SEA SCIENTISTS & ENGINEERS FOR AMERICA

Chapter News

VOLUME 2, ISSUE 1 SPRING 2009

SEA's National Energy Campaign

Letter from the Executive Director

Welcome to the first chapter-produced SEA newsletter. The newsletter is a testament to what motivated people can do to change science policy even while they struggle with classes, lab work, jobs, and everything else that comes with being a student.

This edition focuses on energy. Inside, you'll find articles about students changing their campuses and their communities for the better—challenging the status quo to revamp buildings and behavior to save energy in new and creative ways. You'll also find articles about how to lead like-minded students to make a difference, including by attracting big-name speakers and growing SEA chapters.

A News from Washington feature helps you get a handle on energy legislation coming down the pike and identify the key players in the discussion. You can continue to track what Washington notables are doing on the SHARP Network, where each Senator and Representative has a page that outlines their votes and views on science policy.

Thanks to all of the students that contributed to the newsletter and as leaders on their campuses and in their communities. With this many talented individuals working toward the goal of evidence-based decision making, in energy policy and every policy, it's not a question of whether we'll be successful. It's only a question of when.

Sincerely,
Lesley Stone
Executive Director, SEA

IN THIS ISSUE:

Edited by:
Michele Kadnar
NYU chapter member
SEA virtual intern

A Scientist's Guide to the Stimulus Bill

On the day of the presidential inauguration, the ears of students, scientists, engineers and academics perked up in optimism at the President's vow to "restore science to its rightful place." Rhetoric may improve morale, but as every researcher or academic can attest, it is funding that keeps the doors open.

With the February 17 passage of the American Recovery and Reinvestment Act of 2009 (P.L. 111-5), the House and the Senate have joined Washington's new leadership to put money where their mouth is, so to speak.

Immediately after the bill's passage, the following words were issued in a statement from the office of House Speaker Nancy Pelosi:

"The conference report on American Recovery and Reinvestment Act will restore science and innovation as the keys to new American-made technology, preventing and treating diseases, and tackling urgent national challenges like climate change and dependence on foreign oil. The legislation contains targeted efforts in clean, efficient American energy; transforming our economy with science and technology [amongst others]."

What does this mean in real dollars, and how will they be spent? This article provides an overview of science-related stimulus funding, broken down by institution and industry.

* * *

The Final Document

After weeks of debate on their respective bills, the House and Senate negotiated their two stimulus bills to create, after much compromise, the American Recovery and Reinvestment Act of 2009.

In its final manifestation, the $789 billion stimulus package contains a total of $21.5 billion in federal research and development funding. This equates to more than proposed by either the House bill ($13.2 billion) or the Senate bill ($17.8 billion), with $18 billion alone for the conduct of research and development, and an additional $3.5 billion for research facilities and large research equipment.

There is additional money in the bill appropriated for science and technology related programs, higher education construction, and other education spending related to academia.

The American Recovery and Reinvestment Act was introduced in the House on January 26, 2009, passing the Senate three weeks later. On February 17, 2009, President Obama signed the act making it Public Law 111-5. *Photo by flickr user Cliff1066 (License: Creative Commons Attribution 2.0 Generic)*

Agency Awards

The biggest boost by far came to the National Institutes of Health, whose budget has been in decline since 2004. The $10.4 billion stimulus boost will bring the NIH total budget to nearly $40 billion. Although the House and Senate bills were divided on NSF funding, the National Science Foundation received the full award of $3 billion for basic research in fundamental science and engineering to spur discovery and innovation. This figure represents 80% of its 2008 budget.

The Department of Energy's energy program is the recipient of $3.5 billion that will prioritize activities in renewable energy, energy conservation and fossil energy.

NASA will receive $1 billion, emphasizing climate-change related satellite missions.

Other agencies, including the U.S. Geological Survey (USGS), NASA, the Centers for Disease Control and Prevention (CDC), and NOAA will receive funds for construction and maintenance that may be used to renovate existing laboratories or construct new ones.

Nearly all of the money is designated as FY 2009 money, with the intention of spending the money as quickly as possible to provide immediate economic stimulus. Some of the funding will go towards jumpstarting initiatives that may have been authorized years ago but never appropriated for want of funds. For example, $400 million of the stimulus will put ARPA-E (Advanced Research Projects Agency-Energy), which was approved in 2007, into business to pursue risky energy and climate related research.

The final stimulus bill will provide the first increase in funding that the federal research portfolio has seen in five years. Currently standing at $58.3 billion for FY 2009, the stimulus bill will boost this to nearly $75 billion. $3.5 billion was given for R&D facilities and capital equipment to help universities and federal labs address infrastructure needs, construct and renovate laboratories, and buy research equipment. This represents a dramatic increase (consider that the R&D facilities funding from 2008 was $4.5 B, and half of this went towards the International Space Station alone!)

Following years of declining budgets, things are looking optimistic for competitive research grant hopefuls- the final bill

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News from Washington

A Scientist's Guide to the Stimulus Bill (continued from page 2)

provisions a total of $1.4 billion, respectively partitioned into $1 billion, $200 million and $180 million parcels to NIH, NSF, and NIST for extramural competitively selected R&D facilities projects, nearly all at universities. Furthermore, NIH and NSF will each receive an additional $300 million for large research equipment needs in academia through competitive awards.

Agriculture and Water

The stimulus has awarded $26.4 billion to the U.S. Department of Agriculture, some of which is dedicated to watershed and flood prevention as well as repairs of agricultural research facilities.

This includes $2.5 billion to expand broadband service in rural America and an agricultural disaster transition program that could cost $800 million.

However, $20 billion of this will be spent on a temporary increase in public nutrition benefits, including among other things a 13% rise in food stamp benefits; $500 for the Women, Infants and Children nutrition program; $150 million for emergency food assistance; $100 million in grants for new food-service equipment for schools; $290 for a watershed and flood prevention program, half for buying and restoring floodplain easements. The watershed program also includes efforts to improve fish and wildlife habitat and create or restore wetlands with $50 million towards the NRCS's watershed rehabilitation program.

Water resources programs received funding through a variety of sources. The National Oceanic and Atmospheric Administration will receive $230 million for operations and facilities to address a backlog of research, restoration and conservation programs. The Army Corps of Engineers general fund will receive a boost of $4.6 billion, and the Corp's Mississippi River restoration project will see $375 million of this. $7 billion will go towards drinking water and wastewater projects, including $6 billion for the EPA clean water and drinking water state revolving fund, and $1.38 billion for USDA rural water and waste disposal program loans and grants.

Natural Resource Conservation

$3 billion of the bill's budget will fund agencies and programs that will directly impact natural resource conservation. Much of the funding is directed towards construction, repair, maintenance, or habitat restoration on federal public lands.

The U.S. Fish and Wildlife Service (FWS), the Bureau of Land Management (BLM), and the National Park Service (NPS) will receive respectively $115 million, $180 million and $589 million for construction, and $165 million, $125 million and $146 million for land-management programs.

A Capital Improvement and Maintenance fund for the U.S. Forest Service was granted $650 million. Both the BLM and USFS will get funding for wildland fire management, in the amounts of $15 and $500 million, respectively. For the USFS, half of this funding will be dedicated to hazardous fuel reduction, forest health protection, rehabilitation and hazard mitigation on federal lands, and the other towards cooperative efforts on state and private lands. The U.S. Forest Service recently identified at least $2.75 billion worth of hazardous fuel reduction projects appropriate for the stimulus program, and will seek to increase the stimulus funding over a two-year period.

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What's next?

According to Steve Girvin, Yale University's deputy provost for science and technology, broad-based funding like that of the stimulus bill is particularly important given the hit-or-miss nature of science.

"The interesting thing about scientific research is that you can never tell where it's going to go", he said. "Ninety-nine percent of it is a complete waste of time, but you can never tell what ninety-nine percent, and the one percent that does succeed changes our lives."

Monitor the spending of the American Recovery and Reinvestment Act funds at www.recovery.gov

While stimulus money will build infrastructure and support R&D, it does not directly fund scientists and engineers in labs, or postdoc and graduate students in universities. These funds come from the annual budget. While Obama has promised to double funding for the physical sciences in 10 years, it will be everyone's responsibility to pressure Congress to keep science funding as a priority beyond what this stimulus boost will provide.

For a complete breakdown of funds by institution, visit http://www.aaas.org/spp/rd/stim09c.pdf.

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To see the final text of the American Recovery and Reinvestment Act, as the President signed it, visit: www.whitehouse.gov/the_press_office/ARRA_public_review/

News from Washington

Energy Legislation Hearings

March kicked off a series of hearings in both the Senate Energy and Natural Resources Committee and the House Energy and Commerce Subcommittee on Energy and Environment that are expected to culminate in major energy legislation.

The Senate hearings are on an energy bill introduced this session by Senator Harry Reid (D-NV) as well as on a bill introduced by Senators Bingaman (D-NV) and Murkowski (R-AK). The House Energy and Commerce Subcommittee is currently focused on climate change.

The Senate Energy and Natural Resources Committee is expected to mark-up a significant energy bill this Spring. House hearings are also anticipated to result in major energy legislation mark-ups. It has been said that the House will include climate change legislation as part of a broader energy plan.

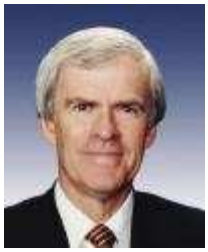
Here are some key energy leaders, and highlights from their proposed legislation, to watch during this Congressional session. It is possible that many of these bills will become part of a larger piece of legislation.

Harry Reid (D-NV), Senate Majority Leader, introduced one of this session's first major pieces of energy legislation, the Clean Renewable Energy and Economic Development Act (S.539). This bill would help

Sen. Harry Reid

create an "electric highway," by allowing the federal government to build power lines that would connect wind, solar, and geothermal power plants to the national grid. This would allow for the transportation of these renewable energies to our national power supply.

Senate Democrats support a requirement for utilities to obtain a specific amount of their electricity from renewable sources. Currently, the federal government has no mandatory renewable energy programs. Some states have such programs in place, such as giving customers the option of purchasing their energy from renewable sources. Senator Reid's home state, Nevada, has heavy investment in renewable energy projects.



Sen. Jeff Bingaman

Jeff Bingaman (D-NV), chairman of the Senate Committee on Energy and Natural Resources, has introduced a bill with Senator Murkowski (called the Energy and Water Integration Act, S.531) to support research into how to use water in energy production. Although water is often used to produce energy at power plants, there has never been a piece of legislation that has integrated both water and energy.

Sen. Lisa Murkowski

Lisa Murkowski (R-AK), ranking-member of the Senate Committee on Energy and Natural Resources, introduced the Energy and Water Integration Act with Senator Bingaman.

Both Senator Murkowski and Bingaman support implementing renewable-electricity standards. However, Murkowski supports the use of nuclear power, while Bingaman does not.

Rep. Henry Waxman

Henry A. Waxman (D-CA-30) is chairman of the House Energy and Commerce Committee. Representative Waxman is working to mark up a bill that would cap greenhouse gas emissions. Waxman hopes to have his climate change legislation out of committee by Memorial Day.

Representative Waxman's home state of California also has renewable energy standards. California has passed legislation that 20% of energy used in the state must be generated from renewable resources by 2010.

Rep. Ed Perlmutter

Ed Perlmutter (D-CO-7), is a member of the House Committee on Financial Services. Representative Perlmutter sponsored a bill, The GREEN Act of 2008, that did not make it out of committee in the 110th Congress. This bill would encourage energy efficiency and conservation, development of renewable energy sources for housing, commercial structures, and other buildings, as well as the creation of sustainable communities. There is some talk that the House Committee on Financial Services will move The GREEN Act through again.

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For more information on members of the House and Senate Energy Committees visit: SHARP.SEforA.org

Bigger, Better, SMARTER

On February 17, 2009, at the foothills of the Rocky Mountains, President Obama signed the much-debated $787 billion stimulus bill into law. Officially designated the "American Recovery and Reinvestment Act" (H.R. 1), the legislation devotes an unprecedented amount of federal funds to issues as diverse as education, infrastructure, and healthcare—all in an effort to stem job loss and restore the economy to its pre-credit-default-swap heyday.

The setting of Obama's announcement was apropos, not only because Denver was where Obama was chosen as the Democratic Party's nominee less than six months earlier, but also because neighboring Boulder is slated to become the first U.S. city to fully embrace the very technology $11 billion of the stimulus supports: the Smart Grid.

A precise definition of the Smart Grid is nebulous at best, despite the ease with which this new catchphrase of the energy (and now political) world rolls off the tongue. Rather than a single, discrete technology, the Smart Grid is a gestalt concept, an ideal end product of sundry elements that will work together to increase energy efficiency, allow for alternative energy inputs, and reduce the likelihood of power failures. The core idea behind the I.Q. boost is to infuse the present electrical system—our network of power generators and transmission lines that deliver electricity to our homes and offices—with a better monitoring system, and critically, allow for two-way communication and energy flow between power producers and consumers.

It almost seems absurd that something as simple as improved monitoring could result in a complete paradigm shift in how Americans use electricity, from booting up computers and flicking on TVs to nuking macaroni and cheese. But to grid operators, knowing the supply and demand of electricity at any given location in real time is the stuff dreams are made of. This is because electricity cannot yet be stored; it must be used as soon as it is produced, requiring a delicate balance of the flow of electrons being generated in plants (moving at nearly the speed of light) with the demand from consumers.

In periods of high demand, or peak use, the system is the most likely to fail; so to keep the lights on, utilities draw on backup power generators, or "peaker plants." According to the Department of Energy (DOE), even though a power outage can be averted 99.97% of the time, these plants are inefficient and expensive to maintain. Smart Grid technologies such as syncrophasors, or phasor measurement units, offer an opportunity to improve the success rate of the balancing act without having to resort to peaker plants. The devices are synchronized with one another via GPS, and measure voltage 30 times a second (conventional analog and digital units max out at six), giving operators an unprecedented level of resolution of electrical activity across the grid. Coupled with new tools to integrate this increase in data, as well as faster processors capable of executing protective programs in a fraction of a second, the system will have greater control when the electron stream goes awry. Ultimately, a truly Smart Grid will be able to manage itself, capable of "self-healing."

The "electric grid" is the network of power lines that transmit energy from the point of generation to the consumer. The United States is supported by three main power grids: the Eastern, Western and Texas Interconnected Systems.
Photo by flickr user HÂkan Dahlstr^m. (License: Creative Commons Attribution-Noncommercial-No Derivative Works 2.0 Generic)

"Smart Grid" refers to the use of technology to efficiently transmit and deliver electricity to homes and businesses saving money and energy.

Since energy used at peak times is more expensive, another way to increase efficiency via measurement improvements is to give control to the consumer. This is where Smart Grid "enabling" technologies, such as smart meters and appliances, come into play. Unlike traditional meters, smart meters are able to record energy usage in conjunction with time, allowing households to become aware of their consumption and ways to reduce it. For example, consumers motivated by a discount could do laundry at an off-peak time and reduce the burden on the grid. Similarly, appliances equipped to sense fluctuations in electricity during peak use can momentarily shut down their most energy-expensive operations. The Pacific Northwest National Laboratory, which has performed pilot tests of these brainy appliances, explains, "Multiplied on a large scale, this instant reduction in energy load could serve as a shock absorber for the grid."

One of the most important implications of improved measurement and monitoring is the opportunity to integrate the highly

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News from Washington

Bigger, Better, SMARTER

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green but notoriously unreliable renewable energy sources of solar and wind. In fact, it is clear that a Smart Grid—or at least significantly smarter grid—is necessary (but not sufficient) to see clean energy sources become a reality. An important consideration for many of these green inputs is the distance of the generators from the consumers, since energy is lost during transmission and new lines are expensive to build. While large-scale solar projects may only be feasible in the desert, it's relatively easy to imagine a few solar panels placed on houses and offices across a large metropolis. Such distributed generation is highly beneficial because it decentralizes the grid; as in any small-world network, this makes the entire system more robust.

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While few energy experts disagree over whether the Smart Grid is necessary, it's unclear where the money will come from to support such a massive project. One Electric Power Research Institute report estimated that development of the Smart Grid would take 10 years at an annual cost of $13 billion. This is a considerable sum, but Smart Grid proponents emphasize it is a mere fraction of the yearly loss due to blackouts. The American Recovery and Reinvestment Act (ARRA), which allots $11 billion to a "bigger, better, smarter electrical grid," is a start.

The stimulus involves modernizing or creating 3,000 miles of transmission lines (approximately 1% of existing lines) and installing 40 million new smart meters by the end of 2011. Additional funds, for a total of nearly $100 billion, are devoted to clean energy projects via the nascent Clean Energy Finance Authority, with the aim of doubling our renewable energy capacity in three years. Many of these investments, like $2 billion to the Advanced Battery Grants Program, are likely to interface with the grid.

The stimulus builds on the Energy Policy Act of 2005's renewable energy and electric power transmission loan guarantee program to include up to $500 million for relevant projects that can be "rapidly deployed." Similarly, the ARRA expands the funding for Smart Grid demonstration projects first provided for by Title XIII of the Energy Independence and Security Act of 2007, which created the Smart Grid Advisory Committee and the Task Force responsible for directing such research. The federal government will now match up to 50% of Smart Grid investments instead of just 20%.

Deploying the Smart Grid—like Eisenhower's Highway System or the Internet, two governmental projects that took 20-30 years to come to full fruition—will undoubtedly be a long-term project. But just as our current electrical grid was declared by the National Academy of Engineering as the "most significant engineering achievement of the 20th century," it's quite possible the Smart Grid will capture the prize for the 21st.

DID YOU KNOW?

EARTH HOUR

is 8:30- 9:30 pm, local time, on Saturday March 28. Turn off your lights to "vote Earth" in the world's first global election between Earth and global warming. For more information, visit: www.earthhour.org

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Electricity Infrastructure Operations Center. "Bringing Power to the People." Pacific Northwest National Laboratory. http://eioc.pnl.gov/research/gridwise.stm.

DOE's Office of Electricity Delivery and Energy Reliability. 2008. *The Smart Grid: An Introduction*. http://www.oe.energy.gov. Full .pdf available online.

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Smart Grid Technology Will be a Boost to Other Green Industries

Another burgeoning green industry, that of plug-in hybrid electric vehicles (PHEVs), is contingent on the development of a Smart Grid. But the reverse may also be true; PHEVs would serve as little mobile batteries that could give back to the grid when not in use. This symbiotic relationship might be the very solution Americans have been looking for in order to escape the clutches of foreign oil. Indeed, the Pacific Northwest National Laboratory estimates oil imports could be reduced by 52% if less than three-quarters of U.S. cars and trucks were replaced with PHEVs. Such a move would give Mother Earth a hug, too. A 2007 joint study by the Electric Power Research Institute (EPRI) and the Natural Resources Defense Council found that a similar exchange by 2050 would slash greenhouse gas emissions by 450 million metric tons. The prospect is tantalizing, and underscores the Smart Grid's potential to go beyond sheer voltage. Nevertheless, it remains a risky venture, dependent on international politics and the price of oil, improvements to battery technology and economics, as well as the receptivity of the average American driver to forsake the beloved internal combustion engine. Even though the DOE calculates PHEVs would be far more affordable for drivers—an equivalent of just 90 cents per gallon—EPRI estimates they won't become a substantial part of the grid until 2030. Sources: "Environmental Assessment of Plug-In Hybrid Electric Vehicles."Electric Power Research Institute. http://my.epri.com/. Full study available. —Jessica McDonald

News You Can Use

Does Your School Make the Sustainable Grade?

On every campus in the country, something "green" is going on. From food recycling to paper conservation to compact fluorescent bulbs in the dorms, schools nationwide are implementing programs to make their campuses more sustainable. Is it really making a difference? Is your school really doing . . . anything?

The people at GreenReportCard.org have graded 300 major universities in all 50 states in nine key areas of sustainability. While you may throw your soda can in the recycling bin every day at lunch, is your school as a whole doing all it can to set an example? By taking a look at how your particular school measures up in each category below, you can highlight both where your campus excels and where it could improve. Or, if your school did not make the list, use these categories as a guidelines to score your school as an energy project.

Administration. Schools that score well here have made commitments in the master plan or mission statement and formed agreements with the community to create a sustainable campus. One important finding shows that over half of schools that score well here have full-time staff dedicated to sustainability, and that this is a major predictor of success.

Other important criteria are green purchasing policies, sustainable advisory committees, and membership in national networks promoting green growth.

Climate Change & Energy. Most schools have enormous energy demands. This category grades a campus on its policies not only to provide clean energy, but to reduce the overall demand for energy on campus. Successful programs include commissioning carbon impact studies, purchasing or producing renewable energy or initiating programs to retrofit buildings with more energy-efficient materials.

Food & Recycling. Some campuses feed tens of thousands of people a day. Implementing eco-friendly food practices is a huge step toward creating a sustainable campus environment. One of the most important things that campuses can do is buy food from local sources, reducing the carbon emissions associated with transportation. Other campuses that grade well here have begun to compost food waste and provide biodegradable food containers and utensils. Overall, most colleges and universities grade well in this category.

Green Building. It's the goal of almost every campus to continue on a path of growth and expansion. Whether it is construction of new research laboratories, expanding student housing or upgrading campus utilities, building projects are a constant fixture on many campuses. To score well here, universities must commit to a plan for new construction projects, and must also integrate green building practices into retrofits and upgrades of existing buildings. Campuses can even seek federal certification of green building policies through the Leadership in Energy and Environmental Design (LEED) program. While most campuses have adopted some parts of green building policies, it is important to make sure "green" becomes the primary priority in all new projects.

Student Involvement. It should be obvious that student involvement is one of the most effective driving forces behind sustainable policies on college campuses.

Students are the largest population group and when motivated and organized, they can be the most influential voices at their school. Campuses are graded on how involved students are in sustainability efforts and how much support students receive from the administration.

Some schools have even begun educating students in sustainable living as part of their freshman orientation. Some schools (continued on page 8)

Sustainability

Defined in 1987 at the World Commission on Environment and Development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs

LEED Certification

The US Green Building Council is a non-profit group that certifies buildings as having Leadership in Energy and Environmental Design (LEED) standards based on a four-tiered point system. Buildings receive points for water efficiency, access to transportation, restoration of open space, on-site renewable energy, innovation, design and air quality and temperature, among other areas. Visit the US Green Building Council's website for more information on LEED: www.usgbc.org/

News You Can Use

Does Your School Make the Sustainable Grade?

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with the highest grades given by Green Report Card even provide paid positions for students as part of university sustainability efforts.

Transportation. College campuses are diverse in locations, vicinity to metropolitan areas, and the size of the student body. All of these factors contribute to a campus' transportation philosophy.

Schools are graded on efforts to promote pedestrian and bike-friendly areas, to provide shared and public transportation options, and to operate hybrid and clean-fuel vehicles as part of the campus fleet.

Often, when people are exposed to green transportation programs through work or school, they will implement these habits at home and demand them in their community. See if your campus provides car-share programs or discounted public transportation for commuting students.

Visit
www.greenreportcard.org
to find your school's grade
and for more information on the practices of well-scoring schools.

Endowment Transparency, Investment Priorities, Shareholder Engagement. While maybe not as familiar as other categories, these three are extremely important aspects of an overall policy of sustainability at colleges and universities.

At some level, all colleges and universities must answer to shareholders or the public as well as manage the investment of their endowments. While not apparent to many students, these aspects hold great influence over all other categories.

Ask these questions of your administration: How well do they communicate their investment priorities to the students, staff and the public and how do they go about setting these priorities? Are the investments that make up your university's endowment freely disclosed and available for review? Do they engage the student body for input into future investment decisions? Are citizens of the community and the university population involved in investment decisions?

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Clearly, creating a green campus has many facets. These different categories provide opportunities for students to identify areas where their school can improve and what student groups can do to bring about these changes.

At the end of the day, grades are a big part of what going to college is about. Only when we take a long, hard look at how our campuses interact with the world around us can we begin to see how we might change them for the better.

Joseph Hanson (hanson.joe@gmail.com) is co-Founder of the University of Texas's (Austin) SEA Chapter.

DID YOU KNOW?

ENERGY STAR is as a joint effort of the U.S. Environmental Protection Agency and the U.S. Department of Energy. This voluntary labeling program is designed to identify and promote energy-efficient products to reduce green house gas emissions. The ENERGY STAR label can be found on major appliances, office equipment, lighting, home electronics and home construction materials, such as energy-efficient windows. Customers who choose ENERGY STAR products can receive rebates and other incentives from the government.

Visit www.energystar.gov to find out more.

www.energystar.gov

Interested in a science policy career?
Visit: SHARP.SEforA.org/internships
for internship, fellowship, and job opportunities in science policy

Giving Power to the People

By measuring energy consumption in real-time, smart meters, which replace the standard electric meter currently in most homes, offer consumers the chance to become active players in the electricity chain.

Although the Energy Policy Act began requiring utilities to provide smart metering services to customers upon request back in 2005, the smart meter boom has yet to materialize. Even smart meters don't create interactivity on their own; most report back to the utilities, and customers never know the impact of the decision to do the laundry at 3 A.M. versus noon the next day—or how much energy (and money) could be saved simply by air-drying the clothes.

With both energy demand and concern over the environment rising, giving power to the people—over their own power—is a logical next step to reduce consumption and revitalize the role of the individual in the increasingly complex network of society and its energy source, the electrical grid.

Google is one of several companies to recognize that the potential of supplying the consumer with usage information goes beyond sheer voltage.

Roughly a week prior to Obama's stimulus announcement, which intends to put 40 million new smart meters in American homes over the next three years, Google.org presciently unveiled a prototype version of their smart meter software program, PowerMeter.

Smart Meters allow users to monitor their energy usage in real time, to donate renewable energy back to the grid, boosting the nation's supply, and to manage the power sent to appliances. *Photo by Tom Raftery. (License: Creative Commons Attribution-Non commercial-Share Alike 2.0 Generic)*

With typical geek panache, Google succinctly describes the strategy of PowerMeter—and by extension, the entire Smart Grid enterprise—by borrowing a line from Lord Kelvin: "If you cannot measure it, you cannot improve it." And, as if channeling President Obama, a promotional video for PowerMeter changes the applicable aphorism to "You CAN measure it. You CAN improve it."

The program delivers meter information directly to a user's iGoogle homepage, making energy consumption as conspicuous as e-mail, news headlines, or word- and quotes-of-the-day.

PowerMeter is still in private beta, but the Google employees who tested the tool were able to save energy—and considerable sums of money—by making relatively minor changes to their behavior or homes, such as replacing traditional light bulbs with compact fluorescent bulbs.

Google estimates that each home outfitted with a smart meter and access to an easy-to-use interface to respond to such data will save 5-15% of its monthly electric bill. Multiplied over many homes, the impact is substantial.

PowerMeter is expected to roll out in pilot programs over the next several months and will be a free service to both utilities and users.

Until PowerMeter is released to the wider public, Google must coordinate with utilities (typically the owners of the meters), governmental regulators, and the meter makers themselves. And while Google is clearly invested in the development of PowerMeter, the accompanying website proclaims, "empowering consumers with energy information is too important to rely on just one provider, and we welcome and encourage other approaches."

Cited Sources:

Google Energy Information. "If you Cannot Measure It, You Cannot Improve It." Google. http://www.google.org/powermeter/

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Google's PowerMeter is currently being beta tested.
Join the Google Group
"Google Energy Information News and Updates"
to stay abreast of PowerMeter updates.
More information is available at
www.google.org/powermeter/

To learn more about energy policy issues visit:
SHARP.SEforA.org/issues/

Chapter Projects

Longhorns Compete on Energy Conservation

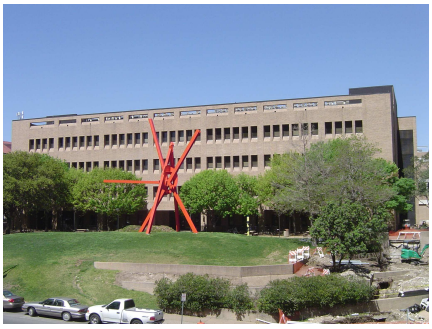
Ever wonder what you can do to help conserve energy on your college campus?

The University of Texas at Austin Chapter of SEA is trying to answer that question. According to UT's Utilities and Energy Management office, the campus is expected to consume over 86 million Kwh of electricity during the 2008-2009 academic year, which amounts to a total cost of more than $6.4 million. In the face of rising financial and environmental costs, students on the UT campus have initiated numerous energy conservation projects.

Following the lead of students at the University of California – Berkeley, students at UT-Austin have implemented conservation efforts in residence halls resulting in 8-11% reductions in energy usage in these buildings. As impressive as these results are, residence halls make up only 9.1% of assignable square footage on campus. Classrooms and offices account for 26.4% of campus. The rest of the buildings are classified as being for research, health, support, study or general use.

The UT Chapter of SEA seeks to reduce energy consumption in classroom and office-use designated buildings, a significant portion of campus space, by engaging the occupants of these buildings.

Although the future of energy conservation will be based on highly efficient supply-side conservation initiatives, the SEA members believe they can have an immediate impact on electricity usage by addressing demand-side energy management issues. The newly formed chapter will implement the Competitive Energy Reduction (CER) project on their campus this spring.



This April, UT-Austin SEA chapter members will compete to reduce energy usage in two campus buildings, the Chemical and Petroleum Engineering Building (left) and the Sarah M. & Charles E. Seay Psychology Building (right), conserving a portion of the 86 million kilowatt hours used during the '08-'09 academic year. *Photos by Jamie Vernon.*

What is the Competitive Energy Reduction project?

The CER project is an intra-organizational competition in which chapter members form two teams that compete to reduce energy consumption in select buildings on campus. Each team will be assigned a building where they will carry out a month-long education campaign designed to reduce energy usage behaviors. It will be up to the creativity of the teams to decide what the best methods for reducing energy consumption are.

In partnership with Al Lewandowski, manager of Demand-side Energy Management and Conservation (DSEMC) for UT Facilities Services, the chapter members will collect data from meter boxes that monitor the energy usage for their assigned buildings. As the project progresses, the teams will be able to observe the effects of their efforts and will adjust their programs accordingly.

Data collection will begin on April 1, 2009, and will continue through the end of the month. The results will be compared and the winning team will be recognized for having the greatest impact on the energy consumption habits of the occupants of their building.

So, what techniques will be used to encourage building occupants to reduce energy usage?

Team members will build an effective campaign that will invigorate and motivate building occupants to save energy.

Members will sponsor meetings, post signs, email reminders, perform surveys and engage building occupants in ways that encourage them to participate in the energy conservation effort. For instance, by simply focusing on turning off lights and regulating computer usage, the teams can offer suggestions that make a real difference in energy consumption on campus.

Teams will monitor their progress using a website that provides real-time analysis of the project. Building occupants will also have access to the website so that they can visualize the impact of their behavioral changes. By providing instant feedback, the website will increase enthusiasm for the project.

What does the chapter expect from this project?

The outcome of a CER-type project is dependent upon the involvement of the building occupants in the project and the effectiveness of the energy conservation campaigns developed by the SEA teams.

The chapter expects building occupants who participate in meetings, respond to surveys, and read emails will actively reduce their energy consumption. This will have an impact on overall

(continued on page 11)

Improving Schools

Stopping Light Pollution and Energy Waste in Buffalo Schools

Have you ever thought about how much money is spent on energy for your campus? If you take a look around, you may see ceiling lights and exit lights. Does your school make use of skylights, or natural lighting?

For the schools in the suburbs of Buffalo, New York a couple of years ago, the answer to those questions was "no." One could drive past any of the local suburban schools at night and see an aura of lights. Stadium lights, parking lot lights, and lights inside of the school would have been on, and visible for miles away. Not only were the schools wasting energy, but they were contributing to light pollution, a term that the International Dark-Sky Association uses to describe the adverse effects of artificial light such as glare, decreased visibility at night, and energy waste.

Lighting expenses contributed to a large proportion of the over $10,000 spent by each school per month on energy costs, breaking the school district budget. A quick solution was needed, or else there would be a negative financial effect on the community. The answer to the problem was simple: find ways to conserve energy.

In a race to save on the schools' energy expenses and to significantly decrease the amount of light pollution in the area, I gathered and led a committee of adults and teens that reached out to the community for donations by giving lectures and having dozens of teen talk sessions about the importance of conserving energy and saving the environment from light pollution. Our efforts helped raise awareness about the lighting issue, and generous funding flowed in to support our cause.

Over the span of six months, the committee collected a substantial amount of money to upgrade heating, cooling, and lighting for all eleven schools in the area. With the help of a philanthropic electrical repair company, and many hands of volunteer plumbers, the pipes and ducts for heating, cooling, and water were all insulated. Timers and dimmers were installed for every light in each building, as well as every heater. Skylights, solar panels, and wind turbines were installed on the roofs.

Buffalo-area schools were spending large sums of money to light unused school rooms at night.
Photo by flickr user arlost62. (License: Creative Commons Attribution - Noncommercial 2.0 Generic)

As a result, energy costs were chopped in half, which saved the community handfuls of money. Our project was a huge success.

This project can be done by anyone as long as they have a plan. It's certainly not a one man job, so make sure you have a team of people behind you that will genuinely help the cause. Other than that, the sky is the limit!

Raven Baxter is a SEA virtual intern.

Longhorns Compete on Energy Conservation (continued from page 10)

energy usage within the buildings. They hope to provide valuable methods for influencing the behaviors of building occupants on the UT-Austin campus.

On a broader scale, the chapter will seek to incorporate these newly devised techniques into the university's energy conservation policy.

Why is the CER project a good idea for you and your college campus?

In addition to saving energy, which is good for the environment, this project will also result in monetary savings for your university. In 2006, rising energy costs were used to justify tuition increases at the University of Texas at Austin. Since that time, energy prices have continued to rise.

By simply applying the recommended computer configurations, UT could save as much as $40 annually per computer from the university's computer power bills. With an estimated 40,000 computers on campus, that translates to about $1,600,000 a year. That amount of money could be used to offset any impending tuition hikes on your campus.

Jamie Vernon (vernonjl@gmail.com) is co-Founder of the University of Texas's (Austin) SEA Chapter.

Chapter Resources

Attracting High-Profile Speakers

One way to elevate the status of a chapter on-campus and to attract more members is to organize events with high-profile speakers.

At our Northwestern-Evanston chapter, we organized and held one of the only debates on science policy that took place during the 2008 Presidential election between official representatives of the Obama and McCain campaigns. We have another event occurring at the end of March featuring representatives from academia and the National Labs discussing the role science funding plays in stimulating the economy. We have also lined up Congressman Bill Foster (D-IL) to speak in May on how he transitioned from a career in science to a career in government.

I hope that by sharing our strategies we can assist other chapters in planning events that increase the enthusiasm for and awareness of critical issues related to science and policy on your campus.

Leverage your local resources. Each chapter is located at a university awash in resources, both intellectual and otherwise. Take advantage of your university's strengths, even if it means straying out of your usual academic circles.

When putting together the panel to discuss science's role in the economic stimulus plan, we found a number of professors at Northwestern's renowned business school who were enthusiastic about discussing the subject.

Using your local resources means moving beyond your university as well. In our case, we have the city of Chicago and it surrounding suburbs to draw from allowing us to look at other nearby universities for speakers, as well as pulling people from Chicago's industry and the national labs (Argonne and Fermi) that are nearby. The impetus for our Election 2008 event was learning that one of Obama's five science advisors was Donald Lamb, a professor at the University of Chicago.

Finally, consider your elected representatives as part of your local resources. Learn about their backgrounds, what committees they serve on, and where they stand politically.

We were excited when Bill Foster was elected to represent Illinois' 14th Congressional district because of his background as a professional scientist. Even though he does not represent our university's district, we were able to convince him to come speak here because he is passionate about involving more scientists in science policy.

Consider your elected representatives as a local resource.

See your position as students as an advantage. It can be easy to feel intimidated when approaching people who have local or national fame. But it is important to remember that you can use your position as a student as an asset. Don Lamb informed me that the reason he agreed to participate in our science policy debate (just a few weeks before the national election at a time he was extremely busy) was because we were a student-run and organized group. He, like many other people, was heartened to hear from student-scientists who are interested in social and political engagement.

This May, Northwestern-Evanston is hosting Representative Bill Foster (D-IL) (above), who will speak about his transition from a career in physics to a career in government.

Be persistent. Our experience, and common-sense both suggest that there will always be pitfalls.

It pays to be persistent. In the case of our science-policy debate, it was difficult for us to find a qualified speaker from the McCain campaign, due to the fact that Illinois is heavily Democratic. It took many calls to a large number of Republican officials at John McCain's Presidential campaign and the local Republican National Committees before we were able to secure a speaker.

But in the end, we were able to get a PhD candidate in Chemistry who was advising the McCain campaign in Illinois to attend the debate. Her presence made the event far more balanced and interesting than a presentation from Obama's science advisor alone.

There is a balance between being persistent and overly demanding, but so long as you maintain a professional and courteous demeanor, most people won't mind a follow-up call or a reminder that you still need their help for your upcoming event.

Be timely. One key to being able to find good speakers is having an event which speaks to the most important issues of the day.

In our case, this meant seeing that the current economic crisis superseded some of our earlier plans. By responding to the situation at hand, we found many excellent speakers who wanted to speak to the issue we brought to them, namely what science and technology's role would be in the stimulus package, and what its role will be in creating an economic recovery.

While it is true that there are times to get people talking about issues that are not on the front page of newspapers across the country on a daily basis, you shouldn't be afraid to adapt your chapter's priorities to crisis-level issues as they come up. It will make your group's message seem timely and relevant to your members and will help draw new members in.

Joshua Kellar (j-kellar@northwestern.edu) is co-President of Northwestern University's (Evanston) SEA Chapter.

Chapter Resources

Recruiting Beyond Your Chapter

As members of SEA, it is our responsibility as upholders of the ideals embodied by our mission to recruit our colleagues in the sciences to join us in taking up the charge.

It starts with a simple question: "Are you interested in science policy?" If you get even a slight inkling of interest showing, you have your 'in.' No catch phrases. No scripts. Just talk about your mutual interest in science policy (and policy for science).

Since we're so early in the game, the number of chapters we can start around the country is almost as important as the quality of each individual chapter, so here are some places to start:

Poster sessions. We know how these go: stand in the same spot for two-to-five hours and hope (or maybe not) someone asks you about your research.

Unfortunately the bigger or broader the meeting, the more likely you are to spend most of your time just standing there.

So introduce yourself to your neighbor. They're not going anywhere either, and chances are they'll welcome the opportunity to talk to someone. Just make sure to pause the conversation if anyone with a clipboard and a nametag that says, 'Judge,' walks up.

STAY CONNECTED:
Join SEA's Facebook Group, Subscribe to SEA's YouTube Channel

Conferences and Meetings. This is everything outside of the poster session. Before a talk starts, or as one is letting out, chat up your neighbor and slip them our web address, www.SHARP.SEforA.org or a chapter business card (see below).

Connecting online. Some experts are saying that social networking sites may make even e-mail obsolete (sounds preposterous, but I'm sure someone felt the same way about the telegram). Do you have any friends whose networks say "<school> Grad Student?" Invite them to join the SEA Facebook group: www.facebook.com/group.php?gid=2211886560

Post the SHARP network's URL in your AIM or Google Chat away message (SHARP.SEforA.org).

Subscribe to the YouTube channel (www.youtube.com/user/SEforAdotCom) to rate and comment on the videos posted of politicians speaking on key science issues.

College friends. More than likely you were some sort of science major in college, so there is a good chance you weren't the only one to go to graduate school.

Follow @SEANews on Twitter for up-to-date policy news

Call up your old classmates, find them on Facebook, or fire off an email: "You should check out this thing I'm getting involved in."

After you catch their interest, ask for their email address, and send them more information. Follow up to see how they're doing in a week and then a month. Hopefully with a little help they can also get a chapter of SEA up and running at their institution in no time.

Remember, there's no better way to spread the message than word-of-mouth!

Hans Arora (h-arora@northwestern) is co-President of Northwestern University's (Chicago) SEA Chapter.

SEA Unveils Business Cards

Thanks to an idea from Hans Arora, SEA has created chapter business cards for you to pass out to your peers at other universities. See sample card below. If you would like 20 sent to you, or 50 to a chapter, please email Meredith at Meredith.Blunda@sefora.org. Spread the word!

SEA
SCIENTISTS & ENGINEERS FOR AMERICA

www.SHARP.SEforA.org
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Contact me about SEA chapters:

FRONT

Learn more about our programs:

-The SHARP Network
-Student chapters
-Training scientists and engineers to run for office
-Redistricting project
-Science policy news alerts

SEA works to bridge the gap between science and politics.

BACK

Upcoming Activities

MARCH

The Role of Science & Technology in Economic Stimulus Panel Discussion

Date: March 31
Time: 5:00pm CDT
Location: Northwestern University– Evanston Campus, Ryan Hall 4003
*Video of the event will be posted online following the event: www.nuspan.org

APRIL

Graduate and Post-Doctoral Education Policy Forum

Date: April 7
Time: 7pm EDT
Location: University of Alabama at Birmingham
Guest: Bryan Noe, Dean of the Graduate School

Press Conference Call

Date: April 9
Time: TBD
Guest: Monica Amarelo, Press expert that has worked with AAAS and FAS
*Call is open to all chapter members.

Webinar: Science Policy in Today's Government

Date: April 14
Time: 6:00 pm EDT
Guest: Diane C. DiEuliis, Ph.D., Assistant Director, Life Sciences, Office of Science and Technology Policy (OSTP)
*Policy calls are open to all chapter members.

Earth Day Activity Deadline

Date: April 22
Location: All Chapters

MAY

From A Career in Science to a Career in Congress Seminar

Date: TBD
Location: Northwestern University– Evanston Campus
Guest: Rep. Bill Foster (D-IL)

SEA STAFF

From Left to Right: Michael Stebbins (of SEA-Action Fund), Lesley Stone, Bernard Yu, Meredith Blunda, Elizabeth West