



Fall 2013

## Environmental and Energy Law Perspectives: Fall 2013

Environmental and Energy Law Program

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PERSPECTIVES

# Next Steps For Electric Storage Systems



This 1 MW/1 MWh A123 lithium ion battery system at the Maui Electric Wailea Substation, Hawaii, began operating in May 2013. AES Westover and AES Laurel Mountain also use A123 systems. (Photo courtesy of A123 Energy Solutions)

By Donna M. Attanasio<sup>1</sup>

Electric energy storage is being widely recognized as a necessary and important component of the next-generation electric grid. Its facility as a source of generation and transmission support plus its value as a complement to variable renewable energy resources and microgrids make it an integral part of the future of the fast growing clean-tech sector. Recent advances in regulatory treatment and market structure, discussed below, are important to its growth, but additional challenges remain.

## What is it and why now?

Energy storage is defined by the U.S. Federal Energy Regulatory Commission (Commission) as: “property that is interconnected to the electrical grid and is designed to receive electrical energy, to store such electrical energy as another energy form, and to convert such energy back to electricity and deliver such electricity for sale, or to use such energy to provide reliability or economic

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## WHAT'S NEW

# Student Research Helps Drive Virginia Solar and Wind

On March 14, 2013, Virginia Governor Robert McDonnell signed HB 2334 into law. This new law directs the State Corporation Commission (SCC)



Shannon Huecker

to conduct a pilot program for allowing third parties to develop small solar and wind energy projects in Virginia. Under the pilot program, renewable energy generators

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# What's New

## Donna Attanasio Joins GW Law as Senior Advisor for Energy Law



Donna Attanasio

**D**onna Attanasio joined GW Law on July 1 as Senior Advisor for Energy Law Programs. Using a grant received from Constellation Foundation as seed money, Ms. Attanasio is tasked with making GW Law a center for thought leadership on law and policy for energy sustainability.

“GW Law has been teaching energy law for decades. The strength of its program is evident from the number of its graduates who are presently in leadership positions throughout the energy sector,” said Ms. Attanasio. “With the Constellation grant, the law school is launching an initiative that will build upon, complement, and enhance the existing curriculum, but reach well outside the campus to engage thought leaders from throughout the energy community.”

The mission of the new energy initiative is to advance economic growth, protect public health and the environment, and assure access to affordable, reliable, clean and sustainable energy resources, by:

- providing a forum for open debate on leading-edge energy policy issues;
- conducting research that significantly enhances the knowledge base related to sustainable energy law and policy;
- educating students, policy makers and industry participants on issues related to sustainable energy production and use based on factual and non-partisan analysis.

To achieve these goals, Ms. Attanasio’s work will include forming an advisory board and fund-raising for the initiative as well as establishing a research agenda and developing programming that will address a broad range of issues. Several conferences and roundtable discussions are in the planning stages for 2013-2014, with the expectation that the proceedings of these events will be published and, in some cases, serve as the stimulus for in-depth follow-on research. “In the coming months we also expect to create a website with a publicly available

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## Paddock Appointed to ABA Task Force on Sustainable Development



Lee Paddock

American Bar Association (ABA) President James Silkenat has appointed Lee Paddock, Associate Dean for Environmental Law Studies, to a new 20-member Presidential Task Force on Sustainable Development. The task force will make recommendations on the involvement of the ABA in implementing sustainable development matters throughout the world.

The announcement letter noted: “The Rio+20 Conference adopted a report titled ‘The Future We Want.’ The report is a common vision on how sustainable development issues will be managed by United Nations member entities and related organizations. The U.N. senior leadership has made it abundantly clear that implementation of the Future We Want report is imperative.”

The Task Force will focus on ways that the ABA can provide leadership, nationally and internationally, on sustainable development issues, as well as assisting the U.N. in implementing The Future We Want report. The recommendations will be presented to ABA President Silkenat in early summer 2014. ■

## GW Student Involvement in 2013 Energy Efficiency Global Forum

On May 20 and 21, 2013, several GW students and faculty members participated in the 2013 Energy Efficiency Global Forum (EE Global) in Washington, D.C. This event provided an opportunity for numerous stakeholders—including corporate executives, senior governmental officials, and industry experts—to convene and discuss issues and strategies relating to energy efficiency. The event was hosted by the Alliance to Save Energy, a nonprofit organization that promotes energy efficiency worldwide through research, education, and advocacy. Some of the key topics discussed during EE Global included how to drive energy efficiency policy and regulation through stakeholder engagement and education; how to create profitable investment opportunities for energy efficiency improvements and projects; and what



*Speakers at the 2013 Energy Efficiency Global Forum, for which GW Law faculty and students acted as reporters.*

role energy efficiency can play in terms of promoting grid reliability.

Two GW Law students, Kate D'Ambrosio (2L) and Jake Clark (3L) were selected to attend EE Global free of charge in exchange for their contribution as event reporters. Ms. D'Ambrosio, Mr. Clark, and adjunct faculty member Debra Jacobson wrote a total of nine summaries on the executive dialogue sessions at the event.

The 2014 EE Global Forum will also be hosted in Washington, D.C., from May 20–21. Ms. Jacobson expects that GW Law students will be invited to participate in the event again next year, and encourages interested students to take advantage of this unique opportunity. Students, alumni, and other interested parties can find additional information about the EE Global Forum at [eeglobalforum.org](http://eeglobalforum.org). ■

## GW's Role in the United Nations' Sustainable Energy for All Program

One of the major initiatives coming out of the United Nations Rio+20 meeting during the summer of 2012 was the launch of the "Sustainable Energy for All" (SEFA) program which is designed to find ways to provide access to energy for the more than one billion people worldwide who do not have access to reliable and affordable energy. Access to energy is

essential to reducing poverty, creating educational opportunities, and protecting health—especially the health of women and children.

Through its involvement as one of the co-sponsors of the World Bank initiated Global Forum on Law, Justice, and Development, GW is organizing a global effort to examine how law can either facilitate or hinder access to energy resources. GW's Environment and Energy program has led the development of a new "Legal Aspects of Sustainable Energy for All" Community of Practice (CoP) created under the auspices of the Global Forum's Thematic Working Group on Environment and Natural Resources. Associate Dean Lee Paddock serves as co-lead for the Thematic Working Group,

and he and GW Law's Senior Advisor for Energy Law Programs Donna Attanasio help lead the Community of Practice.

Members of the Community of Practice include the Environmental Law Institute; the Universities of Auckland, Ottawa, and Leicester; the International Development Law Organization; and the Getulio Vargas Foundation School of Law in Rio de Janeiro and other organizations.

The CoP's work plan focuses on identifying key legal barriers to sustainable energy for all projects, in-depth academic legal research on SEFA legal issues, legal education and training programs to support SEFA work, and a web-based SEFA Legal Resource Center. The CoP is now seeking funding to enable it to carry out the work plan. ■

## Paddock and Wentz Writing on Hydraulic Fracturing

The Academic Advisory Group (AAG) on Energy for the International Bar Association's Section on Environment, Energy, Resources and Infrastructure Law this year asked Associate Dean Paddock to join the Group. The AAG publishes a book every other year on energy law issues through Oxford University Press. The current book focuses on "Energy Underground," including issues related to nuclear waste disposal, carbon capture and storage, and hydraulic fracturing. Associate Dean Paddock

and Visiting Associate Professor of Law and Environmental Program Fellow Jessica Wentz have written a chapter examining the differing approaches taken by Pennsylvania and New York with respect to hydraulic fracturing. In

May Associate Dean Paddock traveled to New Zealand to meet with the other authors to coordinate work on the book and to present programs in Hamilton and Wellington. ■



Wairakei Geothermal Power Station, Taupo, New Zealand

## Upcoming Events

### 2014 J.B. and Maurice C. Shapiro Conference, Management / Public Lands



In spring 2014 GW Law and the University of Houston Law Center will co-sponsor a conference to examine the role of planning in federal land management. Each of the principal federal land

management agencies is required to engage in planning under its organic statute. The agencies also must conduct planning to comply with requirements under cross-cutting environmental and natural resource management laws such as the National Environmental Policy Act and the Endangered Species Act.

Although the agencies with jurisdiction over the federal lands had long used planning as a management tool, Congress enhanced the role of planning in 1976, when it adopted both the Federal Land Policy and Management Act (FLPMA) and the National Forest Management Act (NFMA). FLPMA declares that the nation's interest in its public lands can be best realized if those lands and the resources they contain "are periodically and systematically inventoried and their present and future use is projected through a land use planning process coordinated with other federal and state planning efforts." Similarly, the NFMA requires the Forest Service "to serve the national interest" by adopting a renewable resource program "based on a comprehensive assessment of present and

### GW Law to Co-Sponsor EBA Mid-Year Meeting

GW Law will co-sponsor the Energy Bar Association's 2013 Mid-Year Meeting, at which GW's Donna Attanasio will moderate

a panel titled "A PURPA Renaissance?" The conference, which will focus on current energy issues, will be held October 23–24,

2013, at the Renaissance Washington, D.C. Downtown Hotel, 999 Ninth Street, NW.

For registration information and additional information on the meeting go to: [www.eba-net.org/2013-mid-year-meeting-conference](http://www.eba-net.org/2013-mid-year-meeting-conference). ■



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## WRI Access Initiative Workshop



On September 25, 2013, the World Resources Institute (WRI) will host a workshop at GW Law to discuss recent work conducted by The Access Initiative (TAI) on topics such as access to information, access to public participation, and access to justice.

TAI, one of the centers of excellence at WRI, has been a pioneer in advocating the access rights of people in developing countries in the context of environmental decision making. TAI is conducting a brainstorming session with experts, academicians, lawyers, researchers, and members of international organizations and CSOs to review their research findings on global principles for ensuring

procedural justice to the public at large. These research findings have been compiled in the form of a guidebook and will be scrutinized by dignitaries in various sessions of the workshop.

The guidebook is an attempt to identify, collate, and simplify the fundamental administrative procedural principles to propagate administrative fairness in environmental decision making through effective laws and practices. The Access Team at WRI, under the stewardship of Mr. Lalanath de Silva, Director of TAI, drafted these annotated principles to protect the democratic rights of the public, especially the poor and marginalized, and to ensure a coherent governance structure in the context of Principle 10 of the Rio Declaration. Principle 10 mandates the states to improve the capacity of the public to access information and participate in the environmental decisions that will affect their lives and environment. The guidebook provides unbiased and effective legal guidelines to adopt or amend administrative procedures to mitigate systematic exclusions of any

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## Distributed Generation Workshop

This winter, GW Law will be hosting a one-day workshop on distributed generation (DG). This workshop will bring together academics, practitioners, and other experts to discuss some of the key legal and policy issues relating to the expansion and incorporation of DG systems into the electric grid. The workshop will examine the role of law and policy with respect to the financing, development, and interconnection of DG systems. Some potential topics include: how to structure utility planning practices to account for and potentially encourage DG development; how to create procurement opportunities for DG electricity; and how to overcome legal and technical obstacles to the expansion and integration of DG systems.

A date has not yet been set for the DG workshop. For additional information about the event, please contact Jessica Wentz, [jwentz@law.gwu.edu](mailto:jwentz@law.gwu.edu). ■

## Recent Events

### 2013 J.B. and Maurice C. Shapiro Conference

Last spring, GW Law hosted the 2013 J.B. and Maurice C. Shapiro Conference, "Laying the Foundation for a Sustainable Energy Future: Legal and Policy Challenges." The event was a great success, with dozens of attendees representing the government, academic, non-profit, and private sectors. Byron



(from left) James J. Hoecker, former Chair of the Federal Energy Regulatory Commission, now Senior Counsel and Energy Strategist at Husch Blackwell LLP; Marvin Griff of Husch Blackwell; Environmental Program Fellow Jessica Wentz; Associate Dean Lee Paddock; and Sarah Vail of Husch Blackwell

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# Academics

## New Courses

### Commodities Trading



Athena Eastwood

This fall adjunct faculty members Athena Eastwood and Peter Malyshev will be teaching a seminar titled Energy and Environmental Products Trading and Commodities Regulation. The course provides a comprehensive overview of commodities trading and regulation in the context of energy and environmental products

(from natural gas to carbon). The course explores who the market participants are and how they are regulated; the commoditization of environmental attributes and how they are used for renewable energy development and project finance; and historic commodity manipulations from Enron to LIBOR. Business students also will benefit from this course.

Professor Eastwood notes, “This course is a must-take for any student who is serious about working in the energy industry. Whether you are interested in pursuing a transactional, regulatory, or business fraud practice, it will give you the building blocks that you will need to help clients with a range of issues—from complex energy transactions to high stakes manipulation investigations.” ■

## International Environmental Governance



Scott Fulton, former General Counsel for EPA, will be returning to GW Law this spring to teach a seminar on international environmental governance. The course focuses on procedural questions relating to good environmental governance and examination of best practices that are applicable to many different domestic legal systems. In particular, the course examines governance precepts relating to regulatory coherence, access to information, public participation, government accountability, enforcement, and dispute resolution. Students enrolled in the seminar have the opportunity to write a research paper evaluating key aspects of environmental governance in the country of their choice. ■

## Summer Program on Comparative Energy Law in the United States, the Netherlands, and Brazil

In August three GW Law students travelled with Associate Dean Lee Paddock to Rio de Janeiro in order to participate in a week-long program on “New Developments in Comparative

Upstream Oil and Gas Law.” The program, which was hosted by the Getulio Vargas Foundation School of Law, provided an opportunity for GW Law students to collaborate with students from FGV Law and also from the University of Groningen in the Netherlands. The students were assigned to research teams in order to conduct comparative research on topics relating to the regulation of hydraulic fracturing or deep water offshore oil and gas production. Each student prepared an individual paper prior to the program start date, and also participated in a joint presentation with students from other universities while in Rio. ■



(from left) Associate Dean Paddock, 2L Joseph Baumann, 3L Sofya Zakharenko, and 2L Caroline Gignoux on a field trip in Brazil at the Petrobras Research Center.

# News From ELA

By Molly Masterton, JD '14  
ELA President 2013-14

The GW Environmental Law Association wrapped up another eventful year with a day hike at Great Falls National Park in Potomac, Maryland. JD and LLM student members mingled along the Billy Goat Trail, enjoying good company and beautiful sights. The roaring waters of the Potomac, heavy with May rainfall, metamorphic rocks, and congregations of nesting Great Blue Herons were among the views, right in the capital's backyard.

Earlier this spring, ELA hosted its annual Sustainability Week at the Law School. The event took place in March and featured a number of educational outreach events, including daily tables in the student lounge featuring topics ranging from local foods and sustainable agriculture to energy efficiency, a home plant potting event in coordination with GW Law's "Wellness Wednesday." A panel discussion centered on the U.S. Global Research Program's National Climate Assessment, and it included an interdisciplinary discussion of what current climate warming trends may mean for the fields of energy and environmental law. Featured panelists included Fred Lipschultz, NASA Representative to the National Climate Assessment, Floyd DesChamps, Senior Vice President for Policy & Research at Alliance to Save Energy, and Dan Moring, Program Manager for energy efficiency projects with IBC Engineering. Sustainability Week also included a networking event that allowed students to meet practitioners with private and public interest backgrounds in energy and environmental law.

ELA continues to grow in membership and influence, due in part to its collaboration with other student organizations and academic programs. Last year, members convened with other energy and environmental law students at a



*ELA Members celebrate summer weather and the end of the semester with a day hike at Great Falls Park in Potomac, Maryland.*



D.C. Area ELA Mixer, well attended by students from GW, Georgetown, Howard, and American University law schools. In January, ELA co-hosted a speaker event with GW's Student Animal Legal Defense Fund focused on the dovetailing issues of sustainable agriculture and farm animal welfare. Finally, ELA coordinates with the George Washington Office of Sustainability and other student sustainability groups outside of the Law School through the GW Sustainable Student Leaders program.

ELA kept busy over the summer. In July several students attended a networking event hosted by the Kirkland & Ellis Environmental Transactional

and Regulatory Practice Groups. It was a great opportunity for ELA members to network with GW Law alumni at Kirkland, and to learn about the emerging environmental transactions field of which our graduates are now a part. ELA plans to keep its momentum going forward this fall. To kick the year off and welcome new members, ELA will host a kayaking trip and an apple-picking excursion at a nearby organic farm. Other plans for the coming year include a professional panel on regulation of renewable energy technologies and a speed networking event. If you are in the D.C. area, we hope you will join us at one of our events! ■

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benefits to the grid.”<sup>2</sup> As evident from this definition, energy storage can serve as a source for electricity supply or can be used to support transmission operations. The Commission has specifically pointed to “hydroelectric pumped storage and compressed air energy storage, regenerative fuel cells, batteries, superconducting magnetic energy storage, flywheels, thermal energy storage systems, and hydrogen storage,” as examples of energy storage assets,<sup>3</sup> but that list is non-exclusive.

The need for energy storage is not new. Electric power generation and consumption must be kept in balance in order to maintain a stable grid. This is typically done by varying generation levels to respond to changes in consumption (load), both to meet daily and seasonal variations in load levels and moment-to-moment fluctuations. Energy storage in the form of pumped hydro and hydro with pondage has long been used to help with system balancing.

But newer technologies for electric energy storage, such as battery technologies,<sup>4</sup> flywheel technology, electrochemical capacitors and superconducting magnetic energy storage,<sup>5</sup> are becoming more cost-effective, and a host of applications for these new technologies are being explored in the context of the needs of today’s grid. These technologies have the capability to provide substantial value to the grid by helping to “move” energy from the period in which it is generated to the time it is needed; providing voltage and regulation service to help keep the grid stable and in balance; dampening load fluctuations; providing back-up power to end-users; and as operating reserves, to name only a few of the possible uses. The California Public Utilities Commission (CPUC) staff identified twenty potential applications for the California market.<sup>6</sup>

Storage has the potential to help defer new capital investments in generation, transmission and/or distribution by utilizing existing infrastructure more fully. For example, transmission upgrades may be deferred if generation is transmitted during off-peak hours into a



Beacon Power's 20 MW Stephentown Advanced Energy Storage plant. (Photo courtesy of Beacon Power, LLC)

region that is transmission-constrained during peak periods and then stored. Energy storage also has the versatility to be deployed at the distribution, or even end-user, level. For example, residential battery systems might store on-site solar generation for later use by the end-user or for sale to the grid during peak periods; or storage might be incorporated into a microgrid to balance the system and increase the capability of the microgrid to disconnect from the grid and operate as an island without a loss of reliability. As the Commission has acknowledged, energy storage “can operate in ways that resemble production, transmission, and/or distribution,” in some cases, performing multiple functions simultaneously.<sup>7</sup> With some projections of the capital expenditures necessary to upgrade the grid exceeding \$100 billion through 2020,<sup>8</sup> the potential for energy storage to

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*“[E]nergy storage can operate in ways that resemble production, transmission, and/or distribution—in some cases, performing multiple functions simultaneously.”*  
 .....

offer cost-effective alternatives to traditional infrastructure investments makes it inherently attractive.

Another part of the current appeal of energy storage is its ability to complement renewable energy resources. For example, solar thermal generation plants with molten salt storage can continue to put power into the grid after sundown; and battery storage is being used in conjunction with wind turbines to provide regulation service to the grid as well as smooth the delivery of wind power into the system. Indeed, one of the most significant barriers to the exponential growth potential of renewable electric power is that intermittent or variable energy resources (VER), such as wind and solar, often have limited ability to respond to a grid operator’s direction. For obvious reasons, they cannot generate in the absence of “fuel” in the form of wind or sun. Some grid-scale VER can follow a grid operator’s direction to ramp down, but in some cases, for example, small-scale rooftop solar, even that degree of flexibility is unavailable. As VER’s share of the market increases, they may displace resources historically used to follow load (by making it less economical to dispatch them). This shift can make the grid less flexible and/or make grid operation more expensive, particularly in low-load hours.<sup>9</sup> Further, peak generation periods for some VER do not coincide with peak periods of demand and output levels vary with

changes in the weather.<sup>10</sup> Contrast this with an energy grid's demand for constant and dependable power and the value of storage to support the operation of VER becomes apparent.

## Obstacles To Growth

Despite the versatility of storage, there are still obstacles to its full utilization. Bloomberg New Energy Finance and The Business Council for Sustainable Energy point to market structures that fail to provide proper compensation, high cost of the technology, difficulty of assessing the true value of potential applications, and economic factors, such as competition from low-cost gas, as the primary hurdles for storage in the United States.<sup>11</sup>

*“Despite the versatility of storage, there are still obstacles to its full utilization.”*

The good news is that the first three of these obstacles are being addressed, as discussed below, with government financial support, commercialization experience and recent regulatory initiatives. Even the last of these, competition from other sources such as natural gas, is being addressed, indirectly. As regulators develop tools to better assess the value of storage, and market systems develop that better compensate storage facilities for the value they provide, energy storage will be better able to compete.

## Government Support and Commercialization Experience

Government support has helped defray the cost of early storage system deployment and commercialization is underway. For example, under the American Recovery and Reinvestment Act, the U.S. Department of Energy (DOE) allocated \$185 million to storage projects, which supported \$585 million in private

investment. Grid-scale energy storage projects in the United States supported by DOE grants include Primus Power's 25-MW, 3-hour battery plant for the Modesto Irrigation District in California for wind smoothing; Xtreme Power/Duke Energy's 36-MW, 15-minute turnkey battery plant in No-Trees, TX, providing ramp control and smoothing for a 153-MW wind farm; and PG&E's 300-MW, 10-hour CAES project in California, to be used for load leveling, as a reserve, and for peak shifting.

In June 2011, FERC reported that Beacon Power Corp.'s “first flywheel energy storage plant in Stephentown, New York is in full operation. The 20-MW facility is the world's first grid-scale flywheel energy storage. It consists of 200 high-speed Beacon flywheels to provide fast-response frequency regulation services to the New York electricity grid.”<sup>12</sup> This project, which received a \$43 million U.S. loan guarantee, was sold to Stephentown Spindle, LLC in 2012.<sup>13</sup>

The AES ES Westover facility, a 20-MW advance lithium-ion battery facility that uses bidirectional inverters and DC battery subsystems, provides frequency regulation to the New York Independent System Operator, Inc. (NYISO). The project was supported by a DOE loan guarantee of \$17 million and entered service in phases beginning in 2010.<sup>14</sup> Now, AES Energy Storage has 174 MW of planned or operational storage capacity in North and South America.<sup>15</sup> AES Energy Storage's Laurel Mountain project, a 32-MW battery system located in West Virginia at the site of a 125-MW wind farm, which began operating in 2011, “provides frequency regulation in the PJM market while also being available to help manage the rapid rate of change of output that can occur with fluctuations in wind conditions.”<sup>16</sup> The Laurel Mountain project has now passed its 400,000 megawatt-hours (MWh) service milestone.<sup>17</sup> AES recently announced another project for the PJM area, a 40-MW battery array near Dayton, Ohio, bringing its total energy storage capability on the PJM system to over 100 MWs.<sup>18</sup>

California provides direct incentives to increase the use of storage on its grid. Under its Self Generation Incentive

Program (SGIP), “Advanced Energy Storage Projects” located at a customer site are entitled to an incentive payment of up to \$1.80/W (base level, before adjustments; compared to \$1.19/W for renewable generation, \$0.48/W for non-renewable, conventional CHP projects and \$2.03/W for CHP or electric fuel cells). For the purposes of the program:

Advanced Energy Storage Projects may be stand-alone or coupled with other SGIP eligible technologies or Photovoltaic systems. All Advanced Energy Storage systems must have the capability to discharge its rated capacity for a minimum of 2 hours and must be capable of discharging fully at least once per day. Advanced Energy Storage systems coupled with wind generation must have the ability to handle hundreds of partial discharge cycles each day.<sup>19</sup>

New products are now entering the market. General Electric has developed a new line of software applications that allow storage capability to be integrated into its wind turbine systems. Excess generation from periods of rapid ramping can be stored either for later sale as power supply or for frequency regulation.<sup>20</sup> At the distribution level, SolarCity is now offering battery storage to residential customers in some California locations. Using battery technology engineered by Tesla Motors, SolarCity advertises that the new systems will allow a homeowner to maintain power during a blackout.<sup>21</sup>

The number of operational and developing projects<sup>22</sup> suggests that investors and market participants can see the potential value of energy storage. Operating projects, including those that were facilitated by governmental financial support, provide an empirical source of data on operations, effectiveness and cost which should help stimulate new investment and help regulators and investors better assess the costs and benefits of proposed new storage projects as well as the stumbling blocks. But in order to push forward (without leaving scores of bankrupt start-ups in the wake of progress), an appropriate regulatory structure that provides for predictable cost recovery and a stable environment for growth

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is needed. Increasingly, regulators are recognizing and addressing these issues.

## Regulation of Storage in the United States

As the CPUC staff aptly points out, the absolute cost of energy storage is not as important as its cost effectiveness, taking into account “the full range and types of costs and benefits” provided by storage.<sup>23</sup> However, evaluating the business case for storage is difficult. Our traditional regulatory structures are based on function, but the versatility of storage turns the paradigm on its head. As noted in a staff report issued by the CPUC, “regulators do not yet know how [electric energy storage] costs and benefits should be allocated among the three main elements [i.e., generation, transmission and distribution] of the electric system.”<sup>24</sup> Adding even more complexity, the different benefits, and the proportion of each of those benefits, provided by an asset depends on how the asset is deployed. And where storage is only one of several possible solutions to a problem, it might be necessary to compare the cost of the storage solution to alternative solutions using generation, transmission or some combination of investments, where each alternative provides a different mix of benefits and disadvantages.

Methodologies to address this challenge are emerging. A new Sandia

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*“[E]valuating the business case for storage is difficult. Our traditional regulatory structures are based on function, but the versatility of storage turns the paradigm on its head.”*  
 .....

National Laboratories Report, “DOE/EPRI 2013 Electricity Storage Handbook in Collaboration with NRECA” (July 2013) provides guidance for regulators and investors for valuing and procuring storage assets.<sup>25</sup> Studies on measuring the cost-effectiveness of storage for the California grid are also available.<sup>26</sup> Taking another approach, the Public Utility Commission of Texas (PUCT) recently granted ERCOT authority to conduct pilot projects, which would provide comprehensive data for each particular proposed deployment of storage technology in a pilot under the actual conditions in which it would operate.<sup>27</sup>

FERC has looked at energy storage as both transmission and generation. In 2010, FERC found that storage devices using sodium sulfur batteries, which Western Grid Development, LLC (Western Grid) proposed to install on the California grid, would be wholesale transmission facilities.<sup>28</sup> Western Grid explained that the devices would function similarly to capacitor banks and operate at the direction of the California Independent System Operator Corporation (CAISO) to provide voltage support and help mitigate transmission overloads. Western Grid distinguished the facilities from generation because the units would absorb and discharge electric energy, not convert one form of energy into another. It proposed to install its devices on the CAISO grid and collect a cost-of-service rate through the CAISO tariff, as do other owners of transmission operated by CAISO.

FERC found that Western Grid’s devices would be transmission facilities, if operated as proposed.<sup>29</sup> The finding turned specifically on Western Grid’s proposal that it would purchase the energy needed to charge the facilities and receive a retail credit for discharge, but would not retain any differential, and would not arbitrage wholesale energy market prices.<sup>30</sup> Any revenue gained from charging and discharging energy would be credited back to customers. Over the objections of several intervenors, FERC also found that Western Grid would be entitled to receive certain rate incentives that are available pursuant to Section

219 of the Federal Power Act (FPA)<sup>31</sup> for transmission that benefits consumers by “ensur[ing] reliability and reduc[ing] the cost of delivered power by reducing congestion.”<sup>32</sup> In making this somewhat controversial finding to treat the batteries as transmission, eligible to receive incentives, FERC recognized, “storage devices can resemble any of [generation, transmission or distribution] or even load.”<sup>33</sup>

In contrast, in 2010, FERC found AES ES Westover, LLC to be an “exempt wholesale generator,” or “EWG,” which is, by definition, an entity engaged directly and exclusively in the generation and sale of electric energy. As noted above, AES ES Westover owns and operates a lithium-ion battery facility. However, unlike the Western Grid facility, AES ES Westover proposed to use the facility to sell ancillary services, specifically, Regulation and Frequency Response Service, to the NYISO.<sup>34</sup> Accordingly, it sought and obtained market-based rate authority from FERC.<sup>35</sup> AES Laurel Mountain and Stephentown Spindle LLC are also EWGs.<sup>36</sup> Thus, all three projects have a status reserved for generators, not transmission providers.

Storage facilities capable of providing frequency regulation are benefiting from FERC’s Order No. 755, which required regional transmission organizations and independent system operators under its jurisdiction to develop two-part rates for frequency regulation service; the specific rates payable would be determined by the market. Specifically, the Commission required (i) a capacity payment that includes the marginal unit’s opportunity costs, payable to all frequency regulation service providers that clear the market, and (ii) a payment for performance that would reward providers that more accurately follow the dispatch signal, upward or downward.<sup>37</sup> While the benefits of Order No. 755 are not directed solely to energy storage providers, to the extent that storage providers are able to provide superior service, they will be entitled to payments that reflect their superior performance.

In addition, on July 18, 2013, FERC issued Order No. 784, a final rule setting forth the required accounting treatment

for energy storage and creating the necessary accounts within the Uniform System of Accounts (the accounting system required of FERC-jurisdictional utilities with cost-based rates, used in reference to rate-making). Of note, FERC specified that “[w]here energy storage equipment can perform more than one function or purposes, the cost of the equipment shall be allocated among production, transmission, and distribution plant based on the services provided by the asset and the allocation of the asset’s cost through rates approved by a relevant regulatory agency.”<sup>38</sup> Thus, FERC’s accounting rules reflect the multiple values storage can provide to the grid. Additional changes include a methodology for accounting for the “fuel” costs of charging or maintaining pressure (as required by the resource) and specifying depreciation treatment.<sup>39</sup> Although Order No. 784 is nominally an accounting and reporting rule, it provides energy storage providers with greater clarity as to how their rates will be determined and, thus, their costs recovered. FERC also amended its form of annual reports to collect more data on the costs and deployment of storage.<sup>40</sup>

*“FERC’s accounting rules reflect the multiple values storage can provide to the grid.”*

Some states are also beginning to directly confront the regulatory issues that surround storage. In 2012, the CPUC based its approval of cost recovery for two power purchase agreements on energy storage considerations: One (without storage) it deemed a “necessary step in the evolution of BrightSource’s technology development to build and finance the third generation power towers with molten salt storage that provide much greater value for California ratepayers.”<sup>41</sup> The other, Brightsource’s Sonoran West project, which would include molten salt storage, was approved because it would

“allow SCE to optimize generation from this facility based on changing system requirement. This unique attribute decreases renewable integration risk and provides more value for ratepayers.”<sup>42</sup>

The Texas Legislature passed legislation requiring storage owners and operators to register as generators and providing interconnection rights, which the PUCT incorporated into its regulations.<sup>43</sup> (As pointed out on DOE’s website, however, “The bill does not address the use of energy storage as a transmission asset.”<sup>44</sup>) In other proceedings, the PUCT directly addressed the issue of when to treat the consumption of electricity by a storage facility and its auxiliary components as a retail (versus wholesale) transaction, taking into consideration whether there are additional consuming components served by the storage facilities and multiple ownership scenarios.<sup>45</sup> Addressing in detail the financial regulations applicable to energy storage upfront better enables potential investors to evaluate storage as an investment opportunity and provides the certainty necessary to attract capital.

Storage still presents challenges. While predictable cost recovery is critical to attracting investors, and some progress is being made on that front, it is also essential that planning processes be open and transparent, and that RFPs are inclusive enough to encompass storage-based proposals, so that innovative storage projects are given the opportunity to be considered. Although FERC has sought to open the transmission system planning process through Order Nos. 890 and 1000, integrated resource planning, particularly for generation, remains the province of the states (to the extent it is done at all). The value of some multifaceted storage projects may be outside the scope of consideration in either forum and thus not deemed cost effective.

Moreover, while storage projects are beginning to compete in organized markets for generation-based ancillary services where compensation is awarded at competitive rates, cost recovery through cost-based rates for transmission investments, including storage-based projects, by a non-incumbent (would-be)

*“Addressing in detail the financial regulations applicable to energy storage upfront better enables potential investors to evaluate storage as an investment opportunity and provides the certainty necessary to attract capital.”*

transmission provider in non-RTO service areas is still problematic. And even when storage providers have an opportunity to sell services at competitive rates, commercial practices are still evolving. For example, while most renewable power projects sell power “as available,” the addition of storage capability enables some degree of dispatchability. Thus, when negotiating a bilateral contract for the sale of unit power from a project with storage capability, the parties must integrate the cost of “charging” the resource into the project economics, consider how the storage may be used by the purchaser, by whom and under what conditions the dispatch rights may be exercised, and the impact on project revenues.

## Conclusion

The technical capability, cost-effectiveness and regulatory environment for storage are all still evolving. Investors have already seen the potential, and the incremental growth of storage—proposed and operational—heralds a potentially bright future. But regulators need to provide clear guidelines for its treatment, planning processes need to be opened to include storage, and markets need to reward its benefits, in order to support its integration into the grid and realize storage’s full potential.

*continued on page 18*

# In Print

## Steve Charnovitz



“Environmental Sustainability and Competitiveness: Policy Imperative and Corporate Opportunity,” (with Daniel C. Etsy) Harvard Business School, Project

on U.S. Competitiveness, March 2013, [bit.ly/charnovitz\\_HBS](http://bit.ly/charnovitz_HBS).

“International Trade and Investment Law and Carbon Management Technologies” (with Nigel Bankes, Anatole Boute, Shi-Ling Hsu, Sarah McCalla, Nicolas Rivers & Elizabeth Whitsitt), and *Natural Resources Journal*, Summer 2013, at 285–324.

## Rob Glicksman



### Articles

“A Comparative Analysis of Accountability Mechanisms for Ecosystem Service Markets in the U.S. and the EU,” 10

*Transnational Environmental Law* 1 (2013) (with Thoko Kaime) (June 2013).

“Improving Water Quality Anti-degradation Policies,” 4 *Journal of Energy and Environmental Law* 1 (2013) (with Sandi Zellmer).

### Books

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## Reports and White Papers

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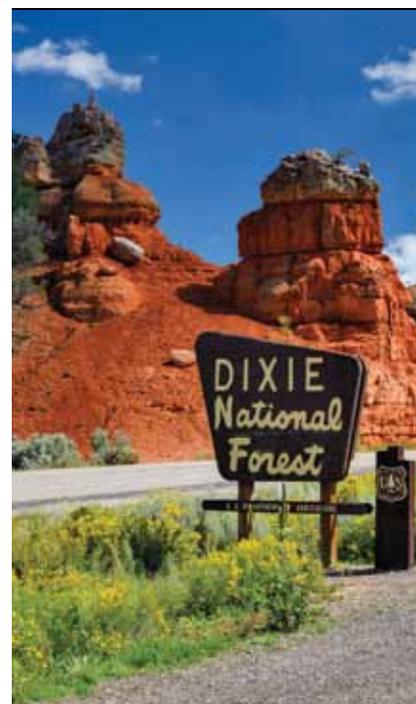
“No Profit in Pollution: A Comparison of Key Chesapeake Bay State Water Pollution Penalty Policies,” Center for Progressive Reform Briefing Paper # 1305 (April 2013) (with A. Simpson). [bit.ly/Glicksman\\_WP1305](http://bit.ly/Glicksman_WP1305). ■

2014 Shapiro Conference from page 4

anticipated uses, demand for, and supply of renewable resources from the nation’s public and private forests and rangelands, through analysis of environmental and economic impacts.” NFMA requires several levels of planning, ranging from planning that is national in scope to planning directed at individual units of the National Forest System. Under both statutes, site-specific actions must be consistent with previously adopted plans. The National Park Service and the U.S. Fish and Wildlife Service also operate under planning mandates. The need for planning has become even more acute as the potential for climate change to disrupt ecosystem functioning on the federal lands has become increasingly clear.

This conference will explore how successfully the federal land management agencies and other agencies whose missions include protecting federal lands and resources have incorporated long-term planning practices into their resource management strategies and whether Congress’s vision of a management regime based on planning has improved protection and use of federal lands and resources. It will also identify opportunities for improvement and innovation in current planning practices.

The conference will take place on March 13 and 14, 2014, in GW Law’s Jacob Burns Moot Court Room. For additional information about event details and registration, please contact Jessica Wentz, [jwentz@law.gwu.edu](mailto:jwentz@law.gwu.edu). ■



# Profiles

## Kathleen Oprea, JD '13



*Kathleen Oprea being presented with an ABA student writing award by Jeffrey Dennis, Director of Policy Development, Federal Energy Regulatory Commission.*

**K**athleen Oprea first became interested in environmental law during college, when she was an extern at the Department of Justice (DOJ) Environment and Natural Resources Division's Public Policy section. She graduated from Dartmouth University with a double major in environmental studies and economics and integrated these fields into a final thesis in which she explored economic projections of climate change effects under various scenarios. By the time she applied to law school, she knew she wanted to pursue a career in environmental law.

Ms. Oprea began her legal studies at Emory Law School in Atlanta, but says she "quickly realized that there were more opportunities for environmental coursework as well as externship opportunities in Washington, D.C., and particularly at GW Law." She notes that she was very happy with her decision to transfer, because during her 2L fall semester she was able to take several environmental law courses and also participate in GW's Intensive Clinical Placement Program

with the Environmental Law Institute. She found that this placement was both interesting and enlightening because she had the opportunity to meet many students who were also passionate about environmental law and learn from their experiences.

While at GW Law, Ms. Oprea also had an externship with EPA's Office of Enforcement and Compliance Assurance in the Waste and Chemical Enforcement Division as well as FERC's Office of Administrative Litigation. She found that:

"EPA, in particular, has a fantastic externship program where school-year externs are provided with the mentors and weekly programming to teach an overview of specific environmental law topics. Working at FERC's Administrative Litigation Office was fantastic for my career development since I had worked at a private energy law firm during my 2L summer, representing many clients who were involved in FERC Administrative litigation. Furthermore, I developed my understanding of the administrative litigation process, which will be helpful in my upcoming clerkship with the judges of the Atomic Safety and Licensing Board Panel at the Nuclear Regulatory Commission."

After her clerkship, Ms. Oprea intends to work in the field of energy and environmental law.

*.....*

*"Working at FERC's Administrative Litigation Office was fantastic for my career development since I had worked at a private energy law firm during my 2L summer, representing many clients who were involved in FERC Administrative litigation."*

*.....*

Ms. Oprea recently won an American Bar Association (ABA) writing award for her paper, "Development At the Expense of Culture—Cooperation Needed to Achieve Sacred Site Protection and Effective Land Management." The paper discusses the current statutory authority for BLM to conduct land exchanges on public lands, focusing on the particular situation of the Quechan tribe and how the consultation process under FLPMA, NEPA, and NHPA disadvantages both Indian tribes and federal government agencies with regards to protection of sacred Indian sites. In her paper, Ms. Oprea proposes several potential solutions by modifying and streamlining the consultation process required by these statutes and by including "religious use" in the definition of "undue degradation" which is prohibited by FLPMA. Ms. Oprea notes:

"The need for new transmission development to support renewable and alternative energy technologies is a major driver in my research, but I did not understand how it fit into a broader public lands law issue until I read about the specific case of the Quechan Tribe. In 2012, the Quechan Tribe filed a lawsuit to stop the development of a large wind farm on public land in California, claiming that the development would affect sacred ground which, although it was not on their reservation, the Bureau of Land Management is obligated to respect. There is a complex statutory framework for development on public lands and the consultation process can end up creating problems for both tribes and the agencies. Having the opportunity to attend the Public Lands Law Section Conference in Montana further opened my eyes to the ways in which public lands law is connected to energy and environment issues in so many ways. I hope to continue to learn more about this area."

Ms. Oprea's paper was published on the ABA website, and is available at [bit.ly/Oprea\\_paper](http://bit.ly/Oprea_paper). ■

## Molly Masterton, JD '14



In a small Maine town, Molly Masterton grew up exploring nature within a stone's throw of Maine's working waterfronts. She credits her childhood with fueling her early interest in the convergence of ecology and society. As an undergraduate at Bowdoin College, Ms. Masterton completed an interdisciplinary course of study centered on environmental science, ecology, and natural resources economics and policy. She then worked as an environmental educator with the Wildlife Conservation Society at their flagship location, the Bronx Zoo. In addition to the "magic of connecting children with nature," Ms. Masterton says that one of the more memorable aspects of this position was regularly handling animals such as fennec foxes and juvenile American alligators in the classroom. Having also worked with environmental groups on state-based policy initiatives, Ms. Masterton opted for law school as a capstone, allowing her to integrate her backgrounds in environmental science and public outreach and to approach environmental advocacy with new depth.

Ms. Masterton sought a law school that would actively prepare her for a career in environmental law in the public sector. A package that she received from the GW Environmental and Energy Law Program left a great impression—including a prospectus of 30 plus course offerings and a personalized letter from LeRoy Paddock, Associate Dean for Environmental Law Studies—and it was not long before she decided on GW. Of particular appeal to Ms. Masterton was GW's location in the nation's capital: "Studying law in DC has opened up a world of internship and networking opportunities that would not be available to me anywhere else. It has also allowed me to take seminars in a variety of niche areas of environmental law, taught by adjunct professors who share with us their valuable experiences in government work or private practice." Ms. Masterton had the opportunity to take the first offering of International Environmental Governance with former General Counsel of the EPA, Scott Fulton, and found the course to be exemplary of the unique GW experience.

One niche that Ms. Masterton has pursued is wildlife law. Her first summer internship was as a law clerk for the Department of the Interior's Office of the Solicitor, with a focus on

counseling the U.S. Fish and Wildlife Service and National Parks Service. She describes her first internship as a auspicious fit with her wildlife conservation background and an excellent opportunity to see conservation issues from the perspective of the federal government. She has continued to pursue wildlife law, taking a course on the subject and working part time with the National Audubon Society's Policy Office as an extern during two semesters. She spent this past summer as a law clerk with the Conservation Law team at Defenders of Wildlife, where she gained substantive litigation experience and drafted multiple amicus briefs for high-profile Endangered Species Act cases.

Ms. Masterton has also tailored her academic experience at GW to allow her to remain a generalist in environmental law, and she has several forthcoming publications on varying emerging topics in the field. After becoming interested in environmental and human health concerns surrounding nanotechnology during a summer course, she began working as a faculty research assistant for Associate Dean Lee Paddock, researching environmental governance of nanotechnology and synthetic biology. They are co-authors of a book chapter on the topic, and in December Ms. Masterton had the opportunity to present the paper in San Francisco at the annual conference of the Society for Risk Analysis. During her second year, she researched green business practices with the dispute resolution organization RESOLVE as part of the Energy and Environmental Policy Practicum. The resulting report was a "Sustainable Business Toolkit," which provided information on a variety of practices, including green supply chain management and certification systems, and offered recommendations for businesses. Ms. Masterton is currently working with Associate Dean Paddock to produce a publication on private enforcement mechanisms that will incorporate this work. Finally, Ms. Masterton serves as a Notes Editor for GW's *Journal of Energy and Environmental Law* (JEEL),

*"Ms. Masterton sought a law school that would actively prepare her for a career in environmental law in the public sector. A package that she received from the GW Environmental and Energy Law Program left a great impression..."*

working with students to develop notes on a variety of current issues. Her own note, which explores the role of adaptive management in development of marine and hydrokinetic energy projects, is due to be published in JEEL this academic year.

Now in her third year, Ms. Masterton serves as President of the Environmental Law Association (ELA), and the public outreach aspect of the role has been a highlight of her time at GW. ELA's work aims to connect fellow students

with current events, job and research opportunities, the outdoors, and each other. This year, Ms. Masterton hopes to use Sustainability Week in the spring as a culmination of all of these goals. She has also kept herself busy this fall exploring environmental policy issues from yet a new perspective with the Shapiro Congressional Fellowship program, through which she is interning with Congressman Joe Garcia and tracking legislation in the House Committee on Natural Resources. In her free time, Ms.

Masterton enjoys birding at Huntley Meadows Park in Virginia and playing fetch with her cat, Fern. Going forward, She hopes to gain additional litigation experience, ideally with an organization that allows her to touch upon an array of emerging environmental issues. She has a long-term goal of returning to Maine to focus on regional environmental and energy policy. ■

*Read Molly Masterson's report on ELA's recent and upcoming activities on page 7.*

*Donna Attanasio from page 2*

electronic repository for the work developed under the program," said Ms. Attanasio. "I also want to launch an event series that allows our students to engage directly with practitioners and brings more of our alums from the energy sector on campus."

Prior to joining GW Law, Ms. Attanasio was in private practice, most recently as a partner at White & Case LLP, where she chaired its renewable energy task force, and previously at Dewey Ballantine LLP and Sutherland, Asbill & Brennan. Over the 24 years she spent in private practice, her clients included investor-owned utilities, independent generation developers, power marketers, large industrial consumers, lenders, and equity investors.

Ms. Attanasio's interest in energy policy preceded law school: "I became interested in the topic of government economic regulation during my junior year in college, through a course taught by Professor Ken Gordon (who subsequently chaired the public utilities commissions of Maine and Massachusetts and later became a consultant to NERA). The course covered a number of industries, including telephones and railroads, but it was energy, in particular electric utilities, that I found most interesting,

In the 1970s, energy was in the news often – but not in a good way: the oil embargo, gas lines, subsidies for ethanol produced from corn, power plant construction cost overruns, and then Three Mile Island. President Carter tried to implement a visionary energy policy, famously putting on his sweater to encourage us all to conserve energy, and became hugely unpopular. But I was hooked. I've been involved in the energy industry for over three decades, and although the issues have changed, they are still overwhelming. Having the opportunity to build a program at GW Law that is committed to exploring the issues and developing solutions was simply too interesting to pass up."

Ms. Attanasio is a past president of the Energy Bar Association, and ranked among the outstanding practitioners in energy law by Chambers U.S.A., Chambers Global, Legal 500, Best Lawyers in America and Super Lawyers. In June 2013, she was the recipient of Euromoney LMG's Americas Women in Business Law Award for the category of Energy, Natural Resources and Mining. Ms. Attanasio received her J.D. from Harvard Law School and an A.B. in Economics from Smith College. Prior to entering law school, Ms. Attanasio administered energy conservation and load management programs for Potomac Electric Power Company. ■

*WRI Workshop from page 5*

class of people at the will of government agencies.

GW Law has been instrumental in the development of the guidebook through an international LLM student who has been engaged in TAI's research through the school's Energy and Environmental Law Practicum. The workshop is open to students and faculty of the Law School.

The goal of the workshop is to achieve the following objectives:

- To identify the gap between administrative law and practice with regard to procedural rights of communities and the public;
- To recognize the adverse impacts of this gap that affect procedural rights of the public and communities; and,
- To develop a set of procedural principles that governments must abide by in making decisions that affect rights of the public or communities.

For additional information about the workshop, please email Naysa Ahuja, [nahuja@wri.org](mailto:nahuja@wri.org), or Jessica Wentz, [jwentz@law.gwu.edu](mailto:jwentz@law.gwu.edu). ■

Student Research continued from page 1

will be able to enter into third-party Power Purchase Agreements (PPAs) with on-site customers to provide solar and wind-powered energy under specified circumstances. The authorized projects include solar or wind generation facilities with a capacity of 50 kilowatts to 1 Megawatt (MW), and the aggregated capacity of all facilities cannot exceed 50 MW. As noted by Professor Debra Jacobson, this new law represents a “significant step forward” for third-party renewable energy projects in Virginia.

Two GW Law students—Lauren Eckhardt Snyder and Shannon Huecker—conducted research on PPA legislation which helped Members of the Virginia General Assembly, the Virginia Alternative and Renewable Energy Association (VA-AREA), the MD-VA-DC Solar Energy Industries Association, and other stakeholders to win the debate on HB 2334. The VA House of Delegates had enacted much more sweeping legislation supporting third-party solar development in 2012, but their initial efforts failed because of opposition from some stakeholders such as Dominion Virginia Power. For the 2013 session, VA-AREA and other stakeholders managed to reach a compromise agreement that successfully passed both houses with very little opposition.

Ms. Snyder began researching this issue in the Spring of 2012 under the direction of Professor Jacobson. She wrote a research paper as part of her

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debate on HB 2334.”*

Energy and Environmental Law course, which analyzed the reasons why the 2012 PPA Legislation ultimately failed. In her paper, Ms. Snyder examined PPA policies in other states, focusing in particular on a successful statute in Colorado, and she rebutted many of the arguments that had been cited against the legislation in the VA State Senate. Ms. Snyder notes that her research was informed by multiple

interviews with local policymakers and stakeholders, such as Jeff King, the Principal Environmental Planner at the Metropolitan Washington Council of Governors, who helped her to identify both the arguments in favor and the arguments against PPA legislation in the state. Ms. Snyder also notes that some of the issues she highlighted in her paper (e.g., the need to simplify the PPA legislation and remove provisions relating to Net Metering) were actually addressed in the final version of HB 2334.

Shannon Huecker continued with the PPA research in the Fall of 2012 in the Law School’s new Energy and Environmental Law Practicum course. Building off of Ms. Snyder’s analysis and recommendations, Mr. Huecker drafted sample PPA legislation for Virginia, which incarnated key elements from the Colorado PPA bill as well as other state laws. Based on his research, Mr. Huecker says he is “glad that the Virginia legislature has chosen to explore the benefits of third-party power purchase agreements,” and “confident the pilot program will show that third-party PPAs have the potential to greatly expand implementation of solar resources in Virginia, can help improve the main power grid’s reliability, and do not result in a net decrease in state tax funds.”

According to Anthony Smith, the CEO of Secure Futures, VA-AREA used Snyder and Huecker’s research “to inform our coalition about PPA objections and responses.” VA-AREA was ultimately successful in developing and negotiating a compromise bill, which received support from Dominion Virginia Power and other key stakeholders. VA-AREA made the following comments regarding the final version of HB 2334:

“The [renewable energy] industry has a great opportunity with this pilot program to demonstrate the demand for and the benefits of these types of projects. Whether the pilot program expands in the future will depend on a variety of issues, but for now, the industry has a new path for project development and financing, so take advantage of it and set a positive example for the contributions this industry has to make here in VA.” ■



2013 Shapiro Conference from page 5

Dorgan, former U.S. Senator and Senior Fellow at the Bipartisan Policy Center gave the keynote address, in which he summarized some of the key challenges and issues relating to sustainable energy development.

Following Senator Dorgan's opening remarks, the first day of the conference consisted of four panels that focused on four different considerations in sustainable energy policy: environmental sustainability, economic sustainability, national defense, and societal equity.

The second day consisted of more focused panels, which answered questions such as: How can we deploy the necessary capital for sustainable energy projects? How can technological development contribute to sustainable energy objectives? How do we develop energy policy in the context of federalism, and how should regulatory authority be divided between state and federal regulators? And, how can we balance sustainable energy development with other environmental goals, particularly in the context of project siting decisions?

The conference concluded with a panel discussion between six experts: Lee Paddock, Associate Dean for Environmental Legal Studies; James Hoeckler, Senior Counsel at Husch Blackwell and former FERC Chairman; Charles Berardesco, General Counsel for North American Electric Reliability Corporation; R. Darryl Banks, Vice President for Energy Policy at the Center for American Progress; Brian Castelli, Executive Vice President for Programs and Development at the Alliance to Save Energy; and Donald Santa, President and CEO of the Interstate Natural Gas Association of America.

One of the key issues discussed during the conference was the emerging role of distributed generation systems and their contribution to a sustainable energy future. In order to follow up on this topic, GW Law will be hosting a one-day workshop on distributed generation in the winter of next year. Additional details about this event will be available at [www.law.gwu.edu/environmental](http://www.law.gwu.edu/environmental) in the coming months. ■



(from left) Professor Robert L. Glicksman, Andrea Huber (Jamie Grodsky's sister), Dr. Gerold Grodsky (father), Joel Meister (winner of 2013 Jamie A. Grodsky Prize for Environmental Law Scholarship), Dean Maggs, Associate Dean Paddock. The Grodsky Prize, funded by a generous gift from Dr. Gerold Grodsky in his daughter's memory as well and memorial gifts from her friends, recognizes an original paper by a GW Law student in the environmental field. The Prize is awarded at the annual Shapiro Conference.



Keynote speaker Senator Byron L. Dorgan

# Endnotes

<sup>1</sup> This article updates, and relies in part, on “Energy Game Changer: Electric Storage Systems” by Donna M. Attanasio and Landis Wood, published by White & Case LLP, October 2012. The author thanks Mr. Wood and White & Case LLP for their contribution and permission to reuse the content.

<sup>2</sup> Third-Party Provision of Ancillary Services; Accounting and Financial Reporting for New Electric Storage Technologies, Order No. 784, 144 FERC ¶ 61,056 at P 172 (2013)(note omitted) (“Order No. 784”).

<sup>3</sup> *Id.*

<sup>4</sup> Including: sodium sulfur, flow batteries, lead acid, advanced lead carbon and lithium ion.

<sup>5</sup> Cal. Pub. Utils. Comm’n, Policy & Planning Div., Staff White Paper, Electric Energy Storage: *An Assessment of Potential Barriers and Opportunities*, at 4 (July 9, 2010) (“CPUC White Paper”) (identifying superconducting magnetic energy storage as being capable of storing energy “indefinitely with low loss” and “discharg[ing] almost instantaneously with high power output for a brief period of time with less loss of power than for other technologies”), www.cpubc.ca.gov/NR/rdonlyres/71859AF5-2D26-4262-BF52-62DE85C0E942/0/CPUCStorageWhitePaper7910.pdf.

<sup>6</sup> *Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems*, C.P.U.C. D.12-08-016, Decision Adopting Proposed Framework for Analyzing Energy Storage Needs, at 23 (issued Aug. 6, 2012).

<sup>7</sup> *Third-Party Provision of Ancillary Services; Accounting and Financial Reporting for New Electric Storage Technologies*, 139 FERC ¶ 61,245 at P 67 (2012); *id.* at P 55.

<sup>8</sup> Ashley Halsey III, *Aging power grid on overload as U.S. demands more electricity*, Wash. Post, Aug. 1, 2012, A1.

<sup>9</sup> See Cal. Indep. Sys. Operator, Corp., *Integration of Renewable Resources, Operational Requirements and Generation Fleet Capability at 20% RPS*, at 92-93 (Aug. 31, 2010), www.caiso.com/Documents/Integration-RenewableResources-OperationalRequirementsandGenerationFleet-CapabilityAt20PercRPS.pdf (identifying grid issues and recommending, among other things, use of tools that would provide greater operational flexibility).

<sup>10</sup> On June 22, 2012, FERC issued Order No. 764, requiring VER to provide meteorological and forced outage data to their interconnected transmission provider in order to improve forecasting of VER generation. *Integration of Variable Energy Resources*, Order No. 764, 139 FERC ¶ 61,246 (2012). In the same order, FERC directed transmission providers to offer intra-hour scheduling, with the intent that more granular scheduling will provide greater accuracy as VER adjust their operations throughout the day in response to prevailing conditions. Such measures improve the ability of the grid operator to predict and react to changes in VER output. But notwithstanding such improvements in predicting and managing the variability, the output remains subject to the forces of nature.

<sup>11</sup> Bloomberg New Energy Finance, “Sustainable Energy in America 2013 Factbook,” at 56 (Jan. 2013/revised July 2013), www.bcse.org/factbook/pdfs/BCSE\_BNEF\_Sustainable\_Energy\_in\_America\_2013\_Factbook.pdf.

<sup>12</sup> Fed. Energy Regulatory Comm’n, Office of Energy Projects, Energy Infrastructure Update for June 2011 at 3, www.ferc.gov/legal/staff-reports/06-11-energy-infrastructure.pdf.

<sup>13</sup> *Stephentown Regulation Servs. LLC*, 138 FERC ¶ 62,193 (2012) (“Stephentown”); Notice of Consummation, Docket No. EC12-68-000 (filed March 8, 2012).

Beacon Power Corp. filed for bankruptcy in October 2011.

<sup>14</sup> *AES ES Westover, LLC*, 131 FERC ¶ 61,008 (2010); Notice of Change In Status in Ownership or Control of Generation and Transmission Facilities, Docket Nos. ER10-3142-003, et al., Appendix B at 1 (filed Dec. 23, 2011); AEE2, L.L.C., 134 FERC ¶ 61,096 at P 4 (2011).

<sup>15</sup> *AES to Expand Energy Storage Presence in PJM Market with First Advanced Energy Storage Facility in Ohio*, AES News Release (Aug. 18, 2013), www.aesenergystorage.com/news/aes-expand-energy-storage-presence-pjm-market-first-advanced-energy-storage-facility-ohio.html.

<sup>16</sup> *AES Energy Storage Projects, Laurel Mountain*, www.aesenergystorage.com/projects.html. See also AES Laurel Mountain, LLC, Docket No. EG11-10-000, Notice of Self-Certification as an Exempt Wholesale Generator (filed Nov. 9, 2010) (“AES EWG”).

<sup>17</sup> *AES to Expand Energy Storage, supra.*

<sup>18</sup> *Id.*

<sup>19</sup> 2013 Self-Generation Incentive Program HANDBOOK at Sec. 4.2.6. (Feb. 1, 2013), www.cpuc.ca.gov/NR/rdonlyres/0DDABA86-9DF1-41C7-AD08-FF5B25155FA/0/2013\_SGIP\_Handbook\_v1.pdf (viewed August 9, 2013).

<sup>20</sup> GE Wind Energy Storage, www.ge-energy.com/wind/battery.

<sup>21</sup> SolarCity Home Energy Storage, www.solarcity.com/residential/energy-storage.aspx.

<sup>22</sup> See DOE International Energy Storage Database (beta), www.energystorage-exchange.org/ (identifying 348 projects, 268 of which are operational, when viewed on Aug. 19, 2013); “Nearly 40 New Advanced Energy Storage Projects Kicked Off in the First Half of 2013,” Navigant Research news release (Aug.

8, 2013), [www.navigantresearch.com/newsroom/nearly-40-new-advanced-energy-storage-projects-kicked-off-in-the-first-half-of-2013](http://www.navigantresearch.com/newsroom/nearly-40-new-advanced-energy-storage-projects-kicked-off-in-the-first-half-of-2013) (reporting 633 projects in operation or development, using 29 technologies).

<sup>23</sup> CPUC White Paper at 5.

<sup>24</sup> CPUC White Paper at 2.

<sup>25</sup> At [www.sandia.gov/ess/publications/SAND2013-5131.pdf](http://www.sandia.gov/ess/publications/SAND2013-5131.pdf). For additional useful tools, see the resources listed in Imre Gyuk, *Progress in Grid Energy Storage*, [www.sandia.gov/ess/publications/SAND2013-5131.pdf](http://www.sandia.gov/ess/publications/SAND2013-5131.pdf).

<sup>26</sup> Available through the CPUC website and at: [www.cpuc.ca.gov/NR/rdonlyres/A7FF0A4E-44FA-4281-8F8F-CFB773AC2181/0/DNVKEMA\\_EnergyStorageCostEffectiveness\\_Report.pdf](http://www.cpuc.ca.gov/NR/rdonlyres/A7FF0A4E-44FA-4281-8F8F-CFB773AC2181/0/DNVKEMA_EnergyStorageCostEffectiveness_Report.pdf) and [www.cpuc.ca.gov/NR/rdonlyres/1110403D-85B2-4FDB-B927-5F2EE9507FCA/0/Storage\\_CostEffectivenessReport\\_EPRI.pdf](http://www.cpuc.ca.gov/NR/rdonlyres/1110403D-85B2-4FDB-B927-5F2EE9507FCA/0/Storage_CostEffectivenessReport_EPRI.pdf).

<sup>27</sup> Order Adopting Amendments to §25.361 As Approved at the May 18, 2012 Meeting, Project 40150, PUC Rulemaking Proceeding Concerning An ERCOT Pilot Project (May 22, 2012), [www.puc.texas.gov/industry/projects/rules/40150/40150adt.pdf](http://www.puc.texas.gov/industry/projects/rules/40150/40150adt.pdf). *CostEffectivenessReport\_EPRI.pdf*.

<sup>28</sup> *Western Grid Dev., LLC*, 130 FERC ¶ 61,056 at PP 2, 4 (2010) (“Western Grid”).

<sup>29</sup> *Id.* at P 43.

<sup>30</sup> *Id.* at PP 19, 45-46.

<sup>31</sup> 16 U.S.C. § 824s.

<sup>32</sup> *Western Grid* at P 16. Significantly, however, FERC’s grant of the incentives was contingent on Western Grid’s project being approved by CAISO in its transmission planning process. In 2011, FERC denied Western Grid’s complaint against CAISO for failing to include the projects in the CAISO’s 2009-2010 transmission planning process. *Transmission Tech.*

*Solutions, LLC & Western Grid Dev., LLC v. Cal. Indep. Sys. Operator Corp.*, 135 FERC ¶ 61,077 (2011).

<sup>33</sup> *Western Grid* at P 44.

<sup>34</sup> *AES ES Westover, LLC*, Docket ER10-712-000, Application for Acceptance of Market-Based Rate Tariff and Granting of Waivers and Blanket Authorization, at 3 (filed Feb. 5, 2010).

<sup>35</sup> *AES ES Westover, LLC*, Docket Nos. ER10-712-000, et al. (unpublished delegated letter order issued Apr. 23, 2010).

<sup>36</sup> *AES EWG, supra*. Stephentown Spindle, LLC, Docket No. EG11-10-000, Notice of Self-Certification as an Exempt Wholesale Generator of Stephentown Spindle, LLC (filed Feb. 29, 2012).

<sup>37</sup> *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, Order No. 755, 137 FERC ¶ 61,064 (2011).

<sup>38</sup> Order No. 784 (revising 18 CFR Part 101, Uniform System of Accounts, Electric Plant Accounts, 348, 351, 363).

<sup>39</sup> Order No. 784 at PP 145-146, 178.

<sup>40</sup> Order No. 784 at PP 157-164.

<sup>41</sup> Cal. Pub. Utils. Comm’n, Resolution E-4522 (October 25, 2012) at 2-3. In the same order, the CPUC rejected three other projects, two (which also had storage) due to transmission concerns (unrelated to storage) and the other, which did not have storage, because it provided insufficient benefits to ratepayers.

<sup>42</sup> *Id.* at 3.

<sup>43</sup> Order Adopting Amendments to §25.192 and §25.501 As Approved at the November 10, 2011 Open Meeting, Project No. 39657, Rulemaking To Implement SB 943, Relating To Electric Energy Storage Equipment Or Facilities (undated), [www.puc.texas.gov/industry/projects/rules/39657/39657adt.pdf](http://www.puc.texas.gov/industry/projects/rules/39657/39657adt.pdf).

<sup>44</sup> DOE International Energy Storage Database (beta) at [www.energystorage-exchange.org/policies/search?search\\_search.x=0&policy\\_source\\_state=Texas](http://www.energystorage-exchange.org/policies/search?search_search.x=0&policy_source_state=Texas).

<sup>45</sup> Order Adopting Amendments to §25.192 and §25.501 As Approved at the March 7, 2012 Open Meeting, Project No. 39917, Rulemaking on Energy Storage Issues (March 29, 2012), [www.puc.texas.gov/industry/projects/rules/39917/39917adt.pdf](http://www.puc.texas.gov/industry/projects/rules/39917/39917adt.pdf). ■

## ENVIRONMENTAL AND ENERGY LAW PERSPECTIVES

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