FEATURE

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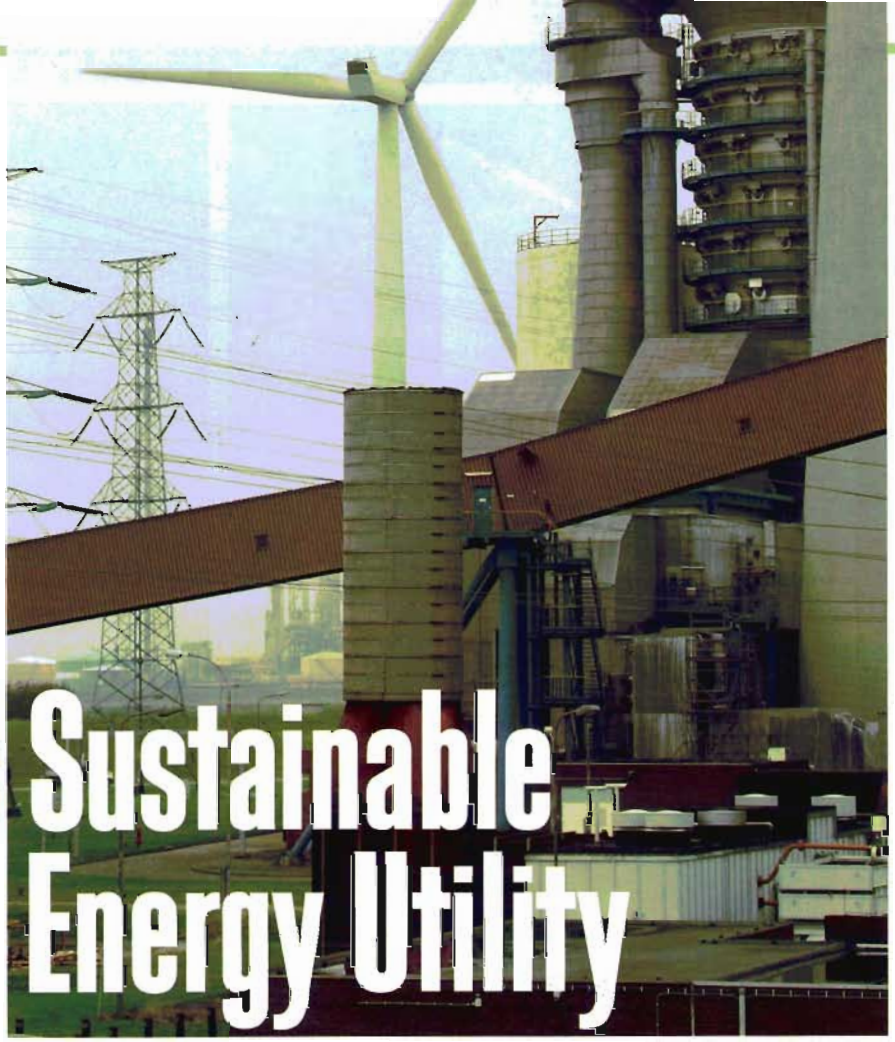

Delaware's Sustainable Energy Utility

The first-in-the-nation SEU offers a comprehensive approach to managing energy and the environment.

As each day dawns, the Earth performs a service essential to life itself — it recycles carbon. As a chemical element, carbon is released from many sources, including human activity. Our contributions are principally from the use of fossil fuels and changes in land use (such as road paving and the removal of forested areas for residential development).

The extent of carbon recycling by the biosphere is vast, far beyond anything human-made technology could accomplish. The planet's natural carbon cycle allows for gigatons of this gas to be released without harm. For humans, the earth's expectation is that each of us annually emits not more than 3.3 tons of carbon dioxide (CO_2 is the most common molecule in which carbon is found).

Most of Africa, Asia and Latin America have observed this budget. Europe has not — the continent releases more than 14 tons per person per year; Japan — our most efficient industrial economy — releases nearly 11 tons; and the U.S. overshoots its budget by more than any country on earth — we emit upwards of 21 tons of carbon dioxide per person per year, and our per capita amount is growing.[1]

The challenge of addressing the most global and complex threat to the life web could not occur at a more difficult time. With a worldwide recession that includes a staggering local manifestation — Delaware faces a deficit that is 20% of its state budget — it can be hard to muster the collective

will to tackle climate change. Yet, we must do so.

By mid-century, the best estimates of the Intergovernmental Panel on Climate Change are that we must cut worldwide CO_2 emissions by 60% to 80%.[2] Now, that is a budget crisis. Americans, in particular, must substantially reduce their emissions of this gas if humanity is to forestall the large and risky consequences of global warming. Without U.S. action, reductions by the rest of the human population cannot be sufficient to reverse the threat.

The problem seems so immense, one wonders what can be done.

Actually, we can meet the challenge, even in troubling economic times. We must dig ourselves out of the current economic mire, and the way forward is to rebuild our economy and way of life according to sustainability principles — we need to chart a course so that we live within a balanced budget of 3.3 tons of CO_2 per person per year. And, interestingly, Delaware is leading the way.

Once again we have the opportunity to make history as the First State. Through path-breaking legislation written by Senator Harris B. McDowell III, the "dean" of state energy policy, the General Assembly passed State Bill 18 creating the nation's first Sustainable Energy Utility (SEU).[3]

What is the SEU and what makes it so significant? Put simply, the SEU is a comprehensive model for tackling the energy and environmental challenges facing Delaware and the world. The energy utility of the 20th century was invented to rapidly and continuously increase energy supply. This utility served us well — it allowed economic growth at unparalleled rates in human history. But it also is the key contributor to the climate-change problem.

The 21st-century energy utility must have a different focus: to help every citizen and every business conserve energy and, when energy is needed, to utilize the energy gifts of our planet — sunlight, vegetation, the winds and the constant temperature of the earth's mantle just three meters below the surface. The SEU is the first effort at inventing the energy utility of the 21st century.

The benefits of the SEU are rapidly gaining attention. In testimony before Vice President Biden's Middle Class Task Force, John Podesta, President of the Center for American Progress,[4] cited the SEU as a showcase model to lead the country in achieving a clean energy economy and green workforce.[5]

In *Spectrum*, the international magazine of the Institute for Electrical and Electronic Engineers, Delaware's SEU is heralded as "perhaps the most comprehensive energy savings and distributed renewables program in the United States." [6]

And the April 2009 issue of the *Bulletin of Science, Technology and Society*, a scholarly journal, reports on applications of a Delaware-grown idea in Europe, Africa, Latin America and Asia, including a new initiative of the United Nations Environment Program (UNEP) to spread the concept throughout the world.[7]

Development of the SEU began in 2006, when Delaware's General Assembly created a bipartisan Sustainable Energy Task Force to research and recommend best-practice sustainable energy policies for the State. An impetus for the Task Force was the prospect of significant energy price increases looming on the horizon.

Price caps on electricity, which were established in 1999 as part of the state's electricity restructuring, were due to expire in 2007. Estimates forecast that residential electricity rates could rise by more than 50%.[8] Gasoline and natural gas prices were projected to spike at high levels as well, becoming unaffordable to many Delawareans.

With research support from the Center for Energy and Environmental Policy at the University of Delaware, the SEU architecture was designed and presented in the Task Force's final report. The report, *Sustainable Energy Utility: A Delaware First*,[9] outlined the key features of the SEU along with the Task Force's legislative recommendations.

The Delaware SEU has ambitious goals: a 30% reduction in energy consumption by 2015 for its participants, installation of 300 MW of customer-sited renewable energy for residences and businesses, average annual savings of $1,000 on energy bills for participating customers and a statewide reduction in CO_2 emissions that would return Delaware to 2003 levels by 2019. We would, in this way, begin the journey to reverse our carbon intensity.

The significance of the SEU is that it offers a structural reform of the energy sector along four dimensions: 1) a transition to carbon-free energy sources; 2) a reorientation from energy as a commodity to energy as a service; 3) the transition to a distributed energy infrastructure; and 4) the direct involvement of energy users in energy decisions.[10]

Most proposals for an energy transition are primarily based on the first two items, almost exclusively focusing on replacing fossil fuels with renewable energy and energy efficiency (albeit within the existing energy market and regulatory structure).

Facilitating a societal shift in technologies and fuels is certainly a critical step. However, the SEU goes much further. It provides the vehicle for reconfiguring the energy system from a centralized model with little opportunity for individuals to participate in energy decisions toward a community trust model in which individuals and communities become active participants in defining their energy futures.

Families and businesses are encouraged to "think about energy as a ...service, rather than a utility,"[11] and to design their own customized energy services ultimately contributing to a more

wide-ranging, varied and diverse energy infrastructure.

The Delaware SEU is a non-profit organization unaffiliated with the state's electric or gas utilities, but it works with them, the business sector, other non-profits and communities throughout the State to change the energy destiny of Delaware. Its mission is to design and deliver comprehensive end-user energy efficiency and customer-sited renewable energy services to Delaware's households and businesses.

As stated in the statute, Delaware "has an opportunity to create new markets for customer-sited renewable energy generation that will help build jobs in the State of Delaware, improve our national security, keep value within the local economy, improve energy reliability, and protect Delawareans from the damaging effects of recurrent energy price spikes." In this way, the legislation clearly and specifically ties energy reform to a new environmental, social, policy and economic future for the State.

As a non-profit agency, the SEU is governed by an Oversight Board and the Delaware Energy Office. The Oversight Board is intended to bring together a mix of public officials, energy experts and citizens with general oversight, evaluation and goal-setting responsibilities. Board members include the Secretary of the Department of Natural Resources and Environmental Control, the Delaware Public Advocate, seven members appointed by the Governor, and one appointee by both the President Pro Tempore of the Senate and the Speaker of the House of Representatives.

Through a competitive-bid process, the Oversight Board has selected an SEU Administrator with energy planning and management expertise for the day-to-day operations of this innovative utility. The Administrator Contract Team includes firms with extensive experience in energy conservation and renewable energy markets and technologies, green energy marketing,[12] sustainable energy financing and "clean cities" transportation planning.

This third-party management model relies on competitive contracting and performance incentives to meet the standards set forth by the Oversight Board. In this manner, the SEU is the point of contact for efficiency and self-generation in the same way that utilities are the point of contact for energy supply.

A critical element of the SEU is that individual energy users throughout the State can access energy services through a single organization that offers these services for the benefit of the energy user and the Delaware community. It combines Delaware's private and public

sector assets in an energy organizational structure that is publicly accountable, financially self-reproducing and entirely focused on energy and environmental sustainability.

The SEU expands upon other sustainable energy models, offering greater flexibility and the inclusion of all fuel types and income levels into the sustainable energy service stream. By law, the Delaware SEU is required to provide a comprehensive array of sustainable energy services which are customized to community and individual needs. This includes providing services at different decision points.

For example, some individuals may seek advice and assistance with appliance or equipment replacement, others may be interested in retrofitting existing buildings, and still others may be at the stage of new, "green" construction or looking for sustainable transportation opportunities.

The SEU coordinates the array of private and public services so that all needs and fuel uses can be made available. Policymakers and the Oversight Board establish high-level performance targets for the SEU; its contribution is that it has the flexibility to respond to customer needs and market changes to achieve these objectives.

The statewide shift to energy sustainability is further supported through a self-sustaining financing scheme. Two fundamental challenges that have plagued an energy transition are the upfront capital cost of sustainable energy measures and the longer-term goal of growing sustainable energy programs without significant energy price increases.

To tackle these problems, the SEU has the mandate to develop innovative approaches using third-party financing, federal incentives, program revenues, and leveraging sustainable energy funds available through other public sector and philanthropic sources. The SEU has the authority to issue tax-exempt bonds to contribute to the financing of its program activities, and is designated as the administrator of existing public-purpose energy funds and Regional Greenhouse Gas Initiative (RGGI) emissions auction proceeds.

The financing model allows the SEU to do two vital things for a 21st-century energy utility: 1) it has the capacity to secure sufficient capital to invest in the infrastructure of sustainable energy (rather than simply a suite of programs); and 2) it is capable of taking the "long view," rather than having to mostly produce short-term benefits. Its tools — tax-exempt bonds, revolving funds and cooperative investments — are the same ones the U.S. successfully used to build its public

schools, water facilities and other social infrastructure.

The SEU's unique legal construction creates a new foundation for the organization and delivery of energy as a community trust. Instead of the older model of billing for energy used and the associated plants and distribution network to deliver energy, the SEU invests in a future of lower and more efficient energy use. It pledges the capital necessary to allow Delawareans to choose energy conservation and efficiency as their first priority.

The energy cost savings created through community investments made by the SEU are then shared between the household, farm or business, on the one hand, and the SEU on the other. For example, when the home refrigerator fails, a household can choose between the *Energy Star*® model which uses 20% to 30% less energy and the less-efficient (and less-expensive) model.

In the past, the less-expensive model which uses more energy over its 15-year life, might be chosen over the "green" model. The SEU removes the advantage that inefficiency currently enjoys in the marketplace by covering the cost difference for the buyer. In return, the household sees its refrigerator-based energy costs decline, and a portion of those savings flow to the SEU to recover its investment. In this way, a revolving fund is created to serve the needs of future community members.

Similarly, the SEU stands ready to utilize community capital to provide rebates toward the purchase of a solar power system and recover costs from the sale of "Renewable Energy Credits" paid by the state's utilities to meet legal obligations for a percentage of their sales to be supplied by renewable energy.[13]

While low-income household energy burdens tend to be higher than their middle-income counterparts, they also tend to be an underserved population in energy programs. Federally funded low-income energy assistance and weatherization services can help, but these programs have historically been unable to meet existing demand. The SEU specifically addresses this problem through its Affordable Energy Services Program. Working with Delaware's well-performing Weatherization Assistance Program, the SEU is creating a partnership that will help the state to double its annual rate of weatherized homes.

The Center for Energy and Environmental Policy has estimated that efficiency and renewable energy investments through the SEU can reduce the state's carbon footprint by 33% by 2020. This achievement certainly places Delaware in a leadership role in the global effort to stabilize the climate. Just as importantly, the SEU is an essential tool for creating a green economy that prospers by investing in long-term sustainability.

Investment in conservation and renewables creates green jobs faster than any other option in the energy sector and is a key reason why we can address the economic and environmental crises together.[14] Additionally, the SEU establishes the legal and democratic space for an energy system that uses less, and when use is desired, supplies energy from renewable sources organized locally by and for the community.

An ongoing mutual promise of reciprocity and shared responsibility for investment and sharing of benefits opens the way for collective action for a healthy environment *and* a more democratically and socially governed energy system.[15]

Under the leadership of Governor Jack Markell, the State is now well positioned to use the SEU to its fullest. The Governor's "climate prosperity" agenda is helping the SEU to blossom as a tool in the efforts to battle significant economic problems for our families and communities by using SEU strategies to invest in a green economic future and workforce.

The path to such a future will not be easy and cannot happen overnight. But the vision and support of our elected and appointed officials is critical and Delaware, fortunately, now has the ability to lead.

Since its implementation in Delaware, the SEU is fast becoming the model for other jurisdictions. In July 2008, the City Council of the District of Columbia passed the Clean and Affordable Energy Act, empowering its Department of Environment to create an SEU for the comprehensive delivery of energy efficiency and customer-sited renewable energy services to residences and businesses in the nation's capital.

Philadelphia Mayor Michael Nutter has cited the SEU as "a great idea" that his city can utilize for "engaging in the needed changes at all levels of government" and in support of Green Jobs and an "Earth-friendly approach to sustainability."[16]

At its fall 2008 meeting, the National Council of State Legislatures passed a resolution seeking federal support for SEU-style financing.

And internationally, the Center for Energy and Environmental Policy was recently commissioned to undertake an SEU design study for Seoul in South Korea,[17] and the island nation of Bermuda has prepared a "Green Paper" recommending the adoption of an SEU.[18]

Clearly, there can be no single panacea for solving the global energy and environmental challenges that lie before us. However, the SEU and its community trust-green economy approach to engaging these problems offers a legal and policy framework from which democratic, citizen-based participation in the decisions regarding our energy and environmental futures can be made.

If successful, the SEU can contribute to a future when our grandchildren can enjoy playing under the sky without worrying about the carbon consequences. ◆

FOOTNOTES

1. The Center for Energy and Environmental Policy at the University of Delaware published the original calculations, based on 1990 world population levels, in a paper entitled "An Equity- and Sustainability-Based Policy Response to Global Climate Change" (1998) *Energy Policy*, Vol. 26, No. 4 (March): 335-43 (co-authored by John Byrne, Young-Doo Wang, Hoesung Lee and Jong-dall Kim). Updated estimates were published in a book chapter — John Byrne, Lado Kurdgelashvili and Kristen Hughes, "Undoing Atmospheric Harm: Civil Action to Shrink the Carbon Footprint." (2008), in *Urban Energy Transition: From Fossil Fuels to Renewable Power.* P. Droege ed. Oxford, UK: Elsevier. Pp. 27-54.

2. Intergovernmental Panel on Climate Change (IPCC) (2001), *Climate Change 2001: The Scientific Basis* (2001); and IPCC (2007), *Climate Change 2007: The Physical Science Basis — Summary for Policymakers* (2007). Available at http://www.ipcc.ch/ipcreports/assessments-reports.htm

3. Delaware State Senate 144th General Assembly Senate Substitute No.1 for Senate Bill No. 18. Available at http://www.seude.org/docs/legislation/DE_Senate_Bill_SS1toSB18_2007.pdf

4. Mr. Podesta was chief of staff for the Clinton Administration, and headed the transition team for President Barack Obama.

5. John Podesta, Testimony before Vice President Biden's Middle Class Task Force (February 27, 2009). Available at http://www.americanprogressaction.org/issues/2009/02/podesta_task_force.html

6. Susan A. Chang, "The Rise of the Energy Efficiency Utility," *IEEE Spectrum* (May 2008). Available at http://www.spectrum.ieee.org/may08/6216

7. *Bulletin of Science, Technology and Society* Volume 29 (2), including the paper by Dr. Lawrence Agbemabiese of UNEP. Available at http://bst.sagepub.com/content/vol29/issue2/

8. Cabinet Committee on Energy. "Ensuring Delaware's Energy Future: A response to Executive Order Number 82," Dover, DE (2006).

9. Sustainable Energy Utility Task Force. *The Sustainable Energy Utility: A Delaware First.* A report to the Delaware General Assembly.

10. Jason Houck & Wilson Rickerson. "The Sustainable Energy Utility Model for Energy Delivery." *Bulletin of Science, Technology and Society* Volume 29 (2), 95-107 (2009).

11. Catherine Mitchell. Renewable Energy: Step Change in Theory and Practice. *Proceedings of the Economic & Social Research Council Energy Research Conference*, London, UK (2003).

12. The Administrator team includes Cadmus Group, which serves the marketing arm of the U.S. Department of Energy and U.S. Environmental Protection Agency's jointly developed *Energy Star®* label.

13. The SEU can combine rebates from state funds with its own rebates or financing packages drawn from capital funds secured through bond sales and other methods in order to support renewable energy purchases. This approach increases the overall support of the renewable energy purchase. Renewable Energy Credits are bought and sold in markets by utilities in order to comply with state laws requiring fixed percentages of their sales to be supplied by renewable energy systems. The SEU has the authority to aggregate RECs on behalf of residents and businesses whose systems often generate small amounts of renewable electricity and, as a result, cannot attract high (or any) REC prices. Because participation in the SEU is voluntary, households and companies can choose to allow the SEU to aggregate their RECs or they can elect to sell them without the SEU's assistance.

14. Roger Bezdek. *Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century.* Boulder, Colorado: American Solar Energy Society (2007); Karen Ehrhardt-Martinez & John A. Laitner. *The Size of the U.S. Energy Efficiency Market: Generating a More Complete Picture.* Washington, D.C.: American Council for a Energy-Efficient Economy (2008).

15. John Byrne, Cecilia Martinez & Colin Rugerro. "Relocating Energy in the Social Commons: Ideas for a Sustainable Energy Utility." *Bulletin of Science, Technology and Society.* 29 (2), 81-94 (2009).

16. Jerry Rhodes. "Philadelphia Mayor Sees Hope for Urban America," *UDaily* (March 4, 2009). Available at http://www.seude.org/docs/2009_media_UDaily_Mayor%20Nutter_March%2012%20speech%20in%20honor%20of%20Louis%20Redding_highlighted.pdf

17. John Byrne, Lado Kurdgelashvili, Eric Partyka & Wilson Rickerson. *Sustainable Energy Utility Design: Options for the District of Columbia.* Newark, DE: Center for Energy and Environmental Policy (2008). Prepared for the District Department of Environment, Washington, DC. Available at http://ceep.udel.edu/energy/publications/2007_es_Wash%20DC_SEU_report_final.pdf

18. Government of Bermuda, *Energy Green Paper: A National Policy Consultation on Energy* (February 2009). Available at http://www.gov.bm/portal/erver.pt/gateway/PTARGS_0_2_12327_311_1794_43/http%3B/ptpublisher.gov.bm%3B7087/publishedcontent/publish/gov__top_level__org__house_/government_information/articles/bermuda_energy_green_paper__3mb__0.pdf