passing of the landmark AB32 "Global Warming Solutions Act" in 2006. Beyond California, under Tamminen's watch, dozens of U.S. states, in addition to Canada and China, became vested in various carbon reduction policies and initiatives that are in various stages of development today.

Chapter 2 and the remainder of the book are devoted to the author's innovative and straightforward framework for how a company can begin to address cutting and managing carbon emissions over the short and long term. Throughout this informative book, Tamminen demonstrates leadership and strategic thinking that leave readers persuaded that cutting emissions is a win-win for the economy, their individual business, and the environment.

Enterprise Decision-making in lieu of Climate Change

Businesses, governments, and individuals are all trying to figure out how to navigate the challenging and dynamic environmental and economic implications of climate change. Suffice to say, these impacts are fundamentally altering decision-making at every level of society and will continue to do so. However, the scientific consensus is clear: we need to quickly decarbonize our economy if we want to avoid the most extreme negative impacts of climate change.

Even if business and policy leaders acknowledge the reality of climate change and the general implications for the New Economy (Tamminen makes the assumption that they mostly do), this usually means everyone has his or her own opinion for how to specifically navigate the decision-making, or, alternatively, has no clue where to begin.

According to Tamminen, "this dizzyingly varied jumble of people, places, concepts, and acronyms are all oddly shaped pieces of a mosaic that, taken together, equal a new owner's manual for the economy of the 21st century."

This new owner's manual, along with "hundreds of new laws, incentives, politics, inventions, Nobel Prize winners, science debates and disappearing natural resources," all add up to something Terry Tamminen has deemed the "Carbon Code." Sounds confusing, right?

Cracking the Carbon Code

How are businesses, governments, and individuals, especially those with little background in science, supposed to make sense of all of this, particularly as it affects their specific needs? Again, without a clear roadmap, confusion and apathy can ensue. Tamminen's goal in *Cracking the Carbon Code*, is focused on helping decision makers decipher this code.

Viewing low-carbon approaches as a necessary evolution in our economic development, Tamminen professes that "those who crack the Carbon Code will be able to spot the companies and technologies that are to the new low-carbon economy what Microsoft and Apple were to the information technology revolution of the 1980s." In other words, we're entering a new phase of the global economy, and smart businesses recognize this whether they like it or not.

Laying the Framework

Instead of feeling like a burden, Tamminen's writing style makes the de-carbonizing process feel like a game, or at least an invigorating exercise for those interested in getting ahead of the curve. Eventually, he argues, all companies will have to adopt some form of carbon mitigation, or be out-competed.

First, he strategically frames the Carbon Code roadmap around companies using carbon (which refers to the six "greenhouse" gases emitted from decaying materials and the combustion of fossil fuels) as a yardstick to measure their progress in improving efficiency and eliminating waste, in essence taking control of their destiny in lieu of climate change. This way, he intelligently puts the onus directly on the decision-maker.

Moreover, this roadmap isn't just important for direct emitters of carbon, like coal-fired power plants, it's relevant for a wide range of stakeholders, including businesses, investors, shareholders, governments, and consumers. After all, Tamminen argues, doesn't every organization want to cut waste and improve efficiency? What better way to do it than by using carbon as a yardstick? Tamminen believes that once enterprises learn the process, more will see the light and jump on the bandwagon.

The Historical DNA of the Carbon Code

Before breaking down the roadmap, in the very first chapter, Tamminen sidesteps any debate or discussion about whether climate change is happening and, thankfully begins the book with a brief and informative history of the people and steps responsible for the development of the "historical DNA" of the Carbon Code, instigated by the passage of California's AB32 law (the Global Warming Solutions Act of 2006). As I learned in greater detail, this legislation essentially laid the groundwork for catalyzing other statewide and regional support in the United States and international support in China and Canada.

Tamminen, who originally served as secretary of the California Environmental Protection Agency (and was then appointed to Cabinet Secretary, Chief Policy Advisor to the Governor) was in the thick of the development and passage of AB32 with Governor Arnold Schwarzenegger (who wrote a very motivating foreword for the book, and drew an analogy between Cracking the Carbon Code and a bodybuilding workout). This section

provides a more intimate understanding of the political maneuvering required to get this landmark legislation passed in the Golden State.

It was also interesting to hear a detailed account of Tamminen's interactions with President Obama during his first presidential campaign, as well as how he helped persuade Vice Minister Xie Zhenhua of China to create energy efficiency goals and launch a new subnational carbon registry similar to the Chicago Climate Exchange, beginning in Jiangsu province. (At the time Xie Zhenhua was China's chief delegate to the UN climate negotiations as well as the vice minister of the National Development and Reform Commission.)

The Roadmap

After the brief historical overview, Tamminen moves quickly into the core material of the book, which consists of a five-step process that companies can take to become more efficient, sustainable, and competitive in the global economy. Through these steps, Tamminen reminds business leaders that lowering emissions can mean lower risk and potentially higher profits:

1. *Time Your Carbon Tipping Point: Deciphering regulation and business trends that determine when carbon concerns will reach your doorstep.*
2. *Build a Fence: Measuring your company's carbon "footprint" and deciding what emissions you must accept as part of your responsibility—and which ones are someone else's.*
3. *Cut the Carbon: Reducing your company's carbon emissions in the most cost-effective manner and unlocking hidden "carbon assets" that may generate new revenues.*
4. *Manage What Can't Be Cut: Mitigating risks associated with a price on carbon, including the secrets to entering the carbon credit markets.*
5. *Estimate Carbon Resilience: Evaluating the long-term prospects for your company's carbon footprint and learning to adjust accordingly. This step includes understanding benchmarks for continuous improvement by comparing your company's carbon performance against others in the industry—and learning to stay ahead of the pack.*

Tamminen embeds each section of the process with examples from companies that have successfully cracked the Carbon Code and also with those that are still struggling to master the lessons; he aptly calls them "winners" and "losers." He walks the reader

through key questions in each section that can guide a high level analysis of how to cut emissions. For instance, in Chapter 1, the key questions to consider are:

1) *When will my business or industry be regulated?*
2) *When will customers demand that I deal with my company's carbon footprint?*
3) *When will the impacts of climate change affect the assets or business model of my company?*

Although seemingly straightforward questions, they can be difficult to answer, depending on the context. In the United States, for example, electricity companies are the first to be targeted because utilities can pass new costs on to consumers under structured rate programs that are typically controlled by public utility commissions or city councils. Their purpose is to prevent sudden rate spikes that might otherwise disadvantage either businesses or low-income consumers. However, other industries may not see regulation for some time, including ethanol and industrial landfills.

Also, companies need to think beyond regulation when planning their decision making for climate change. Customers and the general public may demand to know and see evidence of efforts to reduce companies' and product and service carbon footprints ahead of regulation.

Even if a company is not receiving pressure from customers or the general public, there is still a need to evaluate how the impacts of climate change may affect their business assets or the overall business model. After timing the carbon "tipping point," the second step is for companies to actually measure their direct and indirect emissions and figure out a way to publicly record this carbon footprint that can comply with both government regulations and public expectations.

The third step involves the work of actually cutting carbon emissions. Tamminen highlights energy efficiency measures as the most strategic focus area for companies—with the most benefits coming from lighting, motor efficiency, appliances, and building insulation.

In what he deems the process of "leasing the sky," the fourth step that Tamminen outlines involves managing what can't be cut directly by buying a combination of allowances and offsets, or just hedging your bets.

And, after a company has gone through the work of timing, measuring, cutting, and managing, it has to continue evolving. The final step in Tamminen's process requires continuous improvement and evaluation. Companies can't stop after they've gone through

the first four steps, they must look at their "Carbon Financial Resilience" over the long-term, evaluate areas of "Hidden Carbon," and measure themselves against others in their industry to stay competitive and realize all the benefits of measuring and managing their carbon.

Recognizing Increased Profits and/or Lower Risks

Throughout the book, Tamminen reminds readers that all the companies he highlights have only begun to crack the code, but are often recognizing increased profits and lower risks to their business. He urges companies to reframe the situation and see an opportunity for businesses to use carbon as a measure of efficiency, and, by reducing waste, increase profits. These examples make the reader feel less daunted, and even excited, by the opportunity to de-carbonize.

Tamminen is very skillful at reframing the carbon issue as an opportunity for businesses. As an example, in Chapter 2, page 27, he poses the question in relation to a national carbon tax, "a price on carbon would essentially be a cheap insurance policy. In fact, businesses spend billions each year for insurance to offset risks that are far less likely to impact their bottom line—because it's good risk management."

Another valuable aspect of the book is Tamminen's recounting of past tipping points in the economy and the inevitable business backlash against change—once companies see the benefits of measuring and reducing their emissions, it will be as if *not doing it* is an archaic business approach.

The author also compiled a resource guide with a list of organizations and other resources for more information, including policy and data-tracking sources; carbon offset developers and validators; carbon calculators, carbon trading and registries; and carbon issue organizations, associations, and nonprofit groups; and an extensive glossary of terms.

At the end of reading the book, I'd be surprised if any company representative didn't see the process of reducing emissions differently, and realize that the game is changing. To adopt Tamminen's lingo, the winners will Crack the Carbon Code, and the losers will lose out on a major opportunity, that just may mean the difference between staying in or going out of business in the 21st century.

Tamminen takes the first step in leading the horses directly to water, but making them drink is another matter altogether. There are still many companies that have a vested interest in continuing to perpetrate the carbon economy.

I think this quote from Tamminen is a great way to end: *"The dying old economy—represented by trade associations rooted in century-old thinking—is doing all it can to protect business-as-usual, an apple cart that is being rapidly tipped over by progressive, profitable businesses that have cracked the Carbon Code."*

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Logan Yonavjak is an Independent Impact Investing Consultant and 2015 MF Candidate at Yale University. She can be reached at Logan.yonavjak@yale.edu.