CCPI Second “Annual” Report
July 2011 – December 2012
The Center for Carbon-free Power Integration (CCPI) at the University of Delaware (UD),
www.carbonfree.udel.edu, conducts research and publishes widely in peer review publications
and law journals on offshore and coastal wind power, transmission planning, and storage to
support large-scale carbon-free power systems. The UD/CCPI is the leading teaching and
research institution in the United States on offshore wind power
(www.ceoe.udel.edu/windpower) and on vehicle-to-grid/grid-integrated vehicle (V2G/GIV)
electric storage (www.udel.edu/v2g).

In brief, CCPI’s mission is to undertake scientific research, educate the next generation of
students, and actively engage industry, policy makers and the public, and facilitate use of power
from carbon-free geophysical flows. These power sources include surface wind, geostrophic
winds, and ocean currents. The primary areas of inquiry are offshore wind power, and V2G/GIV
technology as a means of electricity storage.

CCPI, founded in 2008, is a research center within the College of
Earth, Ocean and Environment (CEOE) and is part of the UD’s
broader efforts on energy through the University of Delaware
Energy Institute (UDEI). CCPI has researchers with appointments
in four UD colleges—Earth, Ocean and Environment; Engineering;
Business and Economics; and Agriculture and Natural Resources. In 2011-2012, Ms. Bonnie
Ram became Associate Director of CCPI, and Dr. Cristina Archer joined eight-person CCPI
governing body. Dr. Suresh Advani stepped down from the governing body and we thank him
for his service. An additional eight faculty members who conduct research or undertake
teaching and who collaborate with CCPI on various initiatives have chosen to affiliate with CCPI
(‘Participating Scientists’). A short description of CCPI members follows.

Leadership

Director – Dr. Jeremy Firestone is a Professor in SMSP, is on the Legal Studies Executive
Committee, and is Director of CCPI. He is an expert on permitting of offshore wind and
transmission, marine spatial planning, environmental constraints on offshore development, and
social acceptance of offshore wind power.

Research Director – Dr. Willett Kempton is a Professor of Marine Policy with a secondary
appointment in Electrical and Computer Engineering. Dr. Kempton research interests include
integrated system design, resource assessment, grid integration and social acceptance of wind
energy. He also leads CCPI’s vehicle to grid power/grid-integrated vehicle (V2G/GIV) efforts.
**Associate Director – Ms. Bonnie Ram** is a Senior Research Scientist with CCPI whose research interests include integrated risk assessment and community acceptance of wind energy. She brings 30 years of experience in planning and directing multidisciplinary energy projects relating to environmental and social science analyses. Between 2001-2010, she was a senior consultant supporting the DOE and NREL with the creation of the offshore wind strategy.

**Other Governing Scientists**

**Dr. Christina L. Archer** is an associate professor in the College of Earth, Ocean, and Environment, where she has a joined appointment between the Physical Ocean Science and Engineering program and the Department of Geography. Her research interests include wind power, meteorology, air quality, climate change, and numerical modeling.

**Dr. Meryl Gardner** is an Associate Professor of Marketing at the Lerner College of Business and Economics, University of Delaware. She views marketing opportunities through a consumer psychology lens, with a focus on the influence of effect on consumer behavior and the role of marketing in socially positive behavior change.

**Dr. John Madsen** is an Associate Professor in the Department of Geological Sciences. His research is focused on several areas, including the role geotechnical properties of sediments play in the siting of offshore wind projects and earth science education in elementary and middle schools using pedagogical context knowledge as a framework.

**Dr. Ajay Prasad** is Professor of Mechanical Engineering at the University of Delaware and also serves as Director of the Center for Fuel Cell Research, and directs the University of Delaware Fuel Cell Bus Program. Professor Prasad’s other research interests include wind and ocean current energy, and vehicle to grid technology.

**Dr. Dana Veron** is an Assistant Professor in the Physical Ocean Science and Engineering. Dr. Veron’s recent research interests include offshore wind resource assessment, sea breeze circulation, land-ocean-atmospheric interactions, and regional climate change.
Other Participating Scientists

**Dr. Suresh G. Advani** is the George W. Laird Professor of Mechanical Engineering and Associate Director of the Center for Composite Materials. His research focus is on transport phenomena as applied to Composite Manufacturing and Fuel Cells.

**Dr. Jeffrey Buler** is an Assistant Professor of Wildlife Ecology. His research is focused on avian movement, behavior and ecology during migratory stopover and modeling wildlife species distributions. Since 2011 he has led a post-construction avian and bat assessment at the UD Lewes Wind Turbine.

**Dr. James J. Corbett** is a Professor of Marine Policy with a secondary appointment in Civil and Environmental Engineering. Dr. Corbett is a marine transportation expert, and brings that expertise to bear on where commercial navigation intersects with offshore wind power.

**Dr. Stephen Dexter** is a Professor of Applied Science and Marine Biology. Dr. Dexter conducts research in a variety of areas, including durability of materials for, and marine corrosion and bio-corrosion of, wind power systems.

**Dr. Fouad Kiamilev** is a Professor in the Department Electrical and Computer Engineering. In area of energy, his research involves design of embedded systems for electric vehicles and V2G technology as well as power conversion circuits.

**Dr. Fabrice Veron** is a Professor of the Physical Ocean Science and Engineering Group with a secondary appointment in Civil and Environmental Engineering. Dr. Veron's research focuses on air-sea interaction and the small scale fluid dynamics at the surface of the ocean.

**Dr. George R. Parsons** is a Professor of Marine Policy, with a secondary appointment in the Department of Economics. Dr. Parsons' research is centered on understanding consumers' preferences for environmental goods, including electric vehicles and offshore wind turbines.

**Dr. W. Gregory (Greg) Shriver** is an Assistant Professor of Wildlife Ecology, where he is engaged in projects related to restoration, avian ecology, monitoring, and conservation. Dr. Shriver also participates in the post-construction avian and bat assessment at the UD Lewes Wind Turbine.
Major Developments/Highlights

1. The UD Wind Turbine

The University of Delaware’s wind turbine, owned and operated by First State Marine Wind (FSMW), a partnership between UD’s Blue Hen Wind, Inc., and Gamesa Technology Corporation, www.ceoe.udel.edu/windpower, and which is located in Lewes, has been generating electricity for approximately 2.5 years through December 2012, having generating over 11 million kWh of renewable, clean electricity. The wind turbine is testing a turbine generator designed specifically for North America and Central America (60hz only). The turbine generator, designed by University of Delaware’s partner, Gamesa Technology Corp, will be tested over an approximate twelve-month timeframe. Testing is intended to lay the groundwork for a chain of production that will reside in the United States and will be lighter and cheaper to manufacture than existing generator technology. In addition, other research, including a study of corrosion due to the marine environment, which being undertaken as part of the UD-led, Department of Energy (DOE) sponsored, Atlantic Wind Consortium; an examination of local public attitudes regarding the wind turbine funded by Delaware/NOAA Sea Grant; and studies sponsored by FSMW to examine potential risks to bird and bat populations, mechanical forces on the nacelle and vibration of the tower under strong winds, and a new health monitoring systems for the turbine blades continues to flourish at the wind turbine.

2. DOE Offshore Wind Energy Grants Awarded

In September 2011, DOE made 41 awards to help speed offshore wind energy development. CCPI faculty received two of these awards as Principal Investigator and a substantial subcontract under a third. For the first project, CCPI is bringing together foundation designers, a turbine OEM and vessel operators to come up with an integrated offshore wind turbine design to lower costs. Willett Kempton is the PI, with John Madsen and Jeremy Firestone, also working on this grant. Andrew Levitt, a CCPI graduate student, led the proposal development process and also has a large role in moving the now funded project forward. A second award examines the pros and cons of offshore transmission and the potential effects of large offshore wind penetration on grid operations. Partners include Princeton, PJM and the Atlantic Wind Connection. Willett Kempton is PI, with Cristina Archer and Jeremy Firestone, Co-PIs. Finally, UD’s Dana Veron and Cristina Archer are subs to an award by SUNY Stony Brook in a project to improve atmospheric models for offshore wind power mapping. Further details on these projects can be found at http://www.ceoe.udel.edu/windpower/fundedresearch.html.
3. **Research for the Federal Government on offshore wind power and beach tourism**

In September 2012, Professors Parsons and Professor Firestone entered into a $200,000 cooperative agreement with the Department of the Interior’s Bureau of Ocean Energy Management (BOEM) to undertake research on the effect of offshore wind development on beach tourism. The study area includes beaches from South Carolina to Cape Cod, Massachusetts, with the study population including the coastal and nearby states likely to visit beaches in this part of the United States. This research will identify the preferences of tourists, measure the effect of offshore wind development on beach use (positive and negative), tourist services (such as boat trips to view the wind turbines up close), and characterize the response of tourists to offshore wind development. This research will conclude with an estimation of the economic effects of offshore wind power on beach tourism. This research is further enhanced by a related existing grant secured by Professor Parsons from Delaware/NOAA Sea Grant.

4. **Joint Marine Spatial Planning and Model State Offshore Wind Power Policy Workshop**

On November 14, 2011, CCPI a workshop was held as part of two funded research projects: a NOAA/DE Sea Grant funded project on marine spatial planning (MSP) and a Department of Energy funded project on model state policies to advance and oversee the development of offshore wind power was held in Wilmington, Delaware. The workshop brought together stakeholders and community members to discuss the evolving MSP and state policy frameworks, including their strengths and shortcomings; current developments on the federal and state levels; and to receive feedback on the Delaware MSP mapping effort and the development of model documents to advance the purchase and sale of offshore wind energy. CCPI members who made presentations at the workshop included Professor Jeremy Firestone and Professor Greg Shriver as well as graduate research assistants, Alison Bates, Katya Samoteskul, Dawn Kurtz Crompton, Blaise Sheridan and Andrew Levitt. Alumnus Dr. Amardeep Dhanju, now with the US Bureau of Ocean Energy Management (BOEM) made a presentation on federal policies; Dr. Annette Grilli of the University of Rhode Island and Ms. Sara Cooksey of the Delaware Department of Natural Resources and Environmental Control and of the Mid-Atlantic Council on the Oceans (MARCO) also made presentations. Ms. Bonnie Ram, now the Associate Director of CCPI, facilitated the meeting. Among the attendees were citizens and representatives of Atlantic Wind Connection, BOEM, DNREC, Delaware Economic Development Office, Delaware Finfish Advisory Council, Delaware Sea Grant, Delaware State historic Preservation Office, Delaware Nature Society, Delawind LLC, Delmarva Ornithological Society, Dewey Beach Mayor’s Office, US FWS, EPA, Lenape Tribe of Delaware, Narragansett Indian Tribe, National Audubon Society, Natural
5. Atlantic Wind Consortium
To make US university research more relevant to the wind industry, and to advance wind companies in this fast-developing technology field—DOE funded initiatives that would work to engage these two sectors, including one led by UD: Advanced Offshore Wind -- Atlantic Consortium. The Consortium is comprised of university partners, UD, University of Maryland, and Old Dominion University partners, which is advised by an Industrial Board. The focus of the Consortium is on research and curriculum development. The two events in 2012 are of particular note. First, in October 2012, the Atlantic Wind Consortium organized the Webcast “Drivetrain and Tower Loads: Measurement Challenges for Design and Costs.” The underlying concept for this webcast was to discuss new offshore wind research within the context of the needs of industry to improve performance and lower the cost of energy. Professor David Burris led the discussions with participants from the Industrial Advisory Board, engineers from Gamesa and NREL’s Gearbox Reliability Collaborative, and CCPI research assistant (and Physical Ocean Science and Engineering graduate student) DeAnna Sewell. The following month the Consortium organized and led a workshop entitled, “Meteorological (MET) Research for Wind Power in the Mid-Atlantic: Measurement Paths Forward.” As significant meteorological research, measurement and modeling are being carried out in the Mid-Atlantic region, the objective of the workshop was to inform the wind industry and other stakeholders—there were 15 professionals in attendance—about various projects and how they might interact in the future to combine skill sets and resources.

6. V2G Research
Professor Kempton and the CCPI have led a team in developing a Vehicle-to-Grid system that resulted in 3 patents: one for a control system in the electric vehicle (the Vehicle Smart Link or “VSL”), one for a control system on the charging station and one for server software that coordinates among the fleet of vehicles and the grid. In addition, the patent for the EVSE charger was licensed to Milbank Manufacturing, a major manufacturer of electrical equipment in the United States. In July, 2011, the patent for the aggregator was licensed to NRG, in exchange for a commitment of several million dollars to scale up the technology, and a joint partnership between NRG and the University of Delaware was created called eV2G.
7. **V2G Collaboration with Denmark Technical University**
From July 2011 to January 2012, Professor Kempton took a six-month sabbatical from the CCPI to be the Otto Mønsted Guest Professor at the Center of Electric Power and Engineering in the Department of Electrical Engineering, Technical University of Denmark (DTU).

8. **Series of Conference Presentations in France**
From November 21 to November 29 of 2012, Professor Kempton was invited by the Economics and Management of Networks Industries (ENIM) to give a series of conference presentations in France. Professor Kempton gave the following presentations; “Engineering, Infrastructure, and Supply for an Electric Fleet”, “Economics of Power Markets for Electric Vehicles to Grid”, and “Consumer Issues in Electric Vehicles and Electric Vehicles” to professional of energy markets, and academics and students of Economics and Engineering.

9. **CCPI Brown Bag Lunches**
In 2012, CCPI initiated a series of brown bag lunch seminars to bridge CCPI’s large community, to inform each other of significant wind energy or V2G research being undertaken at UD, to enhance the education and research mission of CCPI, and to enhance scholarship through oral presentation of research results to one’s peers.

On March 14, 2013, Marine Policy graduate students Alison Bates and Kateryna Samoteskul led the inaugural brown bag seminar, presenting their findings on placing wind power off the Delaware coast in a marine spatial planning context. One of the many maps created is reproduced below.

Later that spring, Chris Hughes, a graduate student in the Physical Ocean Science and Engineering program talked about his research characterizing the Delaware Sea Breeze using observations and modeling. Finally, during fall term 2012, Professor Kent Messer and his graduate student, Jacob Fooks, of the Department of Applied Economics and Statistics, gave a presentation on how offshore wind production might affect Delaware beach visitation. This November brown bag was the first by CCPI reaching out beyond Center itself as neither presenter is affiliated with the Center.
Publications

Peer review Articles and Book Chapters
Being an interdisciplinary center, CCPI has a research agenda covering a plethora of sub-topics including, wind resources, wind integration, marine spatial planning, social impacts and perceptions, environmental risks, uncertainties, and benefits, and policy, economics and law in its wind research arm, and EV and GIV technology, EV use, policy and markets, GIVs for grid integration, and GIVs and power markets in the v2G sector. See http://www.ceoe.udel.edu/windpower/publications.html and http://www.udel.edu/V2G/ArticlesandPapers.html. It was a productive period, with 11 peer review articles and 2 book chapters published along with one thesis and one report. They are:


Research Reports

Theses and Dissertations

Christopher P. Hughes, 2011, The Climatology of the Delaware Bay/Sea Breeze. Thesis, Master of Science in Marine Studies, University of Delaware, Newark, Delaware, USA

Student Research
One of the most important missions of CCPI faculty is the mentoring of undergraduate and graduate students who work closely with faculty on research grants and on their own research. At the close of 2012, twelve master’s students and five PhD students were pursing graduate degrees, working on CCPI research and pursuing theses or dissertations in energy (or related climate and ocean acidification spheres). With two graduate students completing master’s degrees during 2012 and the second half of 2011, the total as of the beginning of 2013, stands at eight. That there are seventeen students presently working with CCPI faculty on CCPI-related research highlights the growth of the program since its inception in fall 2003 and the formation of CCPI in 2008. Student research is quite broad and includes wind resource assessment and turbine wakes, environmental impacts of renewable and non-renewable electricity generation, economics, social and policy dimensions of wind energy, marine spatial planning, turbine tower dynamics and subsea loading, designing infrastructure and policy instruments to advance electric vehicles and V2G.

Alison Bates, PhD, Marine Policy
Alison has a B.S. in Biology from William Smith College and she previously served as the Deputy Director for the San Bernardino National Forest Association. Her primary research interests are balancing multiple uses and marine mammal conservation. Alison’s poster at the European Offshore Wind Association Offshore Wind Power Conference (November 2011) won Honorable Mention and she received the Excellence in Student Research Award from Delaware Sea Grant.
Jean Brodeur, Master’s Marine Policy
Jean earned a B.A. in International Relations from the University of Southern California (USC). Before coming to UD in 2012, Jean worked as Public Policy Coordinator for Interaction and as the Federal Relations Associate for USC. Jean works on the V2G project. Her own research interest tends more toward federal science policy and ocean acidification.

Joseph Brodie, Master’s, Physical Ocean Science and Engineering
Joe has a B.S. in Meteorology from Rutgers, the State University of New Jersey. Joe’s research is focused on using numerical models to simulate wake effects in offshore wind farms with the goal of mitigating power losses. Additionally, he is interested in helping to develop a further understanding of the interaction between wind farms and the atmospheric boundary layer.

Brandon Budenz, Master’s, Marine Policy
Brandon holds a B.A. from the University of Minnesota in chemistry and an M.S. from the University of Delaware in inorganic chemistry. Brandon’s area of interest is electric automobiles and the power grid. He is interested in grid storage through chemical potential, with his research being an application. Brandon matriculated in 2012 and is a research assistant on the eV2g project.

Dawn Kurtz Compton, Master’s, Marine Policy
Dawn has a B.S. in Communications from Boston University and J.D. in Environmental Law from the Widener University School of Law. Dawn’s areas of interest include state and federal renewable energy regulation. Dawn was a Magers Family fellow in Fall 2011. Dawn is now an Attorney in Proctor Heyman, LLP, where in between cases she is working on her master’s analytic paper on offshore wind power, the dormant Commerce Clause, and the GATT.

Kyle Horton, Master’s Entomology and Wildlife Ecology
Kyle matriculated in Spring 2012 after receiving a B.S. in Biology from Canisius College. Kyle works with Professors Buler and Shriver and a Delaware State University colleague on the Lewes Wind turbine avian and bat assessment. He researches passerine migration using multiple methods to quantify density and composition and employs NEXRAD weather radar, mobile radar, flight calls, and thermal imaging to quantify nocturnal migration.

Christopher Hughes, PhD, Geography
Chris is following up his Masters of Science in Marine Studies from the POSE program with the pursuit of a PhD in Geography. He is working on fine-scale observations and modeling of the sea breeze along the Delaware coast and the effect of coastal urbanization on the local breeze. In particular, Chris is trying to understand why in circumstances that seem similar the sea breeze can be very strong one day, and weak the next.
Andrew Levitt, Master’s, Marine Policy
Andrew has a B.S. in Physics from the University of Toronto. After working as a project manager in the power industry, Andrew joined the Marine Policy program. Andrew published a peer review paper on costs of offshore wind energy, part of the UD-NREL Cooperative Research and Development Agreement (CRADA). Mr. Levitt has been providing project management for eV2g and for the DOE-funded Wilmington Canyon integrated system design study.

Lance Noel, PhD, Marine Policy
Lance has a B.A. in Legal Studies from the University of California, Santa Cruz. He is researching the impact of conventional electricity production on water resources, and public trust doctrine implications. In addition, he is examining the value of frequency regulation services provided by vehicle to grid capable cards.

Katheryna (Katya) Samoteskul, Master’s, Marine Policy
Katya has a B.A. in Government and Environmental Studies from St. Lawrence University. Her Master’s thesis will evaluate the costs and benefits of shifting the commercial ships farther out to sea in the mid-Atlantic to facilitate development of offshore wind closer to shore. Katya was a Magers Family Fellow during summer and fall 2012. In December 2012, Katya was awarded a Knauss Marine Policy Fellowship, where she will work in NOAA’s Climate Program Office.

Regina McCormack, Master’s, Marine Policy
Regina has a B.S. in Environmental Science from the University of Notre Dame. In her master’s research, Regina is monetizing the external costs of conventional electricity on water resources, focusing especially on the value of water used and consumed and the fish that are impinged and entrained by thermal power plants.

Nathaniel Pearre, PhD, Marine Policy
Nathaniel has a B.S. in Mechanical Engineering from Swarthmore College. Nat worked for several years as a composite fabricator and engineer, and later received an M.S. in Coastal Engineering from UD. His current research is an investigation of vehicle driving patterns in America, and what they mean for the time-dependent grid load, or the time-dependent grid storage resource that private vehicles could represent.

Deanna Sewell, Master’s, Physical Ocean Science and Engineering
Deanna has a B.S. in Ocean Engineering from Florida Atlantic University. Deanna’s current research is in turbine tower dynamics from both experimental and modeling aspects, as well as quantifying the ocean current and wave forces exerted on offshore sub structures via computational fluid dynamics. Deanna received funding for this work from FSMW. Deanna received certification to climb the UD wind turbine and deploy research devices.
Blaise Sheridan, Masters Marine Policy
Blaise came to UD with a B.S. in Science, Engineering and Environmental Studies from Swarthmore College. While at UD, Blaise earned his certification to climb the UD wind turbine and deploy research devices and was a Magers Family Fellow during spring 2012. He currently works at Environmental and Energy Study Institute in Washington, D.C. and is finishing up his master’s thesis on social costs of alternative means of electricity generation.

Nicole (Niki) Suto, Master’s, Marine Policy
Niki earned a B.S. in Energy & Environmental Policy – Science & Technology from the University of Delaware in 2011. She wears many hats, including being a founder and chair of the Newark Bike Project and an energy auditor in addition to her work as a research assistant on the eV2g project. Niki is undertaking research on optimal location of electric vehicle charging stations.

Heather Thomson, PhD, Marine Policy
Heather came to UD in 2010 to pursue her Marine Policy degree with a multidisciplinary background, with an M.S. in Oceanography and an MA in Public Service and Administration from Texas A&M University and a B.S. in Chemistry from Lehigh University. Heather is studying the economics and environmental impacts and amenity/disamenity values of wind turbines and fossil fuel plants.

Bruce Williams, Masters, Marine Policy
Bruce has a B.S. in Mechanical Engineering, minors in Civil and Ocean Engineering from California State University at Long Beach. Bruce has 18 years professional experience as an Ocean Engineer and Coastal Planner/Engineer, including 15 years with the U.S. Army Corps of Engineers, Los Angeles District. Bruce is undertaking research on LiDAR applications for offshore wind power.

Past Graduates
Scott Baker, Master’s
Scott defended his thesis in July 2011, and his study focused on estimating the realistic offshore wind power potential in the Atlantic Ocean area adjacent to the Transmission System Operator (TSO) PJM Interconnection. Since January 2011, Scott has been working for PJM Interconnection as a business solutions analyst in the Applied Solutions Department.

Amandeep Dhanju, PhD
In 2010, Amardeep was awarded a John A. Knauss Marine Policy Fellowship to work at the Bureau of Ocean Energy Management (BOEM) as the coastal marine spatial plan strategic coordinator. Dr. Dhanju has since joined the Environmental Studies Program (ESP) at BOEM as an ocean policy analyst where, among other tasks, he works on National Ocean Policy initiative.
Jesse Fernandes, BS, Environmental Science
Jesse worked with CCPI as an undergraduate researcher before pursuing a master’s degree at the University of Michigan in Land Use Planning. Jesse then won a Presidential Management Fellowship, where she worked with DOE, FERC and the Army Corps of Engineers. She is currently a regulatory specialist with FERC in Seattle.

Christina Christensen (formerly Jarvis), Masters
Christina works for the US EPA in its Standards and Health Protection Division, Office of Science and Technology. Christina’s work at EPA revolves around helping states and tribes meet the water quality standards requirements of the Clean Water Act. More specifically, she works on national policy issues related to designating uses that protect the fishable/swimmable goals of the Clean Water Act.

Andrew Krueger, PhD
Andy is on leave from BOEM’s Alternative Energy Leasing Program, where he most recently served as the Cape Wind project manager, pursuing to his dream as a police officer and serving proudly in Albany, Georgia (update: in 2013, Andy returned to BOEM and to Cape Wind).

Jonathan Lilley, PhD
Jonathan, who graduated with a Ph.D. in Marine Studies, is a Postdoctoral Research Fellow at the School of Ocean and Earth Science and Technology at the University of Hawai‘i, investigating public attitudes toward the development and implementation of using deep, cold ocean water for air conditioning as an alternative to fossil fuels.

Meredith Blaydes Lilley, PhD
Meredith is a Postdoctoral Research Fellow at the University of Hawai‘i, examining Pacific region climate change impacts and adaptation responses. Her work centers around three projects: coordinating, and serving as co-author with, an inter-agency, eight-member team on the Pacific Climate Change Resource Guide; reviewing and developing a climate impacts report (The Effects of Climate Change on Hawai‘i’s Ocean and Coastal Resources); and updating the NOAA-based, PacificIslandsClimate.org database with climate adaptation case studies.

Jacqueline Piero, Master’s
Jacqueline studied the motivations for and effects of citizen participation on the state of Delaware’s 2008 energy policy decision that resulted in the first offshore wind power purchase agreement in the United States. While serving as a CCPI research assistant, she also worked on policy aspects of V2G. She now consults for companies in the electric vehicle industry.