NEWS

SOUTH CAROLINA ENGINEERING CLUSTER

www.southcarolinaengineering.org

Fall 2009

The Energy Issue

Welcome to the Fall 2009 edition of the South Carolina Engineering Cluster newsletter. The newsletter is a part of a wide range of communications that will help the South Carolina Engineering Cluster reach students, industry and potential customers worldwide. The South Carolina Engineering Cluster currently represents over 200 organizations including government, economic development, academia, engineering companies and professional societies. It is providing a forum where educators, businesses, government representatives and others can get together to discuss what we need to do to grow the engineering industry in South Carolina.

The South Carolina Engineering Cluster is part of New Carolina, South Carolina's Council on Competitiveness (www.newcarolina.org).

What is a cluster ?

New Carolina defines a cluster as a group of interconnected companies in a similar line of business that collaborate to build and expand their products and services.

Goals of the cluster:

- Promote engineering as a career choice for young students
- Promote the services of state-based engineering organizations
- Promote investment in the state's engineering economy
- Provide a forum to discuss engineering issues
- Document the accomplishments of the South Carolina engineering
- Recognize the accomplishments of South Carolina engineers

Accomplishments of the cluster:

- Organized three years ago
- Established a steering committee representing academia, industry, professional societies, economic development and government.
- Developed a directory of over 200 SC engineering companies.
- Recipient of grants to promote Project Lead the Way
- Partnership with SC Dept of Commerce to promote the South Carolina engineering industry
- Volunteers that support Engineers Week, First Robotics, MathCounts and other educational activities that encourage students to consider engineering as a career
- Recognition of South Carolina as the Green Engineering state
- Partnership with the Carolinas Nuclear Cluster to help enable the revival of the Southeast nuclear Industry

We've done a lot to date. We welcome your help. Please join us as we continue to develop and promote the Engineering industry in South Carolina.

Lee Stogner, Chair

Lee Stogner, Sen. Lindsey Graham, and Dan Bargar

Opinion / Editorial

Becoming Energy Independent, Cleaning our Environment

South Carolina Senator Lindsey Graham

Our nation stands at a crossroads as many significant issues have been ignored for decades. Among them is energy independence and passing along a cleaner environment to future generations.

As a conservative, I have always believed we can and should be better stewards of God's creation. I also know we can strengthen our economy and national security by becoming energy independent.

Last year we spent more than $440 billion on foreign oil and now find ourselves more dependent on overseas supplies than at any other time in our nation's history. Sometimes our money even goes to fund enemies bent on our destruction.

And who will ever forget last years $4 a gallon gas? America has been held hostage by foreign cartels far too long and it's now time we do something about it.

The climate change debate affords us a prime opportunity to address these issues in a way that benefits our economy, national security and environment. Even a long-time skeptic, the U.S. Chamber of Commerce has called for, "a new conversation" and believes there is now, "a solid, workable, commonsense foundation" on which to craft a bill.

Energy Independence Impact on South Carolina

South Carolina, through its many investments in research and technology, has a golden opportunity to lead the pack in an emerging green energy economy. And our state - which trails in many areas - is uniquely positioned to be one of the states to benefit the most from clean energy legislation.

In the Upstate, General Electric is leading the way in alternative energy sources by manufacturing windmill turbines. Clemson University's ICAR has an opportunity to be the national model for producing the car of the future. The University of South Carolina is on the cutting-edge in hydrogen fuel cell energy. We have ongoing bio-mass and alternative fuel research making real progress in the Pee Dee region.

Most importantly, a green economy can lead to a renaissance in nuclear energy - a field in which South Carolina has the workforce and expertise to excel. To clean up our environment, we must reinvigorate nuclear energy - the largest source of carbon-free energy worldwide.

For more than three decades our nation has refused to build and operate new nuclear power plants. Several companies have already made it clear they would like to construct at least four new nuclear reactors in South Carolina (we have seven already).

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Almost half of the electricity generated in our state comes from nuclear energy. Climate change legislation provides us the opportunity to include strong, pro-nuclear provisions that ensure these facilities, and more, are built and operational.

Finally, I believe climate change legislation should open additional regions to responsible offshore drilling. If our state consented to drilling off our shores beyond the horizon, South Carolina would share in the revenues. Every barrel we find here at home is one less we import from overseas. Let's turn "Drill Here Drill Now" from a slogan into reality.

Empowering Unelected Bureaucrats is not Conservative

We also need legislation to provide regulatory certainty to our state's business community. If Congress does not act, unelected bureaucrats at the Environmental Protection Agency (EPA) will issue regulations controlling carbon emissions. In the U.S. Supreme Court's 2007 decision Massachusetts v. EPA, the Court ruled carbon dioxide and other greenhouse gases should be regulated as pollutants under the Clean Air Act.

EPA regulation of carbon is the worst possible scenario. The EPA will destroy jobs and contain no new provisions for expanded nuclear energy or offshore drilling.

Regardless of whether you view climate change as a real threat or some grand hoax, carbon will eventually be regulated - either through congressional action or by the EPA.

Carbon Pollution is a Real Concern

I am not a scientist and do not claim to have all the answers. I can only speak from my own observations, personal experiences, and travels, particularly the Arctic Circle. They lead me to one conclusion - pollution from carbon is doing harm to our environment.

In this debate, I have set aside the extremes - those who offer doom-and-gloom street corner prophecies and those who refuse to even entertain the thought that our current way of doing business is harming our environment in any way.

Both sides prefer to talk past each other. They have yet to embrace the fact that if we work together, we can balance environmental protection with the needs of business. The Boxer-Kerry legislation and Waxman-Markey, as currently written, both fall short of the mark.

There is a pathway forward - if we choose to take it -- that creates sound environmental policy, promotes job creation and frees our nation from dependency on foreign oil. An added benefit is that many of the solutions to the problem will be found right here in South Carolina.

It's time we step up and take the lead.

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Date: 11/08/2009

(This oped began running in South Carolina newspapers on Sunday, November 8, 2009 and is reprinted with permission.)

Opinion / Editorial

South Carolina Ready to Lead in Green Engineering

Lee Stogner, Chair, South Carolina Engineering Cluster
Dan Bargar, PE, Engineering Consultant

Mention South Carolina to an out-of-stater, and he may think of the beach, terrific golf courses, or lamentably low SAT scores. What he might not know is that South Carolina is a world class center of engineering that is uniquely positioned to contribute to and benefit from the outcome of the current energy and environmental legislative debate. This legislation could bring thousands of jobs and billions of dollars to the Palmetto State.

Democrats in Congress are calling for tough new standards on carbon-based fuels purported to cause global warming. Republicans are concerned about the high cost and controversial benefits, but recognize that we must develop new sources of energy for both economic and national security reasons.

Senator Lindsey Graham made waves recently by teaming with John Kerry to support climate change legislation. They make the case that now is the time to develop the blueprint for a clean-energy future that will revitalize our economy, safeguard our national security, reduce pollution, protect current jobs and create new ones. No matter your political stripe, we can all agree that these are critical goals.

Clearly, there is much to be done. South Carolina engineers are ready to step up to our drawing boards, roll up our sleeves, and get to work.

There are over 200 engineering firms employing over 75,000 engineers in South Carolina. These experienced professionals are world class in terms of energy technology, design, and construction project management. South Carolina engineering firms generate over $3 billion in revenue for South Carolina's economy and are recognized leaders in supporting energy, infrastructure, and technology initiatives anywhere in the world.

South Carolina is particularly well poised to take advantage of any new legislation because these engineers and firms are already organized through the New Carolina Engineering Cluster. This organization, led by industry volunteers, is dedicated to promoting the engineering industry, supporting current engineering jobs, and preparing students for future engineering and technology employment. Membership of the Cluster is made up of both industry and academia: Clemson, USC, SC State, the Citadel, as well as our community colleges and prep schools are all active participants.

As professional engineers living in the Upstate, we see a South Carolina that is ready and qualified to take the lead in carrying out the necessary projects across the country and around the world. These projects will implement equipment for carbon capture and sequestration, design and install more efficient manufacturing processes, replace old inefficient lighting, heating and cooling equipment, and design and construct better highways and high speed railways. A nuclear "renaissance" that results in the design and construction of nuclear power plants will need the specialized expertise of these engineers.

All of these projects will employ many thousands of other skilled South Carolina workers; not just engineers, but craftsmen of all types. The effects of these high-paying jobs will ripple through our economy, benefiting many while providing welcome relief to our tax coffers.

The stars are in alignment: We have the people, the education, and the commitment. We must work together to develop this energy and environmental legislation in a way that recognizes and capitalizes on South Carolina's wealth of engineering resources.

(This oped began running in South Carolina newspapers on Sunday, November 1, 2009.)

Technical Topic

Renewable Energy: Place Your Bets

When most people think about renewable energy, they think of a wind farm, a solar array, ethanol or biodiesel plants, someone saying "green collar jobs," and trying to figure out if this is the next big thing. However, for people who are seriously looking at the possibilities of renewable energy for economic development, investment, or portfolio diversification, far more information is needed.

There are a great many reasons for excitement around the possibilities of renewable energy for how it can create jobs, help relieve our dependence on foreign oil, and help address concerns about climate change. Still, any opportunity in renewable energy needs to be explored within the entire context of the overall energy market, climate change/global warming, public perception, government action, local environmental impacts, as well as the standard business equation of return on investment.

The goal of this article is to share the experience that **CH2M HILL** has gained as a recognized leader in renewable energy services and as a premier environmental, consulting, engineering, construction, and operations firm. We hope to provide a starting point for your exploration into renewable energy and offer some insight before you place any bets on one form of renewable energy over another.

The Global Landscape

Is renewable energy a flash in the pan? Oil is well off its peak of $140 a barrel from the summer of 2008, the economy is slow, coal and natural gas are plentiful, and there are vocal advocates that say global warming is not caused by human activity. According to the world's major energy companies, industry trade groups, nongovernment organizations, think tanks, research labs, and many lawmakers, renewable energy is going to grow as a major part of the overall global energy mix in both the short and long term.

By 2030, the earth's population will reach 8 billion. Demand for energy, largely driven by China, India, and the Middle East, will increase 1.2 percent per year until 2030, even with gains in energy efficiency, according to a report by ExxonMobil. Even with that growth in demand, oil, gas, nuclear power, and coal will continue to provide the vast majority of the world's energy needs.

During that same timeframe, however, demand for renewable energy sources will increase exponentially. "Excluding biomass, non-hydro renewable energy sources—wind, solar, geothermal, tide and wave energy—together grow faster than any other source worldwide, at an average rate of 7.2percent per year [through 2030]," says the International Energy Agency (IEA).

The IEA also reports that renewable energy technology will overtake gas to become the second largest source of electricity, behind coal, soon after 2010. And, to meet the world's electricity demands, there will need to be a cumulative global investment of $13.6 trillion (in 2007, U.S. dollars) in the power sector.

There are those who dispute that human activity has caused climate change. On the other hand, many individuals, lawmakers, and other government representatives (including the Obama administration) believe that humankind is the major cause of global warming and that we can and should do something about it. No matter the opinion, the renewable energy market is forming and is using real money. All of this means that there is a need and great opportunity for renewable energy in the long term.

What is Driving the Renewable Energy Market?

There a host of factors that are driving the development of renewable energy. Some of the main areas that industry leaders are paying attention to include the following:

Climate Change

While this is not the only driver, it is one of the largest. As concerns about global warming continue, with science pointing to greenhouse gas emissions as a culprit, people will focus on using renewable energy as a way to secure energy without the carbon emissions costs.

Public Perception

While there remains debate about the causes of global warming, most public companies do not want to risk their corporate reputation, and their stock value, by being seen as a dirty, environmentally unfriendly firm. Businesses know that their customers are watching what they do when it comes to their treatment of the environment, and renewable energy is a large part of that equation.

Energy Price Volatility

Almost no one was ready when oil hit $140 a barrel in the summer of 2008. Its impact on consumers and businesses alike was profound. It is hard for multinational corporations, as well as mom-and-pop businesses, to develop successful strategies if they can't figure out how much it is going to cost to run the business. Businesses are looking to see if different alterative energy resources, as well as greater energy efficiency, can help control costs.

Government Regulation

In April of this year, the U.S. Environmental Protection Agencys said carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride "contribute to air pollution that may endanger public health or welfare." This ruling is expected to lead to new regulations, a first for these gases in the U.S. While regulations are made, unmade, and reinforced depending on who occupies the White House, it is likely that businesses will need to develop strategies to reduce greenhouse gas emissions—or face government fines and penalties.

Change in Washington

Part of that change in policy came with the change in administration at the White House. The Obama administration's commitment to certain environmental policies and incentives (see following) is benefitting renewable energy.

Government Mandates

Outside of federal regulation, 27 states and the District of Columbia have mandated, and five states have voluntary, Renewable Portfolio Standards. These standards require power companies need to generate a certain percent of their power from renewable sources.

Government Incentives

There are a host of federal and state programs, personal and corporate, for grants, loans, and tax deductions, credits, and exemptions that encourage using renewable energy sources.

Improved Technology/Cost Effectiveness

Renewable technologies are improving, are becoming more efficient, and are (or are nearly) commercially viable. More and more renewable technologies will be able to stand up without government subsidies.

National Security

Often overlooked as a long-term driver for the development of renewable energy sources is national security. Deliberate shortages in supply, or spikes in prices, can destabilize the U.S. economy. Renewable energy is seen as a way to lower or eliminate that dependence.

Renewable Energy Hurdles

While there are a number of key drivers that are good news for the renewable energy market, there are still variables that create significant risk. Some of the major ones to consider include the following:

Research, Design, Development, and Deployment

Will the scientists and technologists be able to harness new discoveries, design workable prototypes, and develop those prototypes into commercially scalable and profitable projects? And can they be built where there is sufficient demand?

Manufacturing and Supply Chain

Once the technical difficulties have been alleviated, there is the issue of having a sufficient manufacturing and supply chain, in the right places at the right prices, that can help the new technologies be scaled up and put into action.

Financial Markets

Venture capitalists, banks, pension funds, and other institu tional investors are hesitant to fund the development of the technologies before they are commercially proven.

Energy Storage

With coal and oil, their energy can be used at any time. With others, wind and solar specifically, if you need energy at your plant and you have no wind, what do you do? New longer-term storage solutions need to be developed to meet power needs with power availability.

Energy Policies/Prices

Energy prices are historically prone to sometimes huge swings. A dip in the cost of traditional energy, as we saw in the last part of 2008 and the first quarter of 2009, can impact financial models for the development of renewable energy. Likewise, a change in government policies can hinder the development of next generation technologies.

Energy Grid and Transmission

In some areas, significant investment will be required in order to develop the necessary infrastructure to bring power generated from renewable sources onto the general energy grid. New transmission lines will be needed, some through undeveloped areas, which may prove controversial to some.

Footprint

Large amounts of land are needed for some renewable energy sources (e.g., wind and solar) to produce the same amount of power from a traditional coal-fired or nuclear power plant. These land use and permitting issues will need to be addressed.

Water

Demand for more energy will drive demand for more water; demand for more water will drive demand for more energy. With climate change, especially severe in some regions, this could impact renewable energy development (see sidebar).

Renewable Energy Technologies and Outlook

Here are some of the major renewable technologies (excluding hydropower) that are established and are growing in importance.

Wind

Wind is turned into electrical energy through the wind turbine--the ubiquitous symbol of renewable energy. In 2008, excluding large hydropower, wind was the largest addition to renewable energy capacity, growing by 29 percent to reach 121 gigawatts, more than double its capacity in 2004, according to REN21.

Photovoltaic

This is where sunlight (and also ultraviolet radiation) is converted directly into electricity via solar cells. For most applications, one solar cell is insufficient to generate the amount of energy needed, so they are grouped to together to form an interconnected photovoltaic (PV) array.

Since 2002, PV production has been doubling every year, making it the fastest growing energy in the world. About 90 percent of the generating capacity is tied to electrical grids.

There are two main types of PV cells, crystalline silicon and thin-film. There are some promising areas of concentrated PV—concentrating solar energy onto highly efficient PV cells. A number of firms are trying to sort out the technology and economics of this approach.

Solar Thermal

There are three types of solar thermal collectors: low-, medium-, and high-temperature collectors. Low- and medium temperature collectors are usually for residential purposes of heating a swimming pool or a house.

High temperature solar thermal concentrates the sun's rays through mirrors or lenses. The focused energy heats a component (e.g., steam), and that component is used to power turbines for electricity production. There are a number of different technologies including Parabolic trough, Power Towers, Dish, and Fresnel Reflectors.

Biomass

This is using waste products such as manure, wood chips, tires, and other fuels to generate

electricity. In 2008, large- and small scale biomass power projects added an additional 2 gigawatts to total global electrical capacity.

Biofuels

The first generation of biofuels is corn based ethanol. Currently, technology is being developed to turn non-food based sources into viable biofuels such as jatropha, energy cane, algae, switchgrass, wood, waste oil, animal fat, and sugar cane.

Geothermal

This is energy harnessed from the earth's own geothermal activities, used in direct heating and electricity generation. Until recently, geothermal power and power plants needed to be located near tectonic plate boundaries, where there was geothermal activity. Recent advances are expanding the range and size of geothermal sources.

The U.S. is the world leader in developing geothermal resources and technologies. In early 2009, there were more than 120 projects under development in the U.S., according to REN21.

Opportunity and Risk

As we have seen, there are many drivers, opportunities, and risks in the renewable energy marketplace. One thing is clear: global population and economic growth will put intense pressure to increase the supply of energy in order to meet nearly certain demand. How will the U.S. and the world meet this challenge? That is one question for renewable energy to answer.

CH2M HILL is a global consulting, engineering, procurement, construction, operations, and maintenance firm with more than 25,000 professionals who manage programs and deliver projects for energy and industrial clients worldwide.

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What is the Virtual Energy Forum?

Virtual Energy Forum is a two-day online live conference that brings together Fortune 1000 executives and public sector leaders to interact and learn about sustainability, renewable energy, green building and cost-saving energy practices. The Virtual Energy Forum provides actionable information in an energy-efficient format from the ease of a PC or a Mac, with virtually no carbon footprint.

> *"We are extremely pleased with the results of the Virtual Energy Forum. The event provided us with an ideal venue to communicate our message and interact with customers and prospects in a forum dedicated to energy and the environment. This is an exciting, environmentally-responsible communications method that can change the way that events are conducted in the future."*
>
> *Ari Kobb*
> *Senior Marketing Manager, Energy & Environmental Solutions*
> *SIEMENS Building Technologies*

Brand Awareness and Reach

Position your executive as a key opinion leader in the energy field. Increase your company's reach to a qualified audience of thousands of energy stakeholders worldwide.

Time and Cost Effective

Why fly when you can go online? Save time out of office and save marketing money spent on physical exhibition costs. Our team does the work for you, leveraging your existing web site assets. No travel necessary!

Ideal Launch Venue

As the leading energy conference online, Virtual Energy Forum is ideal for new product launches. Position your product in front of the right people at the right time, detailing the ROI and end-user benefits of your solution.

The Virtual Energy Forum experience includes:

- Live streaming video presentations featuring respected industry experts
- Attendees "text in" questions to be answered in real-time by presenters
- Browsable virtual floor of energy product exhibitors, featuring live interaction with company representatives
- Peer networking through live chat
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"The Virtual Energy Forum is a great idea."

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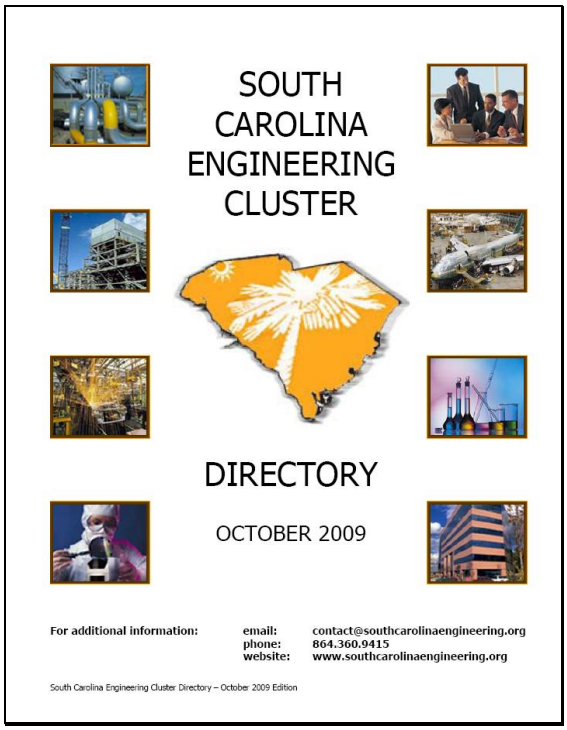
Marketing Your Company Through the Cluster

The South Carolina Engineering Cluster is developing methods to improve the marketing of the state's engineering cluster. These methods will focus on online marketing, relationship building and utilization of channels such as the South Carolina Department of Commerce and various economic development groups. One important component of our marketing program has been the development of the first South Carolina Engineering Company Directory.

As of February, 2009, over 200 state engineering companies have been listed in the directory. This directory is available for download from the Engineering Cluster web site and is being transmitted by a variety of state development groups. You can get your company listed in the directory for free by submitting your information at www.southcarolinaengineering.org. Please make sure that your web site is up to date and correct in terms of contact information. Also make sure that your directory entry contains a full description of your products and services. If it's not there, then customers and Search Engines such as Google and Yahoo can't find you.



In today's business world, many customers find buyers through the Internet. It's important to have an up to date web site and to create other electronic signage that help customers find your company. In addition to your web site, you need to create electronic Press Releases, publish online articles, participate in online business networks and establish link backs from directories.

LinkedIn®
www.linkedin.com

One way to get started with your Internet marketing program, is to
1) Join the online business network, LinkedIn and
2) Join the South Carolina Engineering Cluster group on LinkedIn.

South Carolina Engineering Cluster

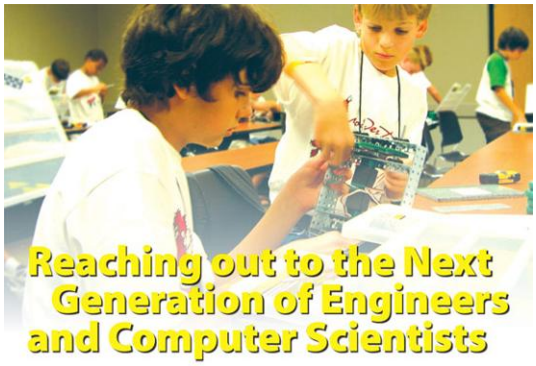
By participating in the ongoing discussions, you will have a chance to highlight the strengths of your company. This will give you visibility to over 25 million business contacts.

We also recommend putting a cluster logo / link back on your web site to the South Carolina Engineering Cluster web site.

In future issues of the newsletter, we will detail other methods of marketing and relationship building that will help you find customers and grow your engineering company.

For additional information on any of our marketing activities, please contact the committee chair, Lee Stogner – leestogner@southcarolinaengineering.org

Reaching Out to the Next Generation of Engineers and Computer Scientists



The college places a lot of emphasis on outreach efforts designed to enlighten young people -- and, to a great extent, their parents -- about careers in engineering and computing, fields of study that fall under the "STEM" (science, technology, engineering, and math) umbrella. "Our outreach focuses on high school students, middle school students, and now even elementary school students," said **Dr. Donn Griffith**, director of outreach, recruitment, and retention. "The goal is to get them thinking about science and math – and to realize those subjects can actually be fun -- and to introduce them to STEM careers, specifically engineering and computing." Such efforts serve a great need, and they take several forms.

Project Lead the Way is a national pre-engineering program curriculum. Middle and high school teachers spend two weeks on our campus to receive training in STEM courses they themselves will be teaching at their own schools.

The ***FIRST* Robotics Competition** has proved to be an exceptionally popular program with high school students. Along with their mentors, the students form teams who are given six weeks to solve a common problem by building robots from a standard parts kit.

The ***FIRST* LEGO League** challenges middle school students to solve a problem by using programmable robots. It's a great program that encourages teamwork, problem solving, and creativity. There's also a **Junior *FIRST* LEGO League**, which is the elementary school version of the program.

"In order for this country to maintain its standard of living, we have to have more young people going into engineering and computing," Griffith said. "And the greatest resources that we have right now are the nontraditional students -- minorities and females." The college therefore supports the **Partners for Minorities in Engineering and Computer Science (PMECS)** and the **Girl Scouts of America STEM camps**.

PMECS accepts 20 rising high school freshmen a year into the program, and they stay in it for their full four-year high school term. Every year, they spend several days and nights on the Carolina campus and engage in a variety of STEM experiences. The Girl Scouts STEM camp is a relatively new program. Designed for 9- to 15-year-olds, the camp works with a *FIRST* LEGO League challenge from a previous year. At the end of the camp, the participants take the program materials with them to share with other Girl Scout chapters and get them involved.

These programs, and others, serve an important role in instilling an interest in engineering and computing in upcoming generations of young people. The college extends an invitation to all of its alumni and friends to participate in these efforts. Mentoring, for example, is a key factor in ensuring the success of the programs. Women engineers and computer scientists can help encourage girls and young women to enter these professions. Minority engineers and computer scientists can do the same with minority students. Everyone's participation can make a world of difference, not only for these students, but also for the college and for our nation. To find out more about these outreach efforts, contact Donn Griffith at 803.777.7505, or donn@engr.sc.edu.

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University of South Carolina
College of Engineering and Computing
Momentum
October 2008

The Citadel School of Engineering

Mission Statement

To provide nationally recognized student-centered programs of study in civil and electrical engineering that prepares its graduates to assume principal leadership roles in the professions and their communities

Points of Pride

Programs

- ABET accredited programs in civil and electrical engineering.
- National ranked by U.S. News & World Report.
- Curriculum that provides students with a well-rounded engineering education.
- Cadet programs that combine leadership with academic excellence and that graduates individuals with strong military and civilian potential.
- Civilian evening program that provides an opportunity for nontraditional students to achieve an engineering education.
- Student-centered learning environment with an 18 to 1 student-faculty ratio.
- Well-equipped, hands-on laboratories and modern small classrooms.
- Strong and supportive engineering alumni network.

Faculty

- Members recognized regionally and nationally for teaching excellence.
- Over 95% of faculty members hold doctoral degrees.
- Significant number of the faculty members are Registered Professional Engineers with extensive industrial experience.

Students and Alumni

- Full placement of graduates seeking employment.
- Successful placement with financial assistance for those seeking enrollment in prominent graduate school such as MIT, Clemson, USC, Virginia Tech, Stanford and Georgia Tech.
- Award winning student groups (IEEE, ASCE, and Tau Beta Pi).
- Alumni who are leaders in the profession and their communities.

For more information see HTTP: //engineering.citadel.edu/

URS

- One of the largest power generation contractors with a history of over 250,000 MW installed capacity worldwide
- A history of power generation experience of more than 100 years
- Full in-house service capability from conceptual engineering through construction and start up

The URS Nuclear Center in Fort Mill, SC

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For locations and information about other URS offices, please visit www.urscorp.com

URS is a global leader in the engineering, construction, management, and services industries serving the energy, environmental, government, defense, and security markets. With approximately 50,000 employees at work on projects in more than 30 countries, we meet the needs of clients anywhere in the world. We lead the industry in our ability to provide fully integrated services that address every phase of a project.

URS is a recognized leader in the engineering, procurement, construction, and startup of power plants—both new generation projects and modifications to existing generating units. URS provides full life-cycle services for nuclear generating plants including new generation, large capital retrofits, engineering modifications, maintenance services, and outage support.

Integrated Nuclear Services

URS has been providing full service solutions to our nuclear clients for more than 60 years. Today, our in house capability meets the burgeoning challenges of the industry with experience, expertise, and depth.

- URS Nuclear Center provides complete nuclear-related services to the U.S. fleet.
- Large pool of experienced nuclear professionals—more than 7,500—in the U.S.
- Award winning project execution: recipient of awards from *POWER* magazine, *Power Engineering* magazine, and Platts Global Energy
- Energy & Environment group manages a $2.5 billion Department of Energy portfolio of high risk, technically complex programs and facilities
- Washington Safety Management Solutions: the world's largest nuclear safety/licensing consulting firm
- Our SGT joint venture is a leading U.S. supplier of steam generator and reactor vessel head replacement services
- International URS-led team selected by the UK Nuclear Decommissioning Authority to manage the Sellafield Nuclear Complex

Extensive Resources and Expertise in the Southeast

Our six strategically located offices in North and South Carolina provide the local market with planning, engineering, and environmental services including:

- Design
- Operations
- Construction
- Licensing Services
- Plant Modifications
- Civil/Transportation Engineering
- Emergency Preparedness
- Environmental Compliance
- Environmental Planning
- Information Technology
- Site Assessment/Remediation
- Water/Wastewater

URS's offices in the Carolinas include power engineering professionals and nuclear specialists

New Company Profile

sensortech™
SMART POLYMER SENSOR SOLUTIONS

SensorTech has been awarded the 2009 InnoVision award in the Small Enterprise category. The Small Enterprise Award Recognizes a small business entity, defined as an organization with fewer than 50 full-time employees or less than $20 million in revenue, for the innovative application or development of a technology-based product, process or service.

SensorTech is an advanced materials company commercializing a "smart" polymer technology (smart plastics) originally developed at Clemson University's Department of Bioengineering. This technology transforms ordinary plastic polymers into electrically conductive sensors that can measure pressure, force, torque, and vibration. Dr. Andrew Clark, the Company's Chief Technology Officer, led the research to develop this new material and method to directly measure contact between two surfaces. In 2005 Dr. Clark and Dr. Martine LaBerge, Professor of Bioengineering at Clemson University, were named co-inventors of this patent pending sensing material. In May, 2007 Chuck Pringle and Dr. Clark founded SensorTech and located temporary offices for the Company at the Clemson University incubator facility in Pendleton, S.C. In July, 2007 SensorTech was admitted into the S.C. Launch! Program and received a University Startup Assistance Grant. The Company moved from Pendleton, SC to Greenville, SC in January, 2008. In June, 2008 SensorTech became the exclusive licensee for the foundational patent with the Clemson University Research Foundation (CURF). It includes 37 broad claims based on the invention of a conductive composite material formed of a polymer and conductive filler. The first commercially available product will launch in late 2009.

SensorTech's patent pending technology converts polymers into "smart plastics" to help make other company's products and processes more intelligent. The material itself can be used as a sensor or it can be used as a component in other sensors in a wide variety of applications to measure contact force because of its durability, formability, accuracy, cost effectiveness and wide range of measurement. The electrical properties of our smart polymer sensors draw as much as 100 times less current than traditional sensors making them ideal for wireless/battery applications and energy conservation. The formability of our smart polymer sensors enables measurement of 3-D surfaces. Our technology can be developed into load cells and transducers which measure single points of force or pressure distribution sensors which measure multiple points of force. Smart polymer sensors increase productivity and improve performance.

SensorTech's Brent Buckner, David Myers, and Randy Kelly received the 2009 InnoVision Small Enterprise Award

For more information contact:
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864-298-0684
admin@sensortechcorp.com
www.sensortechcorp.com

Calendar of Upcoming Events

5th Annual First Tech Challenge Robotics Competition
December 4-5, 2009
8 am – 5 pm
James E Clyburn University Transportation
SC State University
Web site: www.usfirst.org

S.C. Future City Competition
January 23, 2010
USCA Business and Education Building
Volunteers and Sponsors needed.
Contact Stacey Gray-Feaster for additional information
sgfeaster@fairfield.k12.sc.us, 803-635-1441 Ext. 60214
Web site: www.futurecity.org

Palmetto FIRST Robotics Competition
Kick-off
January 9, 2010
Madren Center, Clemson University
Palmetto Regional Robotics Competition
March 25-27, 2010
Littlejohn Coliseum, Clemson University

All types of volunteers are needed
Contact Carla Rickenbaker for additional information,
carla.rickenbaker@att.com, 843-722-5190
Clemson web site:
http://www.ces.clemson.edu/main/FRC/index.html
National web site: http://www.usfirst.org/default.aspx

Virtual Energy Forum
January 27-28, 2010
Web site: www.virtualenergyforum.com

State MathCounts Competition
March 6, 2010
The Citadel
Contact Marguerite McClam, Palmetto Consulting Engineering Group for additional information, mmcclam@pceg.net

Calendar of Upcoming Events

ACEC-SC / SCSPE Winter Meeting
March 10, 2010
Seawell's
Columbia, SC

IEEE SoutheastCon 2010: Energizing Our Future
March 18-21, 2010
Charlotte-Concord, NC
Web site: www.southeastcon2010.org

Project Lead The Way Design Competition
March 8, 2010
University of South Carolina College of Engineering & Computing
Volunteers are needed for judging the designs. Sponsors are needed to help cover costs.
Contact Don Griffith for additional information,
donn@cec.sc.edu, 803-777-7505
National web site: www.pltw.org

InnoVenture Southeast 2010
May 11-12, 2010
Carolina First Center
Greenville, SC
Contact Butler Mullins for additional information,
butlermullins@InnoVentureCommunity.com, 864-444-0969

South Carolina Engineers Conference
June 10-13, 2010
Charleston Marriott Hotel
Sponsored by: South Carolina Society of Professional Engineers
Web site: www.scspe.org

Silver Crescent Foundation
Promotes careers in manufacturing and engineering
Events, projects throughout 2009 and 2010
Volunteers and sponsors are needed for mentoring, Camp Success, Design Challenge and more.
Contact Karen Owens for additional information, karen@SilverCrescentSC.org, 803-413-6789
Web site: www.scfusa.org

Volunteers are needed for all events.

Please list your Engineering event by sending an email to: contact@southcarolinaengineering.org

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