



Florida Energy Systems Consortium

December 2013 Issue

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December 2013 Issue

World Energy News

FESC Highlights

Florida Energy News

U.S. Energy News

Funding Opportunities

Upcoming Events

- Jan 31** The 3rd Annual Florida Colleges Energy Education Forum
Palm Beach State College
- Feb 19-20** 41st Annual PURC Conference: Politics & Policy: What is Next for Utilities? Gainesville, FL
- Mar 6-7** iiSBE Net Zero Built Environment 2014 Symposium Gainesville, FL.
- Mar 26-27** Africa Photovoltaic Solar Energy Conference and Exhibition, Durban, South Africa
- May 12-13** Florida Energy System Consortium Workshop; Gainesville, FL



IEA World Outlook: Six Key Trends Shaping the Energy Future



The swirl of headlights and taillights marks the traffic flow at a busy Petrol China gasoline station. Two-thirds of future growth in energy demand will come from Asia, led by both China and India, says the International Energy Agency's 2013 World Outlook.

Thanks to "fracking," the United States is reaching the top spot among world oil producers sooner than expected, and is "well on its way to realizing the American dream" of energy independence, the International Energy Agency (IEA) said Tuesday.

"But this does not mean that the world is on the cusp of a new era of oil abundance," the IEA warned in its closely watched annual World Energy Outlook. Instead, the agency predicted that no other country will replicate the United States' success with hydraulic fracturing and other unconventional technologies that have led to the North American boom in oil and natural gas production. (See related "[Interactive: Breaking Fuel From Rock](#)," "[The Great Shale Gas Rush](#)," and "[The New Oil Landscape](#).")

And by the mid-2020s, the Middle East—the world's only source of low-cost oil—will again be unchallenged as the most important and influential source of oil supply on the globe.

The Paris-based IEA was established after the oil crisis of the early 1970s in

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a move by oil-consuming nations to keep better track of trends and improve energy security. Its annual World Energy Outlook, with hundreds of pages of analysis and charts, is considered the industry bible. Here's a rundown of key trends IEA identified as shaping the world outlook this year:

1. U.S. energy boom is unique, has risks.

A year ago, IEA upended global conventional wisdom by declaring that the United States, thanks to unconventional technologies like fracking, would overtake Saudi Arabia as the world's largest oil producer of oil by 2017. IEA now projects the United States will reach the top spot two years earlier, by 2015, producing 11 billion barrels of oil a day. (See related blog post, "[U.S. Edges Saudi Arabia, Russia in Oil and Gas](#).") But the agency says U.S. production will peak at nearly 12 million barrels a day by 2025 and then start to slowly decline.

IEA notes that there is a steep decline rate for shale oil and natural gas wells tapped by hydraulic fracturing, the unconventional technology that has been key to U.S. success. Maintaining high output will require continuous investment in drilling new wells to compensate for declines at existing ones, the agency said. (See related, "[Natural Gas Nation: EIA Sees U.S. Future Shaped by Fracking](#).")

IEA notes that many nations hope to replicate U.S. success in fracking, and areas of Argentina, Russia, China, and the Middle East seem promising. But "good geology alone is not sufficient to replicate the U.S. experience," the agency said. Outside of the United States, there's neither the legal environment nor the oil services industry capacity to make shale oil and gas development worth the cost. More than 6,000 wells were drilled for unconventional oil in the United States and Canada in 2012, and only 100 outside of North America.

2. Fossil fuels will still dominate the scene.

IEA expects renewable energy generation to double by 2035 under existing policies. But solar, wind, and hydropower are not on track to catch up with oil or coal, and world primary energy demand is on track to increase 43 percent.

Today's share of fossil fuels in the world energy mix—82 percent—is the same as it was 25 years ago. And by 2035, the IEA forecasts that fossil fuels will barely give up ground, providing 75 percent of global energy. (See related interactive: "[The Global Electricity Mix](#).")

Governments around the world subsidized consumption of fossil fuel to the tune of \$544 billion last year—more than five times greater than supports for renewable energy, which totaled \$101 billion in 2012. IEA expects subsidies for renewables to more than double to \$220 billion by 2035, but they will still be overshadowed by government supports for fossil fuels without reform. (See related "[Global Energy Subsidies Map](#)," and "[Quiz: What You Don't Know About Energy Subsidies](#)" and "[Pictures: Eleven Nations With Large Fossil Fuel Subsidies](#).")

Unsurprisingly, given the expected energy mix, carbon dioxide emissions from energy are expected to continue their upward movement, jumping 20 percent by 2035. This leaves the world on a trajectory consistent with a long-term average temperature increase of 3.6°C (6.5°F), far above the internationally agreed 2°C (3.6°F) target. (See related "[Quiz: What You Don't Know About Climate Change Science](#).")

3. India will edge China as "engine" of energy demand.

Meanwhile, the world's thirst for oil is not slacking. Under the energy and climate policies that nations currently have in place, the IEA expects demand for oil to increase 27 percent between 2012 and 2035, to 111 million barrels a day. Fully two-thirds of that growth will come from Asia, with China in the lead. (See related "[Pictures: A Rare Look Inside China's Energy Machine](#).")

China will remain Asia's biggest market, but "the volumetric growth in Indian demand (between 2020 and 2035) is larger than that of China," the IEA said. "India will be the engine of global demand growth," said the IEA's chief economist, Fatih Birol. (See related, "[India Power Outage Spotlights Blue Energy Planning Failure](#).")

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Demand will also accelerate greatly in the Middle East, which will account for 10 percent of growth in energy demand through 2035. By 2035, Middle Eastern countries will be gobbling down nearly 10 million barrels of oil a day, or about the same amount that China is consuming today.

Demand in developed countries like the United States and much of Europe will actually decrease between now and 2035, largely because of improved energy efficiencies, particularly tougher automotive fuel standards.

4. Move over, automobiles. The age of trucks is here.

Transportation and petrochemicals are the two sectors that are clearly driving future energy demand, Birol said. But trucks, not cars, are behind the growing consumption of oil. One-third of the volume of growth is caused by truck traffic, and the IEA expects diesel demand to grow three times faster than demand for gasoline.

The growing demand for oil from the petrochemical industry is due to plastics for industrial and consumer goods, and packaging—everything from smartphones to water bottles.

Another big factor in demand is fossil fuel subsidies, which the agency estimates totaled \$544 billion last year. Oil was the most heavily subsidized fuel, accounting for 51 percent of the total. Consumption subsidies were largely centered in net energy-exporting countries, or 75 percent of the total.

5. Renewable energy giant Brazil set to be major oil exporter.

IEA Executive Director Maria van der Hoeven noted that "major changes were emerging in the energy world," and one of the transformations is happening in Brazil, due to the massive deepwater oil resources unearthed by new seismic technologies. More super-giant fields, most of them offshore, have been discovered in Brazil over the past decade than anywhere else in the world. The IEA predicts Brazil's oil production will triple to 6 million barrels per day by 2035, accounting for one-third of the net growth in global oil production and making the South American nation the world's sixth-largest oil producer.

But Brazil is expected to maintain a green energy mix for its own needs. (See related, "[Power Quest: Brazil Works to Wipe 'Blackout' From the Lexicon.](#)") Thanks to its huge hydropower stations and its government-driven drive to promote domestically produced sugarcane ethanol, almost 45 percent of the country's primary energy demand is met by renewable energy, making Brazil's energy sector one of the least carbon-intensive in the world. And by 2035, it will rely on fossil fuels for less than 20 percent of its own energy needs, the IEA projects. (See related: "[Pictures: A River People Await an Amazon Dam.](#)")

6. Reliance on costly imports means long-term hurt for Europe.

The burden of costly fossil fuel imports will fall heavily on the European Union in the years ahead, the IEA projects. EU annual spending on foreign oil and natural gas, already more than \$500 billion a year, is expected to grow nearly 10 percent and will sap 2.3 percent of GDP by 2035, says the IEA. (See related, "[No Freeze on Winter Energy Prices, Despite U.S. Gas Boom.](#)") In contrast, the United States will see its already much-lower spending on fossil fuel imports (closer to \$300 billion a year) fall some 50 percent, so that it will be sending only 0.5 percent of GDP overseas for fossil fuels by 2035.

The price of natural gas in the EU is now triple the price in the United States; Japan is paying nearly five times as much. That leaves energy-intensive industries like iron, steel, petrochemicals, and concrete in the EU and Japan at a huge competitive disadvantage. The IEA reckons that the United States' share of the global market for energy-intensive goods will grow by one percent, while the European Union's will drop by 10 percent, and Japan's by 3 percent. "This is a structural issue for these countries," Birol said. "This sector is crucial," accounting for, on average, 25 percent of industrial employment.

The IEA notes that these energy trends, along with political concerns about the potential loss of economic competitiveness, could well erode international efforts to tackle both trade barriers and climate change in the years ahead.

USF Professor Yogi Goswami Captures Solar Energy Using Salt Balls

To Florida's big utilities, the Sunshine State isn't as bright as its nickname indicates. Too cloudy. Too hazy. Too much darkness. It just doesn't have the pounding rays of, say, Arizona or parts of California. As such, the reasoning goes, the *Sort of Sunny State* isn't great for solar energy — unless someone develops storage technology to overcome those limitations.

Enter Yogi Goswami, an internationally renowned mechanical engineer at the University of South Florida. His solution: salt-filled ceramic balls that can turn water into steam for hours after the sun disappears. The steam powers turbines that produce electricity, in much the same way as burning coal.

Goswami, 65, isn't the only researcher to develop a solar thermal storage technology for renewable energies. And he's not the only one to use salt as a main component.

But he has devised a way to concentrate the energy storage into golf ball-size capsules that even at high volumes take up little space, reduce costs and last longer than other technologies so far.

"We think that this has a bright future," Goswami says. "For solar, in my view, (storage) is essential."

In the renewable energy world, building a cost-effective, utility-scale system that can store solar power for hours at a time is a Holy Grail of sorts.

"That will be a game changer," Duke Energy Florida president R. Alexander "Alex" Glenn told state lawmakers last spring. "Storage is going to be critical."

A race is on to develop the best technology. A few systems are already in use or being tested. Duke Energy for instance operates one of the nation's largest storage technologies at its Notrees Battery Storage Project that uses lead-acid battery blocks at a wind farm in Texas.

Arizona's Solana Generating Station already uses a salt-based storage system that powers two 140-megawatt turbines that generate electricity for as long as six hours after sunset. The system produces enough power for 70,000 Arizona Public Service customers.

Goswami's system is similar to Solana's, but instead of large tanks full of salt, his system employs small balls. Goswami began with encasing salt in nickel and zinc. To increase efficiency, he moved to ceramic casings, with help from a partnership with electronics and ceramic maker Kyocera Corp., based in Kyoto, Japan.

During the day, solar thermal panels heat the balls to extremely high temperatures. The salt in the balls, which can be reused for years, melts to a liquid. The molten material keeps the balls hot enough in an insulated tank to turn water into steam for as long as 12 hours. The salt then turns back to a solid when it cools, and the process can start all over when the sun shines again. The steam could power turbines on demand during cloudy days or throughout the night.

The footprint for a 100-megawatt storage system, which could power about 36,000 homes, would be about 40 feet by 40 feet. The size of Goswami's storage is one of its advantages. By using the small balls, it takes less time to melt the salt, and the heat in the balls is projected to last hours longer than the system in Arizona, which also uses a lot more salt.

Goswami thinks he can drive costs down to \$2,000 per kilowatt for the solar thermal system and \$15 per kilowatt hour for the storage. Other solar systems and storage have been costing \$3,000 per kilowatt for the system and \$40 per kilowatt hour for the storage.

The hitch: No one has yet agreed to build one for commercial use.

Haresh Kamath, program manager for energy storage at the Electric Power Research Institute, an organization largely funded by the utility industry, says Goswami's system "has some promise and should



A small model at USF demonstrates a system that collects solar energy and stores it as heat in small balls filled with salt. EDMUND D. FOUNTAIN | Times

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be investigated."

Goswami's pricing would make the system financially competitive, said Kamath, and the size of the storage is "a pretty small amount of space."

"It's something that needs significant testing before it's ready for deployment," Kamath said.

The Solana solar power plant in Arizona shows that the technology can work, he added.

"It's not only under consideration, it is actually being used," Kamath said. "Not this particular technology, but similar technology."

Randy Wheelless, a Duke Energy spokesman, said the company would need to see Goswami's technology used with a utility-scale power plant.

"We haven't really been looking at that technology," Wheelless said. "Thermal salt storage isn't that ground-breaking.

"Obviously, it needs to be a certain scale," he said. "How do you get this to scale?"

Goswami's confident response: Test it. It's ready.

• • •

Goswami began developing the system in the 1990s while at the University of Florida.

His initial financial backing came from the U.S. Department of Energy, Florida Power & Light and Florida Power (now Duke Energy). UF, FPL and Florida Power each owned a third of the patent at the time. USF currently owns the entire patent.

Goswami said the power companies abandoned the project when they returned their focus to more traditional forms of generating power. With no companies licensing the technology, the university did not renew the patent.

But Goswami powered on.

The University of South Florida hired him away from the University of Florida, and Goswami became the John and Naida Ramil Distinguished Professor and the co-director of the university's Clean Energy Research Center.

John Ramil, president and chief executive officer of TECO Energy, the state's third largest investor-owned utility, said Goswami's stature in Florida and the world warrants serious consideration of his work.

"We are fortunate to have Dr. Goswami at USF," Ramil said. "He's an internationally recognized researcher and leader in the energy field.

"Dr. Goswami's work to expand the usefulness of solar energy — to match customer consumption patterns — is valuable research that could have a lasting effect on the energy industry."

• • •

When it comes to solar, Florida remains a laggard, trailing not-so-sunny places like New Jersey and Massachusetts.

In his testimony to state lawmakers last spring, Glenn, the head of Duke's Florida operations, said solar simply isn't ready for prime time.

"Florida is not the greatest renewable state," Glenn said. "We are the Sunshine State, but we're also the partly cloudy state. What we have to do is develop a storage technology."

To Goswami, it's more a matter of Duke and other utilities embracing what is already available.

The sun is "the only inexhaustible (fuel) source," Goswami said. "I'm not a purist who would say only use solar. Solar is intermittent. You can't ignore that. You have to have your diversity of sources."

But he said all fuel sources need to be managed.

"You use diversity of fuel sources, but in a sustainable way," Goswami said. "You use fossil fuels, but in a sustainable way."

Another reason solar has failed to blossom in Florida: It made little financial sense, thanks to electric rates that are much lower here than up

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North.

But the electricity rates in Florida are starting to rise. Meanwhile, the cost of solar continues to fall and expectations are that it will soon be on par with what residential customers pay the utility for electricity.

Goswami sees his system lowering costs even more.

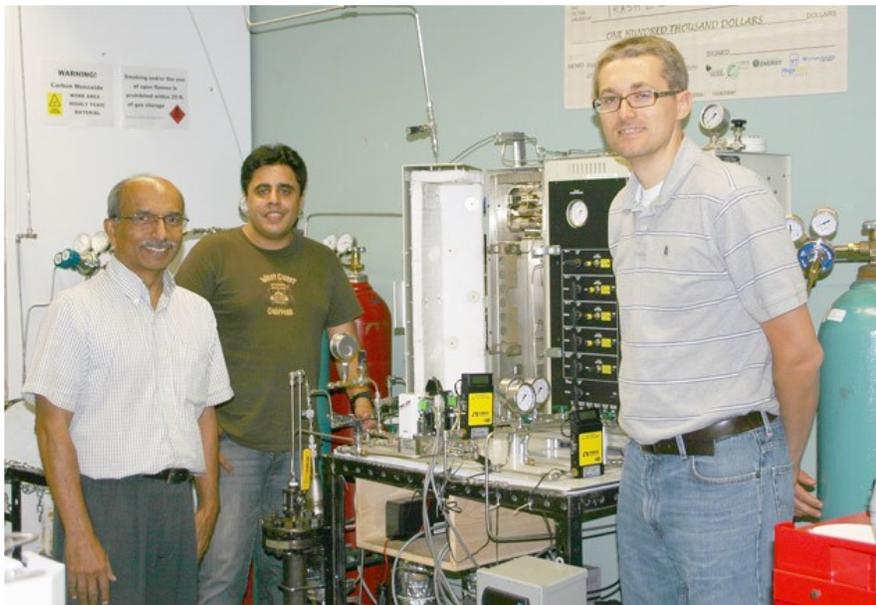
He is working to reduce the size of the balls used for his system to make them even more efficient, much like computer servers evolved from filling a warehouse in the 1960s to a desktop today.

It's these kinds of advancements that he thinks the utility companies ignore at their own peril.

USF Startup Named Finalist for the 2013 Southeast Region Finals of the Cleantech Open

"Innovation knows no limits," Goswami said. "The utility companies have to recognize that or they will be left behind."

Trash2Cash-Energy LLC, a University of South Florida startup company, has been named as a finalist at the 2013 Southeast Region Finals of the Cleantech Open, the world's largest accelerator for clean technology companies.



left: Babu Joseph, Syed Gardezi and John Kuhn.

According to Cleantech, the five finalist companies were selected from among 20 companies founded by cleantech entrepreneurs who entered the Southeast regional accelerator of the Cleantech Open this year. Trash2Cash Energy was both named as a finalist and recognized with the Sustainability Award.

Trash2Cash has licensed from USF a proprietary gas-to-liquid process that converts naturally produced landfill gas to hydrocarbon fuels specific to their customers' need, such as gasoline, diesel, or aviation fuel. The company was founded in 2012 by USF Assistant Professor John Kuhn and Professor Babu Joseph, USF student Syed Gardezi, and recent USF graduates Timothy Roberge and Devin Walker.

The company's gas-to-fuel technology, says Kuhn, is a revolutionary, patent pending process that not only provides a renewable source of energy but greatly reduces the amount of emissions produced by the landfills.

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As a regional finalist, Trash2Cash will receive a “Startup in a Box” package that includes cash and donated services worth up to \$20,000, and will compete next at the Cleantech Open Global Forum, Nov. 20-21, 2013, in San Jose, CA. The winner will receive a \$200,000 award package and the title of 2013 Top Cleantech Entrepreneur. The Cleantech Open is a nonprofit organization that fosters the most promising startups in clean technology fields through a nine-month program that includes education, relationship building and funding opportunities. The program encourages cleantech entrepreneurs from around the nation to compete for local recognition and for a part of the overall \$1 million purse for the national winners.

“We saw the Cleantech Open as a network and investor-friendly opportunity,” said Walker, who serves as the company’s COO. “We are raising capital to fund a pilot unit, which will enable us to demonstrate the technology for customers in Florida.”

UM-Led Coastal Experiment to Study Path of Oil Spills Begins

A University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science-led study to understand the path of oil or other pollutants in coastal areas begins offshore of Ft. Walton Beach, Florida today. During the three-week SCOPE Experiment – Surfzone Coastal Oil Pathways Experiment – scientists will deploy GPS-equipped drifters and other advanced instruments to study the ocean currents along the coast to better understand how oil may move onshore in the event of a future spill.

“In the aftermath of the Deepwater Horizon oil spill it became clear that understanding the ocean currents in the surfzone is vital to improve our understanding and prediction of oil spills,” said Dr. Tamay Özgökmen, UM Professor and Director of the Consortium for Advanced Research on Transport of Hydrocarbons in the Environment (CARTHE). “There are catastrophic socio-economic impacts when oil spills reach our beaches.”

UM Professor Ad Reniers and his colleague Professor Jamie MacMahan from the Naval Postgraduate School in Monterey, Calif., will deploy a variety of instruments, including 200 GPS-equipped drifters, unmanned aerial vehicles and pressure and dye sensors at the surface and at varying depths, to measure the movement of ocean currents along the coast to study how oil, fish larvae, or toxins in the water are carried by currents close to shore.

“This study will collect important data necessary to understand the ocean currents in the near-shore marine environment,” said Reniers, associate professor of applied marine physics at the UM Rosenstiel School and lead investigator of the SCOPE Experiment. “The information collected will be used to develop computer models of the coastal zone, to improve our scientific understanding of this region in the event of a future oil spills, as well as to better understand how larvae or water pollutants travel close to shore.”

The unmanned aerial vehicles will be equipped with cameras to monitor the drifters and used in a dye experiment, where EPA-approved colored dye is placed in the near-shore waters to collect visual data on the movement of currents. Several of the drifters being deployed during the experiment were designed by students from three Florida high schools, MAST Academy, South Broward High School and Maclay School, as part of a CARTHE-sponsored educational outreach program. This research is made possible by a grant from the Gulf of Mexico Research Initiative (GoMRI). The GoMRI is a 10-year, \$500 million independent research program established by an agreement between BP and the Gulf of Mexico Alliance to study the effects of the Deepwater Horizon incident and the potential associated impact of this and similar incidents on the environment and public health. For more information, visit <http://gulfresearchinitiative.org>.

SCOPE is the second large experiment conducted by CARTHE that brings together a wide range of scientific experts and experiment with measurement methods to study oil spills. The first experiment, called GLAD (Grand Lagrangian Deployment), was conducted near the Deepwater Horizon site in the summer of 2012 also under the support of GoMRI. Information collected by scientists from both experiments will be used to model the transport and fate of oil in the Gulf of Mexico, in the event of a future spill.

The SCOPE Experiment is a project of the UM-based CARTHE. The CARTHE program includes 26 principal investigators from 12 research institutions in eight states. Together these scientists are engaged in novel research through the development of a suite of integrated models and state-of-the-art computations that bridge the scale gap between existing models and natural processes. For more information about CARTHE, please visit www.carthe.org or on Facebook at www.Facebook.com/carthe.gomri

FSU to Unveil Florida's New High-Tech, High-Speed Wind Tunnel

The FSU-headquartered [Florida Center for Advanced Aero-Propulsion](#) (FCAAP) will host a formal commissioning of the state's brand new polysonic wind tunnel on Monday, Nov. 18, in Tallahassee.

The one-of-a-kind wind tunnel is unique among research university environments, combining test speeds that can reach Mach 5, with high-tech monitoring equipment and scientific expertise in order to help solve major design challenges being faced by aerospace industry experts.

"The commissioning of this polysonic wind tunnel marks a major milestone in Florida's aerospace research capabilities," said Farrukh Alvi, director of FCAAP. "Current high-speed wind tunnel testing takes place in very large facilities that are expensive to run and rely on aging technology. Our wind tunnel is of optimal size, costs significantly less to operate and utilizes unique technology that can provide our industry partners with the information they need to solve problems and propel the aerospace industry forward."



**Farrukh Alvi, director of
FCAAP**

The commissioning is 9 a.m. Monday, Nov. 18, at the Florida Center for Advanced Aero-Propulsion, 2003 Levy Ave.

Established in 2008 by the Florida Legislature, FCAAP's central feature is the partnership between Florida State University, the University of Florida, the University of Central Florida and Embry-Riddle Aeronautical University. Through the partnership, each university contributes its particular aerospace and aviation expertise to the larger research effort, creating a one-stop-shop for aerospace stakeholders — industry and government agencies, looking for solutions to technical or scientific problems. Equally important, the shared expertise approach pulls double-duty by creating interdisciplinary learning environments that churn out highly trained scientists and engineers.

To learn more about the new polysonic wind tunnel, visit the [Florida Center for Advanced Aero-Propulsion](#).

FSU Engineers Net More than \$1 Million for Materials Research

Florida State researchers have been awarded more than \$1.4 million from the National Science Foundation to develop a system that will produce large amounts of a state-of-the-art material made from carbon nanotubes that researchers believe could transform everything from the way airplanes are built to how prosthetic limbs fit the human body.

"The goal is clear — to show industry the ability to use this in large-scale quantities," said Richard Liang, director of FSU's High-Performance Materials Institute (HPMI) and a professor for the FAMU-FSU College of Engineering. "We're looking at a more efficient, cost effective way to do this."

The material, buckypaper, is a feather-light sheet made of carbon nanotubes that is being tested in electronics, energy, medicine, space and transportation. The aviation industry, for example, is doing tests with buckypaper, and it's projected that it could replace metal shielding in the Boeing 787, currently made up of 60 miles of cable.

Engineers believe that replacing the cable with buckypaper could reduce the weight of the Boeing 787 by as much as 25 percent.

Florida State researchers have been engaged in other projects with buckypaper as well, including the use of the material in creating more advanced and comfortable prosthetic sockets for amputee patients and multifunctional lightweight composites for aerospace applications.

As revolutionary as buckypaper technology is, a major hurdle for its future use is that it can take two or more hours and can cost as much as \$500 to make just a small 7-inch by 7-inch piece. Companies like Boeing need large amounts of it to use on an aircraft.

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However, the current process is neither fast nor cheap.

So, Liang will spend the next four years developing a process to produce large-scale amounts of buckypaper. The process and materials would then be patented and marketed to meet the demands of the industrial partners.

Liang will be joined on the project by Arda Vanli, an HPMI researcher and an assistant professor in the Department of Industrial and Manufacturing Engineering, as well as researchers from Georgia Institute of Technology.

To learn more about the team leading this research, visit the [High-Performance Materials Institute](#) website. To view a short video about the potential of Buckypaper, visit "[Unlocking the power of nanotechnology.](#)"

Advancing U.S. Renewable Energy and Electric Grid

UCF has been awarded \$3.2 million to lead one of four national consortia to develop distributed technologies, to increase engineering capacity, and to prepare for a national shift from traditional sources of electricity to renewables such as solar and wind.

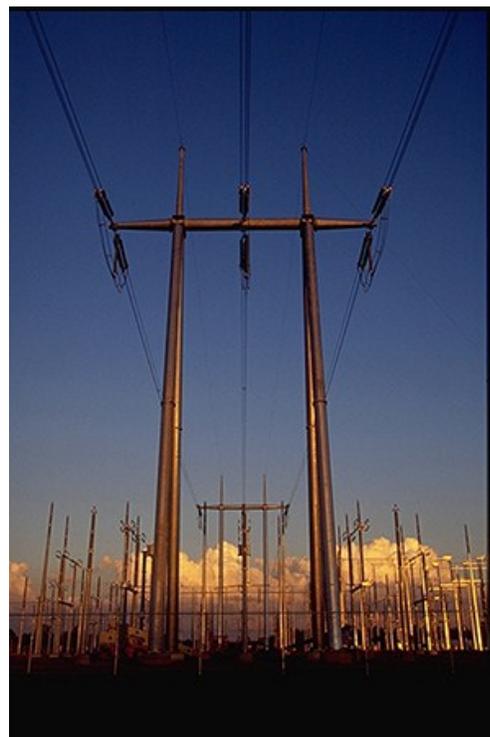
"This multi-university collaborative effort demonstrates our institutional commitment to being one of America's leading partnership universities," said Michael Georgiopoulos, dean of the College of Engineering & Computer Science.

The team's winning proposal, Foundations for Engineering Education for Distributed Energy Resources (FEEDER), is a part of broader U.S. Department of Energy (DOE) investment of \$12 million to increase the nation's capacity to support distributed energy technologies. FEEDER is supported by the DOE's SunShot Initiative and through the Grid Engineering for Accelerated Renewable Energy Deployment (GEARED) program.

The FEEDER center will bring together seven universities (Auburn University, Florida State University, University of Arkansas, UCF, University of Florida, University of Kentucky, and University of South Carolina); eight utility companies (including Duke Energy, Florida Power & Light, Southern Company, Orlando Utilities Commission); two national laboratories (National Renewable Energy Laboratory and Los Alamos National Laboratory); and eight industry partners (including Siemens, SAIC, LEIDOS, and Schneider Electric) to speed up the development of technologies needed to prepare nation's electric grid to operate on renewable energy sources.

Specifically, the FEEDER center will research technological components such as distributed control, optimization, advanced communication, renewable generation and smart grid, to transform the electric grid. It will also focus on education by establishing cross-institutional smart grid curriculum, facilitating research collaborations among the academic, utility and industrial partners, and incorporating the latest and most relevant research findings into new educational materials and courseware, said Zhihua Qu, professor and chair of Electrical and Computer Engineering (ECE) at UCF and the lead researcher on the FEEDER grant.

Within UCF, the project team consists of seven faculty members in the relevant technical areas and also involves UCF's Florida Solar Energy Center (FSEC). ECE and FSEC have successfully completed their grid integration projects for the DoE and are also being funded by the National Science Foundation, the U.S. Department of Transportation, and Harris Corporation to conduct fundamental and applied research in smart grid, electric vehicles, as well as solar and ocean energy.



University researchers, led by UCF, are developing ways to shift from traditional power distribution channels like this electrical substation, to smaller distributed sources such as solar.

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By upgrading the power engineering systems engineering programs at participating universities, FEEDER aims to attract and educate more students to become future power engineers, to address real-world research & development challenges, to train existing workforce and speed up technology transfers, and to realize smart grid implementation, said Qu. FEEDER's 31 electrical engineering faculty focus their efforts on improving energy independence and sustainability for our nation and its economy.

DOT Selects UCF to Develop "Smart Grid" for Plug-in Electric Vehicles

As interest in electric vehicles continues to keep the automotive industry charged, the nation is strategizing how to best integrate plug-in vehicles with its electrical grid and highways. Now, with funding from the U.S. Department of Transportation for the creation of the first transportation center with a focus on electric vehicles, the University of Central Florida will help chart that course in Florida.



The Electric Vehicle Transportation Center operated by UCF's Florida Solar Energy Center in Cocoa is a newly funded, four-year, \$9 million research effort to help develop the nation's electric-vehicle transportation network. Research conducted by the center will help transportation planners prepare our nation's highways for the influx of plug-in electric vehicles (PEV), while developing "smart grid" applications that will strengthen the ability of our electric system to accommodate the power demands of electric vehicles.

PEVs need a reliable, predictable network of charging stations to allow them to travel long distances without the fear of "running out of fuel." Workplace charging, community charging, and highway fast-charging systems are in development. A new PEV transportation network designed in conjunction with the modernization of our electric grid system will result in a sustainable highway and energy network.

"Today, electric vehicles—using Florida utility power—operate at an equivalent gasoline price of 99 cents a gallon," said FSEC director James Fenton. "With fuel costs that low, it's no surprise projections indicate that Florida will have as many as 500,000 electric vehicles on its roads within 10 years, placing an unprecedented demand on today's utility grid."

Plug-in electric vehicle sales in the U.S., led by the Volt, Leaf and plug-in Prius, were 50,000 in 2012. The upward trend in sales is expected to continue during the next several years as automakers introduce up to 40 different plug-in models.

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Transformation of the U.S transportation system into one that uses electricity and its integration into a dynamic electrical grid will occur over many years and require extensive research and development.

The new Electric Vehicle Transportation Center will leverage the resources of the University of Central Florida and its partner universities – the University of Hawaii and Tuskegee University – to conduct the research and development, and to train and support the scientists, engineers and technicians of the future.

The University of Central Florida’s EVTC is among 33 universities funded to address critical transportation challenges facing the nation. To view a map of the selected universities, go to: <http://www.rita.dot.gov/utc/sites/rita.dot.gov/utc/>

UF Researcher: Southeast Must Prepare for Wild Weather from Climate Change

People who live in the southeastern United States should begin to prepare for more drastically changing weather conditions — everything from heat waves to poorer air quality – caused by climate change, according to a new book, edited by a [University of Florida](#) researcher.

The book, which UF’s Keith Ingram helped write, is titled “Climate Change of the Southeast United States: Variability, Change, Impacts and Vulnerability.” Ingram was the book’s lead editor.

Principal authors and editors, including Ingram, unveiled the book Tuesday. Ingram is director of the Southeast Climate Consortium and an associate research scientist with [UF’s Institute of Food and Agricultural Sciences](#).

“The Southeast already experiences extreme weather events including floods, droughts, heat waves, cold outbreaks, winter storms, severe thunderstorms, tornadoes and tropical cyclones. In the future, these events are likely to become more frequent or more severe, causing damage to most of our region’s agriculture, stressing our region’s water resources and threatening human health,” he said. “The sooner we make preparations, the better off we’ll be.”

As defined in the book, the Southeast includes Florida, Georgia, South Carolina, North Carolina, Virginia, Tennessee, Kentucky, Arkansas, Louisiana, Mississippi, Alabama, the Virgin Islands and Puerto Rico.

Specific findings include:

Average annual temperatures are projected to increase through the 21st century, with the region’s interior projected to warm by as much as 9 degrees Fahrenheit;

- Cold days will become less frequent and the freeze-free season will lengthen by up to a month
- Temperatures exceeding 95 degrees are expected to increase across the Southeast and heat waves are expected to become longer by between 97 percent and 234 percent through the end of the century;
- Sea levels will likely rise by an average of 3 feet by the end of this century. Of particular concern is that storm surges will compound impacts of rising sea levels, Ingram said. People will have to raise existing structures and build new structures on filled soil, he said. Many cities and counties will have to build or refit water and sewer plants so they can survive rising waters caused by floods, Ingram said. Many builders, residents and governments are already doing these things, he said.
- While the number of tropical storms is projected to decrease slightly, the number of category 3 to category 5 hurricanes is expected to increase;
- High temperature stresses in summer will become more frequent and damaging to agriculture, and will possibly drive dairy

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and livestock production farther north. Warm weather during winter months reduces yields of blueberry, peach and other crops that need cool temperatures for flower buds to break, he said.

- Air quality is projected to decline and pollen counts will go up, damaging human health.

Residents of the Southeast should begin to prepare for the likelihood of more frequent extreme weather events, Ingram said.

With 26 percent of the U.S. population living in the Southeast, the region produces 25 percent of the country's carbon dioxide emissions, which are partly responsible for the climate change problem, Ingram said.

"We are a significant contributor, but we can help with the solution," he said.

The Southeast Climate Consortium works with extension agents and farmers to bring them valuable research.

"We work on how to adapt to or mitigate climate change," Ingram said.

Some local governments have agreed to reduce carbon emissions, the authors said Tuesday.

Several agencies helped produce the report. They include three NOAA-funded Regional Integrated Sciences and Assessments Centers: the Southeast Climate Consortium, the Carolinas Regional Integrated Sciences and Assessments and the Southern Climate Impacts Planning Program.

NSF Awards Grant to UM to Measure Changes in Ocean Circulation

Oceanographers from University of Miami, Duke University, and the Woods Hole Oceanographic Institution have received \$16 million in grants from the National Science Foundation to deploy a new observing system in the subpolar region of the North Atlantic. The observing system will measure the ocean's overturning circulation, a key component of the global climate system.

The five-year initiative is part of the \$32 million, U.S.-led Overturning in the Subpolar North Atlantic Program (OSNAP). International collaborators include scientists from Canada, the United Kingdom, Germany, France and the Netherlands.

"The program is very exciting, because it provides us with a first opportunity to directly link changes in the intensity of the North Atlantic overturning circulation with the air-sea interaction processes that drive deep water formation," said William Johns, the lead project scientist from the University of Miami. "The program also successfully combines a number of existing national programs into a single observing system. It has taken a lot of work to put it all together, but it has the chance to transform the way we think about and understand the Atlantic overturning circulation."

The overall goal of the program is to simultaneously measure the surface ocean currents that carry heat northward toward the Arctic Ocean, and the deep ocean currents that carry cooler waters southward toward the equator. Together, these currents form the overturning circulation that plays a role in redistributing heat from the equator to the poles. Recent modeling studies have shown a change in strength in this circulation would have a critical impact on temperatures and precipitation in North America, Europe and Africa.

In addition, the OSNAP array affords the opportunity to study how overturning changes impact the environment. OSNAP



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measurements will facilitate the study of how changes in the northward flow of warm water affects the reduction of Arctic sea ice and the shrinking of the Greenland Ice Sheet.

Duke, Woods Hole and Miami oceanographers, along with their international partners, will deploy moored instruments and sub-surface floats across the subpolar North Atlantic during the summer of 2014. The measurement period will last until 2018.

The array of instruments will stretch along two lines, from Labrador to southern Greenland and from Greenland east to Scotland. The instruments will provide the scientists with continuous measurements of surface-to-bottom water temperature, salinity, and velocities in areas of the subpolar ocean that historically have been under-sampled. Trajectories of the subsurface floats will provide the first look at deep-water pathways in the North Atlantic.

The OSNAP measurement system complements a U.K.-U.S. program that has been measuring the overturning circulation in the subtropical North Atlantic since 2004. Differences and similarities in these measures will provide oceanographers insight into the working of the ocean's overturning.

Overturning measures are also critical for an understanding of the ocean's continued ability to act as one of Earth's most important carbon sinks.

Surface waters absorb heat-trapping carbon dioxide from Earth's atmosphere. When cold, dense south-flowing waters from subpolar regions sink, they carry the surface water – and much of the CO₂ it contains – into the ocean's depths, where it is no longer available to heat Earth's climate.

"It is critical that we learn more now about how changes in the overturning circulation affect heat and carbon storage in the oceans, and how these changes might feed back on our future climate, especially in view of the expected decline of the overturning circulation with global warming," Johns said.

The OSNAP program was designed at an international workshop led by Lozier at Duke in April 2010.

Principal U.S. investigators of the new program are Amy Bower, Fiamma Straneo and Robert Pickart, senior scientists in physical oceanography at Woods Hole; William Johns, professor of meteorology and physical oceanography at the University of Miami; and Lozier.

USF Unveils Revenue Incentive Program for University Inventors

OSNAP will be one of the first projects to make use of the new, NSF-funded Ocean Observatories Initiative's array of moored sensors located in the Irminger Sea, off the southern tip of Greenland.

The OSNAP project is funded by two NSF grants, OCE-1259102 and OCE-1259103.

The University of South Florida in Tampa (USF) has announced a ground-breaking Revenue Incentive Patent Cost Sharing Program for their university inventors. The Revenue Incentive program, one of the first of its kind among U.S. universities, provides a way for USF innovators to invest in the future of the inventions resulting from their research.

The university has launched a one-year pilot program to provide their researchers with the opportunity to increase their share of income generated from the licensing of their inventions. Inventors who participate will pay a portion of the direct costs incurred by the university for protecting, maintaining, licensing, and preserving the invention's patent rights. In exchange, inventors will receive additional revenue from the licensing of their inventions.

"We are excited to be a pioneer in employing this innovative program to promote faculty involvement and allow our inventors to benefit financially from their discoveries," said Valerie McDevitt, assistant vice president for Patents & Licensing at USF. "Our goal is to engage our faculty, who are our most valuable asset, and to lead the way with new opportunities to support the work of our researchers."

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"While not all university inventions will be eligible for the program, many will," added McDevitt, "and the potential return on investment to those inventors could be substantial, based on the commercialization of their technology, and provide a significant benefit to the inventors who participate."

"We strive to create an innovative culture at USF and to advance programs that incentivize and accelerate the advancement of our research and technologies," said Paul R. Sanberg, USF senior vice president for Research & Innovation. "I believe the Revenue Incentive program will be a positive venture for our inventors and could also serve as a model for other universities."

Details at <http://www.research.usf.edu/dpl/revenue-incentive.asp>

The University of South Florida is a high-impact, global research university dedicated to student success. USF ranks 50th in the

FSU Researchers Achieve Breakthrough In Superconducting Cable Technology

nation for federal expenditures in research and total expenditures in research among all U.S. universities, public or private, according to the National Science Foundation. Serving more than 47,000 students, the USF System has an annual budget of \$1.5 billion and an annual economic impact of \$3.7 billion. USF is a member of the American Athletic Conference.

Researchers at Florida State University's [Center for Advanced Power Systems](#) (CAPS) achieved a major breakthrough in their ongoing high temperature superconducting cable project that will lead to increased power generation and reduced weight for future naval vessels and aircraft.

CAPS researchers, under a grant from the Office of Naval Research (ONR), were able to conduct 3000 amperes of direct current through a 30 meter-long high-temperature superconductor (HTS) test cable that is cooled using pressurized helium gas. The development is significant because the use of gaseous helium allows operation at significantly lower temperatures, thus reducing the size and weight of the power cables. Traditionally, liquid nitrogen is used to cool HTS cables.

"This is the first helium gas-cooled superconducting power cable demonstration in the world," said Sastry Pamidi, the project's principal investigator at CAPS. "Achieving this amount of power conduction using a much more ship-friendly cooling medium such as gaseous helium is a major accomplishment. It offers the Navy unique flexibility for a power delivery cable as it works to design and build a new generation of all-electric naval vessels with 100MW generating capacity and high power loads."

Most existing naval vessels operate through the use of diesel engines and mechanical drives that power the propulsion system and use auxiliary generators to create electricity for other systems such as radar and weapons platforms. However, future ships will have large electrical loads equal to the propulsion power of the ship and will require large amounts of generation capacity, equivalent to that of a small city. All-electric ships will dramatically increase the energy efficiency of all onboard systems, increase maneuverability, and be capable of safely delivering the high amounts of energy needed by next-generation naval weapons platforms.

"It is gratifying to see that the investment and sustained support that ONR and FSU have made in CAPS over the years is paying off with such a significant world record result," said Steinar Dale, director of CAPS. "This latest achievement by the CAPS team builds on our earlier breakthroughs with superconducting technologies that promise to reduce the weight and cost of future shipboard power systems, an important requirement for the Navy."

The Navy is evaluating HTS cables involved in this energy breakthrough for their use in power distribution and other applications. NASA and the Air Force are also developing all-electric airplanes that will need compact superconducting cables similar to the one



Sastry Pamidi of the Center for Advanced Power Systems at Florida State.

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used in this project.

FSU Vice President for Research Gary K. Ostrander congratulated the CAPS team for reaching this significant milestone in their research efforts.

“Whether it is helping the Navy explore the power options available for more advanced ships, creating new uses for high-temperature superconductors or helping Florida and the nation improve its power infrastructure, CAPS continues to be an invaluable part of FSU’s materials and energy research focus,” Ostrander said.

Founded in 2000, CAPS conducts research on advanced modeling and simulation of electric power systems, advanced controls, power conversion equipment, and high-temperature superconducting devices. CAPS also provides extensive research opportunities for graduate and undergraduate students in many advanced technology areas such as power systems, controls, applied superconductivity and cryogenics that will enhance critical-thinking skills and problem-solving abilities. In addition to their research efforts, CAPS is helping several small businesses in developing components for superconducting technology for Navy applications.

Besides Pamidi and Dale, many researchers contributed to the breakthrough, including Chul Han Kim, Lukas Graber, Horatio Rodrigo, Danny Crook, Steve Ranner and Bianca Trociewitz. To learn more about this project and the unique infrastructure in helium gas cryogenics being developed at CAPS, visit the [Center for Advanced Power Systems](#).

Space Florida and the University of Central Florida Announce Tech Business Competition

Representatives from Space Florida and the University of Central Florida (UCF) Office of Research and Commercialization (ORC) announced a call for applications by companies interested in participating in an event that will match financing sources with small, high-tech businesses based in Florida.

The “CAT5 Awards,” (which stands for “Capital for the Acceleration of Technologies in early stage companies) will showcase 10 selected companies in an event that will enable them to present their business cases to venture capitalists, angel investors and financiers, among others. In addition to having the opportunity to present to potential funding sources, the top two business plans will receive \$150,000 in monetary awards – with first place receiving \$100,000 and second place receiving \$50,000, both through Space Florida sponsorship.



Finalists will present at the Innovation Concourse of the Southeast (ICSE) Manufacturing and Safety event on June 3, 2014. Prior to their presentations, the University of Central Florida’s Venture Accelerator will match finalists with expert mentors that will provide business strategy coaching leading up to the event.

"We are thrilled to work with UCF to promote the growth of Florida-based, high-tech businesses by enabling possible funding sources to hear their innovative business models," said Space Florida President Frank DiBello. "We believe Space Florida's additional financial award for the best business plans will also provide the top two forward-thinking companies a little extra support as they grow their businesses."

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Eligible companies must be pursuing research and development activities in at least one of Space Florida's strategic markets:

- Space Transportation and Advanced Aerospace Platforms
- Satellite Systems and Science Payloads
- Ground and Operations Support Systems
- Agriculture, Climate/Environmental Monitoring
- Civil Protection and Emergency Management
- ISS and Human Life Sciences (including medical research)
- Communications, Cyber Security and Robotics
- Adventure Tourism
- Clean/Alternative Energy Applications
- Advanced Materials and New Products

The application window for this opportunity begins September 30 and closes November 8, 2013 at 5PM EST. Finalists will be notified by mid-November, 2013.

UCF's Innovation and Economic Engine Success Catches National Attention

The [University of Central Florida](#) is a finalist in a national competition that recognizes institutions that are leaders in innovation and spurring economic prosperity.

The Association of Public and Land-grant Universities named six universities finalist for the first APLU Innovation and Economic Prosperity Awards.



The association recognized UCF's several programs that stimulate economic growth in Central Florida and for aggressively pursuing partnerships that benefit the region.

The university also was lauded for recruiting top students and faculty members in fields that are vital to the region's economy, promoting a campus culture that can adapt quickly to meet regional needs, and for effective leadership.

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“I am proud that Central Florida exemplifies for the nation how local and state governments, businesses, communities, and higher education can unite to advance prosperity,” UCF President John C. Hitt said. “Together, we help to create new companies, grow high-paying jobs, and boost the tax base. We are setting the standard for reinventing Florida’s economy.”

Other finalists include: Northern Illinois University, the State University of New York, the University of Cincinnati, the University of Memphis, and the University of Michigan.

Collaborating with local partners, UCF has achieved significant milestones recently in the areas of innovation and economic development. Among them:

- The university’s Business Incubation Program, which recently graduated its 100th company, was named Incubator Network of the Year in 2013 by the National Business Incubation Association.
- GrowFL, administered by UCF’s Economic Gardening Institute, has helped more than 400 Florida companies grow at a rate three times faster than their peers, adding more than 4,100 direct and indirect jobs.
- The Blackstone LaunchPad opened last month to empower UCF students who have ideas for businesses with the knowledge and skills they need to succeed. The LaunchPad, based in the Student Union, provides one-on-one coaching, seminars and access to a network of mentors and experts who can help students start successful businesses.
- The Florida High Tech Corridor Council, conceived by President Hitt in 1996 as a partnership with the University of South Florida, University of Florida and economic development organizations, has created an estimated 4,000 jobs and served more than 375 companies. The Council also has provided hands-on research experience for 2,500 students.

UCF also offers several academic programs focused on industries vital to Central Florida’s economy. Those include the College of Medicine, Florida Interactive Entertainment Academy, College of Optics and Photonics, Institute for Simulation and Training, and College of Engineering and Computer Science.

“Public universities have a responsibility to take their wide array of expertise and put it to work in their region by helping to grow businesses and strengthen the economy,” said APLU President Peter McPherson. “The institutions that are finalists for APLU’s inaugural Economic Prosperity University Awards have all demonstrated a clear commitment to economic engagement and have followed through by delivering results. APLU will continue to serve as a resource for public universities to expand their economic engagement activities and help advance their regional economies.”

The application that universities submitted to be designated as an Innovation & Economic Prosperity University served as the basis for selecting award finalists. The case studies that each institution developed were especially central to universities’ demonstration of their best practices and were critical in determining award finalists, officials said.

Economic engagement efforts include universities working with public and private sector partners in their states and regions to support economic development through a variety of activities — innovation and entrepreneurship, technology transfer, talent and workforce development, and community development. The awards will recognize specific emphases in these areas.

The “Talent” award will honor an institution with exemplary initiatives in education and workforce development; the “Innovation” award will honor an institution demonstrating outstanding work in technology transfer, entrepreneurship, and business development; the “Place” award will recognize a university that is excelling in community, social, and cultural development work; and an “Overall” category will recognize an institution that is making connections between all of these university-engaged economic development areas.

“The APLU Innovation and Economic Prosperity Award process has given us the opportunity not just to take stock of our strengths but to identify key areas where we can improve our role as an economic driver for the region,” said M.J. Soileau, UCF’s vice president for research and commercialization. “Recognition of UCF’s innovation strengths by the APLU could not have come at a better time. As we celebrate our 50th anniversary this year, we are delighted to see our strategy for serving the Central Florida city-state selected by some of the nation’s most respected university leaders as a finalist for this distinguished award.”

A national winner will be announced in November at the APLU’s annual meeting.

APLU is a research, policy, and advocacy organization representing 219 public research universities, land-grant institutions, state

UCF National Attention continued to [page 18](#)

university systems, and related organizations. Founded in 1887, APLU is the nation's oldest higher education association with member institutions in all 50 states, the District of Columbia, and four U.S. territories.

Putnam Calls for Energy Tax Cut, Outlines Other Legislative Proposals



Agriculture Commissioner Adam Putnam said he will push in 2014 for a \$250 million reduction on sales taxes that businesses pay for energy.

Putnam outlined his legislative proposals in Orlando at the [Florida Energy Summit](#) being held by his department. He said he would propose cutting the commercial energy sales tax in half, noting that residential utility customers do not pay the tax.

Putnam said he proposes that the remaining 3.5 percent sales tax on business energy use would go toward the Public Education Capital Outlay Fund. Called PECO, the fund was established in 1963 to pay for school construction and maintenance programs but has been receiving general fund revenue since 2011.

Go SOLAR - Florida Receives Department of Energy Award to Increase Use of Solar Energy



St. Lucie County is partnering with Broward County in joining the U.S. Department of Energy's (DOE) Go SOLAR program. Several Florida governments were awarded a \$1.575 million, two-and-a-half year SunShot Initiative Rooftop Solar Challenge II competitive grant to make it easier for Floridians to obtain grid-tied solar installations.

Go SOLAR Florida is one of eight recipients of a Rooftop Solar Challenge II award nationwide. The purpose of the award is to increase the use of and access to solar energy among the state's residents and businesses by reducing market barriers, lowering non-hardware related installation costs over the next two and a half years.

The Go-SOLAR – Florida team is a partnership of Florida counties, cities, the Florida Solar Energy Center and Florida Atlantic University representing approximately 4 million Floridians. Six Florida counties are participating (Alachua, Broward, Miami-Dade, Monroe, Orange and St. Lucie), along with nine Broward County municipalities (Cooper City, Hollywood, Lauderdale Lakes, Lauderdalehill, Lighthouse Point, Margate, Pembroke Pines, Plantation and Wilton Manors) and the City of Venice in Sarasota County.

The Rooftop Solar Challenge II program empowers teams to undertake initiatives that make it easier and more affordable for Americans to go solar, reducing "plug-in" costs by streamlining permit processes, updating planning and zoning codes, and improving standards for connecting solar power to the electric grid.

The Go SOLAR – Florida team will use the funding to:

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1. Improve the solar permitting process,
2. Market solar photovoltaics and solar rights,
3. Demonstrate the importance of clean energy development and related jobs,
4. Model the benefits of intergovernmental cooperation, and
5. Collaborate on a state-wide standard for connecting solar systems to the grid.

The award also allows the team to build on the success of the first Go SOLAR Fest, which had more than 35 speakers, 1,200 attendees and 55 exhibitors sharing information on solar in Florida. Go SOLAR Fest II is scheduled for June 6 and 7, 2014, at the Greater Fort Lauderdale/Broward County Convention Center in Fort Lauderdale.

For more information, please visit broward.org/gogreen/gosolar. A Go SOLAR Fest III will also be planned for 2015.

The U.S. Department of Energy SunShot Initiative is a collaborative national effort that aggressively drives innovation to make solar energy fully cost-competitive with traditional energy sources before the end of the decade. Through SunShot, DOE supports efforts by private companies, academia, and national laboratories to drive down the cost of solar electricity to \$0.06 per kilowatt-hour. Learn more at <http://www.energy.gov/sunshot>.

The Florida Institute Funds Spyglass Technologies



Spyglass Technologies Inc. is a company that develops water sensors and software for on-site water quality monitoring. The Florida Institute for the Commercialization of Public Research has made a funding agreement with the Sarasota-based company to help Spyglass attract more private investment capital, as well as provide more job opportunities. Spyglass systems have been utilized by the Monterey Bay Aquarium Research Institute and the University of South Florida for open-ocean and coastal environments. The company assists water resource managers in effectively supervising this scarce natural resource.

Last month the Institute finalized a funding agreement with Spyglass Technologies, Inc., a St. Petersburg-based company that provides water sensors and software for on-site water quality monitoring. Based on technology developed at the University of South Florida and the Monterey Bay Aquarium Research Institute, Spyglass systems have been deployed for monitoring open ocean and coastal environments. Real time data on water quality from Spyglass helps water resource managers effectively manage this increasingly scarce natural resource. For more information, visit [here](#).

PSC Approves Third Major Natural Gas Pipeline

State regulators approved the construction of a third major natural gas pipeline Thursday that will increase Florida's capacity by 20 percent at a cost of \$3 billion.

The unanimous vote by the five-member state Public Service Commission clears the first of two major hurdles for the new system that is projected to come on line in 2017.

"The need for this project is indisputable at this time," said Commissioner Julie Brown.

Added Commissioner Eduardo Balbis: "I believe this is a good project. Having a third pipeline coming into the state, we're going to mitigate interruption. We have two existing pipelines at or near capacity."

The project still must receive approval by Federal Energy Regulatory Commission.

The new pipeline, which would run from Alabama through the heart of the Florida peninsula, would enable the state to tap more of the nation's growing shale gas sources.

In July, Florida Power & Light, which proposed the project, picked Houston-based Spectra Energy to build the new pipeline. Other natural gas users such as Duke Energy Florida and Tampa Electric also could tap the new pipeline.

FPL says the current capacity is fully contracted and the new line is needed to accommodate the growing demand in the state for natural gas.

FPL opened a 1,250-megawatt natural gas plant in Cape Canaveral in June and is constructing two identical plants in Riviera Beach and Port Everglades.

"Today was an important, positive step forward," said Sarah Gatewood, an FPL spokeswoman. She said the federal review will prove more complex as work to identify the exact corridor for the pipeline continues.

Duke Energy wants to construct a 1,600-megawatt natural gas plant by mid 2018 to replace the broken, shuttered Crystal River nuclear plant. Duke also wants to build another natural gas facility by mid 2020.

Almost 68 percent of the state's electric generation in 2012 came from natural gas.

Florida receives most of its natural gas from two pipeline companies, Florida Gas Transmission, whose line runs across the Panhandle down to Miami-Dade County, and Gulfstream Natural Gas, whose line flows from Mobile Bay, Ala., across the Gulf of Mexico, to Manatee County.

In addition to adding 465 miles of new interstate pipeline, the project also would connect the new line, called the Sabal Trail Transmission, to the other two major lines. Florida Gas Transmission and Gulfstream currently are not connected.

NextEra Energy, FPL's parent company, plans to spend \$550 million to connect all three major lines.

The public can review proposed routes for the pipeline projects during open houses scheduled in November for the connection project and in December for the new Sabal Trail Transmission line.

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Recent Funding Opportunities

FESC office tracks the energy related funding opportunities, shares them with faculty and industry partners, facilitates the submission of multi-faculty, multi-SUS university competitive proposals in response to solicitations for major research programs. The most recent funding opportunities are listed below. For a complete list please visit the [funding opportunities](#) page on the FESC website.

- **DE-FOA-0001034 -Plant Feedstock Genomics For Bioenergy: A Joint Research**
Application due date: February 25, 2014
[More Information](#)
- **DE-FOA-0000999 - FY2014 Scientific Infrastructure Support For Innovative Nuclear Research Grant**
Application due date: April 3, 2014
[More Information](#)
- **RFI-0000006 - Announcement Of Teaming Partner List For Upcoming Funding Opportunity** Announcement: Reliable
- **Electricity Based on Electrochemical Systems (REBELS)**
Submission Deadline: January 8th, 2014
[More Information](#)
- **HQ0034-OEPP-14-BAA-0001 - Fuel Hedge Implementation**
Application due date: April 24, 2014
[More Information](#)
- **RFP-IV - Gulf of Mexico - 2015-2017 GoMRI Research Consortia RFP- IV**
Application Due Date: June 2, 2014
[More information](#)

Upcoming Events

- The Florida Energy Systems Consortium (FESC) presents: The 3rd Annual Florida Colleges Energy Education Forum | Jan 31, 2014 | 9:00 a.m. - 4:00 p.m | Lake Worth, FL
- iiSBE Net Zero Built Environment Symposium | March 6—7, 2014 | Gainesville, FL
- Africa Photovoltaic Solar Energy Conference and Exhibition 2014 | Mar 27-29 | Durban, South Africa
- Florida Energy System Consortium Workshop | May 12-13| Gainesville, FL