CEES Newsletter, no. 7, July 2008

University of Colorado Boulder. Center for Energy & Environmental Security
Reproduced with permission of the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment (formerly the Natural Resources Law Center) at the University of Colorado Law School.
Introducing William Boyd: New CU Law Faculty & CEES Board Member

Mike Kopp, CEES Research Associate

William Boyd is excited about his move from Washington, D.C. to Colorado; and he isn’t talking about the difference in relative humidity between our nation’s capital and the breezy slopes of Boulder. Instead, the newest member of the University of Colorado Law School faculty is excited about Colorado’s growing importance as a nexus of innovation and development in the new energy economy. Citing policies like Amendment 37, Xcel Energy’s plans to build the nation’s first fully integrated “Smart Grid City” in Boulder (see Student Comment, Page 4 for more information), research facilities like the National Renewable Energy Lab in Golden, and a growing number of renewable energy companies, Boyd is intrigued by the linkages developing around renewable energy in Colorado. He is also impressed by the many positive things he has heard about CU Law, including its outstanding faculty and students and its strong commitment to environmental and natural resources law.
Spotlight on CEES Partner:

renewable
energy
& energy
efficiency
partnership

Dr. Marianne Osterkorn, International Director of REEEP

The Renewable Energy and Energy Efficiency Partnership (REEEP) is an international partnership that has taken on a market facilitator role over the last four years for the development of renewable energy and energy efficiency technologies and projects. With 80 projects in over 40 countries, REEEP is a respected agent of change for sustainable energy systems. REEEP’s dedication to both energy efficiency and renewable energy makes it unique in the field. It captures the symbiotic and complementary aspects of energy efficiency and renewables in developing integrated and innovative business, policy, regulatory, and finance models for governments, businesses, and other entities. The partnership is recognized by international bodies, including the G8, UN, APEC, APP and IEA, and is increasingly accepted as an implementing entity for renewable energy and energy efficiency projects pursuant to various international programs.

One of REEEP’s U.S.-based projects is also a flagship project of CEES: the International Sustainable Energy Assessment (ISEA). ISEA created an online, searchable and freely accessible database of bilateral and multilateral international energy agreements currently in force. The database is available online at http://cees.colorado.edu/isea/. REEEP has also provided support to the Western Governors Association Clean and Diversified Energy Advisory Committee (CDEAC) to research an array of options for bringing 30,000 Megawatts of clean energy on-line by 2015, increasing energy efficiency 20% by 2020, and providing adequate transmission for the region. In 2007, the CDEAC released several task force reports that examine the feasibility of and options for achieving those goals.

See Spotlight on REEEP, Page 5
Woodworth-Lies (continued...)

Although Cactus has lived most of her working life in Kansas, she had often passed through Boulder as a child when her family vacationed in Colorado, and from a young age Boulder has been her dream home. So it comes as no surprise that she jumped at the opportunity to move her family to Boulder two years ago, particularly as her son loves skateboarding and her husband is an avid snowboarder. Cactus herself just learned to snowboard last year, which, aside from occasional hikes, was her first real experience in the mountains. Boulder still seems like a dream to her. “Boulder is not a real representation of the world,” she says, “it’s so nice, but it seems fake sometimes.” As an example, she recalls the night she drove her husband to a local hospital, where there was live piano music in the main lobby. Still, the lifestyle suits her, and she has ample opportunity to indulge another hobby: xeriscape gardening—an approach to both gardening and landscaping that emphasizes native plants and reduced water usage.

Cactus, now an indispensable part of the CEES team, stumbled into her position as office manager at CEES. She knew she wanted to work in an academic environment and was looking for a position at the University when opportunity knocked. Serendipity or not, CEES is incredibly lucky to have her. In less than a year, she has become the go-to person for administrative and budget matters and is already the person in the office who is most likely to know how to get something done. According to Julie Teel, CEES Senior Research Fellow, “Cactus embodies a rare and valuable combination of efficiency, diligence, warmth, and humor. She is essential to CEES’ functioning and is an absolute pleasure to have around.”

For Cactus, one of the best things about working at CEES has been the opportunity to attend CEES events. She recalls the CEES-sponsored debate on energy and climate policy between candidates for Colorado’s second congressional district as one of the most interesting events she has attended. Working at CEES, Cactus says, has deepened her knowledge of environmental issues. And it has also provided her with a new circle of friends and the academic environment she was looking for.

Around Boulder, you are most likely to meet Cactus on the bike path along Boulder creek, at the weekend farmer’s market, or perhaps at the skate park where she often goes to watch her son. And, if you are lucky enough to run into her, you will almost certainly be the recipient of the warm smile that the staff members at CEES have all come to know and love.

---

**CEES Project Profile: The Presidential Climate Action Project (PCAP)**

*Alaine Ginocchio, CEES Professional Research Assistant & PCAP Project Director*

One of the most important challenges that will face the 44th President of the United States—arguably the most important challenge—will be to quickly and effectively address the interrelated problems of climate change, energy security, and national security. To assist the next President in launching effective Federal leadership on these issues, the Presidential Climate Action Project (PCAP) has engaged science, policy, business, and civic leaders across the nation to produce a Presidential Climate Action Plan (“the PCAP Plan”).

The PCAP Plan includes a broad menu of policy and program recommendations for the President, rather than advocating a particular policy. The Plan is available online at [http://www.climateactionproject.com/plan.php](http://www.climateactionproject.com/plan.php).

PCAP is administered by a team based at the University of Colorado School of Public Affairs in Denver. It is co-chaired by Senator Gary Hart, the Wirth Chair at the CU School of Public Affairs. In addition to the PCAP Plan, PCAP operates a web site that offers resource documents and background information on climate policy to assist the Presidential candidates in forming their climate-action commitments. CEES is one of the organizations that has contributed research to the PCAP Plan and has developed a number of supporting resources.

See PCAP, Page 4
Boulder Gets Smarter: America’s First Fully Integrated Smart Grid City

“We will make electricity so cheap that only the rich will burn candles.”
- Thomas Edison -

Thomas Edison established the first investor-owned electric utility in 1882 with his patented electric distribution system. Ironically, 126 years later, the rich and poor alike are not scrambling to utilize his invention, but are instead scrambling to utilize as little of it as possible—not in use, turn off the juice! As the world freefalls into a carbon-overload catastrophe, what are the public utilities doing to help stop that fall?

Xcel Energy has an answer: Use Boulder, Colorado to experiment with America's first fully integrated Smart Grid City. Generally, a smart grid is defined as an intelligent, auto-balancing, self-monitoring power grid that accepts any source of fuel and transforms it into a consumer's end use with minimal human intervention. The Boulder Smart Grid will be testing technology to make a city's electricity grid "smarter" and more energy efficient by using two-way communication, from the customer to the utility company and vice versa, giving consumers the chance to have a lower carbon footprint, more reliable service with fewer power outages, and increased energy efficiency. This will be achieved through wind power storage, "neural networks," smart substations, smart distribution assets, and smart outage management.

With such an overhaul of a city's energy grid, consumers will most likely have plenty of questions. For example:

Why Boulder? Boulder has the ideal consumer size (50,000 customers/meters), the ideal geographic location (easy access to necessary grid components), the ideal Smart Grid customers (web-savvy, environmentally aware), and collaborative opportunities with the University of Colorado, National Center for Atmospheric Research, National Institute of Standards and Technology, and city leaders. Essentially, Boulder has the flexibility required for this test drive—both in its civic mindset and resources.

See Finch, Page 6

PCAP (continued...)

The goals and objectives of PCAP are as follows:
- Engage the best thinking of U.S. leaders in government, science, and civil society to identify actions that will empower all elements of society to meet the challenges of energy security and climate change;
- Define achievable and effective greenhouse gas reduction goals and timeframes for the United States;
- Create a sound portfolio of options, including policies, programs, statutory and regulatory changes, and budget and staffing options for the 44th President and the 111th Congress;
- Collaborate with current efforts to improve the nation’s energy economy, GHG emissions profile, and national security so that these efforts will result in a more effective whole;
- Set the stage for candidates running for public office in 2008 to take positions on specific proposals to address climate, energy and national security;
- Focus the nation's attention and catalyze concrete action on the most important issues of our time.

In its work for PCAP, CEES has developed a Climate Action Database (CAD), which allows users to access approximately 350 policy proposals directed at the issue of climate change. These proposals, which can be searched by keyword, include federal legislative proposals; national policy initiatives developed by non-profits, business associations, scientists and others; regional initiatives; impact statements; and more. In conjunction with PCAP in Denver, students and staff at CEES developed the framework for CAD by searching and analyzing hundreds of resources for the most relevant and comprehensive climate change policy proposals. These proposals were then summarized for inclusion in the CAD. The CAD is available online at http://cees.colorado.edu/pcap.

CEES also authored a key chapter in PCAP’s original report: Chapter 2 – National Climate Policy. The chapter explains and analyzes the two primary options for pricing carbon emissions: a greenhouse gas (GHG) tax or a cap-and-trade system. By summarizing various existing local, regional, and international pricing schemes, the chapter provides recommendations for the next administration for establishing a national climate policy. The report is available online at http://www.colorado.edu/law/eesi/USCP.htm.

See PCAP, Page 8
Among its many other projects assisting civil society, businesses, and financial institutions in deploying renewable energy and energy efficiency measures globally, REEEP has provided legal assistance to a number of governments and their agencies.

Currently, REEEP is providing legal assistance to Kazakhstan, Mexico, Liberia, and Uganda as part of domestic programs to stimulate renewable energy and energy efficiency. Governments are approaching REEEP as part of a demand-driven grant program whereby REEEP is providing co-financing for policy and regulatory work.

REEEP worked with the Government of Kazakhstan to develop and implement new policies in support of the country’s wind industry. With help from the United Nations Development Program (UNDP), this project has resulted in the introduction of renewable energy-related legislative proposals in the parliament of Kazakhstan.

REEEP also contributed to new “net metering” regulations in Mexico via a project with the Comision Reguladora de Energia (CRE) that analyzed grid codes used by other countries to connect wind and solar farms to the grid. Net metering allows for grid-connected solar PV panels to put power into the grid and thus the electric meter can “spin in both directions,” allowing customer-generators to receive credit for energy they generate. In June 2007, CRE published The Small Scale Solar Energy Interconnection Contract. This contract will allow small trade and residential services to generate their own electricity, and thus removes a major barrier to the uptake of solar power in the country.

In Liberia, REEEP supported a non-governmental organization (NGO) that was working with the post-war government to ensure that renewable energy was included in the new National Energy Law. Prior to REEEP’s involvement, the country was planning to rebuild its energy infrastructure following a fossil-fuel path. The new law includes support for renewable energy as part of the country’s portfolio strategy for energy production. Ensuring that renewables are part of the energy mix is a key focus of REEEP.

REEEP’s ongoing work in Uganda is focused on establishing policies and regulations in support of solar water heating. The majority of the population in the capital city of Kampala is using electric water heaters to heat water. The energy demand in the mornings and evenings is stressing the national electricity network. One of REEEP’s projects in the country strives to establish incentives for switching domestic water heating from electricity to solar. If successful, the new regulations will save the city 1MW of electricity during peak hours. REEEP envisions that this project will be replicated in other parts of Africa and in other developing countries.

In order to facilitate the role of renewables in international law and international trade discussions, REEEP is providing funding to the Renewable Energy and International Law (REIL) project based in Washington, D.C. In addition, REEEP is working with CEES to identify possible synergies with U.S. foreign policies and programs that seek to increase renewable energy and energy efficiency projects in developing countries. For example, Title IX of the 2007 Energy Independence and Security Act establishes new “International Energy Programs” to promote the deployment of clean and efficient energy technologies in developing countries and encourages the formation of collaborative partnerships, which is one of REEEP’s strengths.

To learn more about REEEP and stay informed about the progress of REEEP’s international projects, please visit http://www.reeep.org.
Message From Carlisle (continued...)

It took two legislative sessions for us to overcome CU’s initial opposition and resolve conflicts, but last year, with HB-1203, the legislature funded the Colorado Energy Profile, a state energy audit for EESI to perform. In January of this year, EESI became the full-fledged Center for Energy and Environmental Security (CEES). From its birth pangs six years ago to the record overflow crowds that pack its events today, CEES has been an inspiration—a bubbling, cross-disciplinary laboratory of ideas sustained by Professor Guruswamy’s vision.

Malcolm Gladwell has written about the paradox of "multiples”—the phenomenon of simultaneous scientific discovery in multiple, unrelated quarters—such as Darwin’s and Wallace’s discovery of natural selection, Bell’s and Gray’s simultaneous invention of the telephone, Rosland Franklin’s then Watson’s and Crick’s unraveling of the double helix of DNA at the same time. Since vision fills a vacuum, the paradox of multiples makes perfect sense. It’s going on all around us in Colorado. As federal leaders aggregate responsibility, CEES, the Collaboratory, the Rocky Mountain Climate Organization, and the Ritter administration too are filling the vacuum in ever more exciting ways. The Western Governors’ Association, led by Governor Ritter, is developing a model energy plan for the next administration. Colorado, Governor Ritter says, can be the showcase for what a national energy policy should look like, with its traditional and renewable resources, and its world-class research and development resources.

I like to think Governor Ritter’s mature leadership grew naturally from the extraordinary policy event sponsored last summer by CEES, called Envisioning Energy, where I was briefly honored to speak. A year ago, Envisioning Energy brought to the CU Law School members of the new governor’s cabinet, legislators, Congressman Udall, the British consul, and the CEES research and policy crew. Vision was explicitly the order of the evening, and the vacuum has been filling ever since.

Finch (continued...)

What are the drawbacks? Roy Palmer, Managing Director of Government and Regulatory Affairs for Xcel Energy, points out that the biggest hurdle to implementing this system is the inevitable and immense up-front costs. Boulder is lucky enough to have large companies investing in the project under the banner of research and development so that the project can be adequately funded. Xcel hopes to be able to use Boulder to learn what works best so that up front costs are not so high for other cities.

The public utilities companies may also be able to use decoupling to keep implementation costs from raising rates to users. Decoupling is the disassociation of a utility’s profits from its sales of the energy commodity. The utility’s returns are instead aligned with certain revenue targets, and rates are adjusted up or down to meet the target at the end of the adjustment period. Thus, the utility can be indifferent to a grid that is more energy efficient, even when the smart grid results in the company “selling” less of its product.

What will it take for this system to be implemented worldwide? Many areas are already beginning to implement smart grids, and the European Union is an active participant in research surrounding smart grid technologies. Currently, there are not enough companies willing to invest in smart grids to make the necessary technologies economically feasible for developing countries. Palmer points out that the more promising aspect for energy efficiency in developing nations is the market for renewable energy technologies, such as wind and solar, that should increase the technologies’ functionality and decrease the price so that developing countries may feasibly implement those technologies in the near future.

What is the timeline for implementation of the Boulder Smart Grid, and how will the results be utilized? Xcel plans to complete the grid (the “build out” phase) between April 2008 and March 2009 and to complete a cost-benefit assessment by the company’s fourth quarter in 2009. Xcel intends to fully share its results with other utility companies and to publicize the technological successes and failures, the benefits from implementing the system, the resulting energy savings, and the extent to which renewable energy sources were successfully added to the grid. Xcel will then take its results and utilize them in other cities.

Will it work? Will current infrastructures make room for smart grids to be implemented? Will consumers in cities not as “green” as Boulder welcome such an overhaul of city grids? These answers I cannot begin to address as of yet. However, it is exhilarating that the people in this region get to participate in a system that utilizes cutting edge technology for the future of energy efficiency. That is something Edison would have been proud of, and it is something we should be proud of.

For a list of sources used to write this article, please visit: http://www.colorado.edu/law/eesi/News/007/Sources.html
Boyd (continued...)

Originally hailing from South Carolina, Boyd attended the University of North Carolina at Chapel Hill, where he helped found the Student Environmental Action Coalition. After graduation, Boyd worked at the World Resources Institute in Washington, D.C. until he left to pursue a Ph.D. from the University of California at Berkeley's innovative Energy Resource Group, an interdisciplinary program that examines energy issues from many perspectives. Following this, he received his J.D. from Stanford University and clerked at the U.S. Court of Appeals for the Fourth Circuit. Boyd then returned to Washington, D.C. where he advised the Democratic minority of the Senate Committee on Environment and Public Works on science issues and practiced at Covington & Burling, LLP, where he focused on energy law, toxic contamination, and environmental issues.

Boyd is excited about the opportunities he sees at CU Law. In line with CEES' goals, he would like to build a course on energy law and regulation. He also plans to teach courses on toxic chemicals and global warming. Foremost among his numerous research plans is a topic he has been working on since his time with the Senate and with Covington & Burling, LLP: devising a way to incorporate emissions from tropical deforestation into the international climate regime. Although deforestation accounts for a full 20% of world greenhouse gas emissions, these emissions were completely excluded from the Kyoto Protocol, a mistake that must be avoided in the future. Boyd also plans to devote his attention to biofuels, analyzing the food versus fuel debate and developing an accurate methodology for measuring the GHG impact of biofuels.

In addition to joining the faculty at CU Law, Boyd is also the newest member of the CEES Board of Directors. Of CEES' many projects, Boyd is particularly interested in the Energy Justice Project, which aims to promote the use of intermediate, sustainable energy technologies in developing countries. This project, Boyd said, has the potential to have a large, positive impact on the environment and the world. Boyd also has ideas for a number of projects that CEES could pursue in the future, but added that CEES is already working on a number of important projects to which he would be happy to contribute.

When asked about the current political situation surrounding climate change in Washington, D.C., Boyd was hopeful but realistic. The recent failure of climate change legislation to garner the 60 votes needed in the Senate to end debate was a real disappointment. Boyd also expressed skepticism that the upcoming elections will shuffle the ranks of senators enough to provide the votes needed to pass such a bill in the near future, particularly with high energy prices pressuring Congress to avoid taking any actions that might raise prices further. However, he was more optimistic about the executive branch, calling both major presidential candidates a big improvement for climate change over the current administration. He is hopeful that the next president will make climate change a top priority by sending a serious piece of legislation to Congress early in his first term. He added that CEES' Presidential Climate Action Project (for more information see Project Profile, Page 3) could be a very important tool for the next president's transition team.

Boyd cautioned that change will not be easy, nor will it happen overnight. Energy infrastructure can last for thirty or forty years. If the world does not begin investing in new forms of energy and finding ways to sequester carbon from coal plants now, particularly in large developing countries like China and India, we could be stuck with polluting sources of energy for a long time to come. However, Boyd was hopeful that we will be able to address our energy problems and successfully transition to a low-carbon energy system.
Finally, one of the most challenging and interesting components of CEES' work for PCAP has been extensive research regarding the boundaries of executive authority at the federal level. CEES was commissioned by PCAP to analyze the use of presidential directive authority within the context of climate change policy, with a specific focus on executive orders. The results of this research are published in two reports: Boundaries of Executive Authority: Using Executive Orders to Implement Climate Change; and Boundaries of Executive Authority: An Evaluation of Priority Proposals from the Presidential Climate Action Project. The first report is available online at http://www.colorado.edu/law/eesi/Boundaries Executive Authority.pdf. The second report has not yet been released.

The first report summarizes relevant guidelines on the legal boundaries of executive authority, with a focus on the use of executive orders to implement appropriate provisions of the PCAP Plan. The report does not focus on what has been done in the past by presidential directive or what might be "possible" to implement by executive order. Instead, the report focuses on those actions that can be taken using executive authority, primarily executive orders, with credibility, integrity, and within the legal parameters of our constitutional form of government.

Using this first report as a guide, PCAP selected specific proposals from the PCAP Plan as priorities and a sampling of the options the next President has to address climate change. In the second report, CEES evaluates the implementation of each of these priority proposals by executive order or other executive directive. Students and staff at CEES identified the relevant legal authorities applicable to each specific proposal, analyzed these authorities, and then evaluated each proposal in terms of implementation by executive directive. In addition to CEES professional staff, over a dozen law students participated in this part of the project, conducting and assisting in the development of the research and, in a number of cases, co-authoring entire chapters of the report. The research has spanned the areas of constitutional and administrative law, as well as environmental and energy-related statutes, with a focus on one of the most timely issues in legal circles today: the legal boundaries of presidential authority. By all accounts the students found the work both fascinating and rewarding.

Colorado Energy Profile: Update At A Glance

This snapshot of the Colorado Green wind farm taken from CEES' 3D Google Earth Colorado Wind Installations Explorer (coming soon) shows all of the farm's 108 wind turbines. Each turbine generates 1.5 MW, for a grand total of 162 MW produced on site. GE Wind Energy built the Colorado Green wind farm twenty miles south of the town of Lamar in 2003. At the commencement of construction, it was the largest wind power project in the state of Colorado and the fifth largest wind farm in the world, but has since been surpassed by other installations. The 3D Google Earth Colorado Wind Installations Explorer is just one feature of CEES' Colorado Energy Profile project, funded by the Governor's Energy Office, which will be unveiled in October 2009. Stay tuned for future updates.

Other CEES News

~ CEES Director Gives Plenary Address at 2008 World Renewable Energy Congress in Glasgow, Scotland. For more information: http://www.wrennk.co.uk/wrecx.html

~ CEES receives new grant to develop model Executive Orders on climate change. For more information: http://www.climateactionproject.com

Questions? Comments? Please Contact:

Mariah Zebrowski, Editor-in-Chief
Mariah.Zebrowski@Colorado.edu

James Lamb, Assistant Editor
James.S.Lamb@Colorado.edu

JULY 2008: ISSUE SEVEN: PAGE 8