

## *Teachers Experience NEED's New* **HYDROGEN CURRICULUM**

Fuel cells, electrolysis, the hydrogen economy.....23 teachers were introduced to the science, technology, and social implications of hydrogen as a fuel at our March 22<sup>nd</sup> workshop in the Capital Region. Hands-on activities gave teachers direct experience with NEED's new curriculum for middle school. In addition, ISE Corp. provided a bus to the workshop that has an internal combustion engine modified to run on pure hydrogen. Staff from ISE delivered a presentation on the bus and demonstrated its operation. The teachers were impressed by the clean, odor-free combustion which produces only water vapor and a little heat as a by-product. NYSERDA's sponsorship of this program, along with sponsorship by the New York Power Authority and the Long Island Power Authority provided participating teachers with a classroom set of the curriculum as well as a kit that includes eight electrolysis stations, a model car with a reversible fuel cell, and materials for other hands-on activities. As one participant put it, "This workshop was an excellent way to gain a background in hydrogen in a short time frame. Plus, material costs to start up are non-existent!" Since the Albany workshop, dozens of teachers have attended



Teachers use electrolysis equipment from NEED's hands-on Hydrogen Kits to "split" water.

workshops around the state. NYSERDA plans to offer hydrogen workshops this fall for high school teachers. Interested? Contact us at 1-800-658-5753 or nyworkshops@need.org.

## **ESS Lead Teachers**

# *Energize Regional Workshops*

The Energy Smart Student Program owes much of its success to our lead teachers who have been participating in the delivery of our regional workshops throughout this school year. They have run activities, registered participants, and provided the necessary general support to keep things organized and running smoothly. In addition, our teachers have been manning tables and delivering presentations at conferences



Joanne Coons (on right) assisting with an ESS regional workshop.

around the state. All of this has been crucial to the growth and success of the Program. Most of all, they have brought their enthusiasm about energy education, science and technology to their role, inspiring our workshop participants along the way. They each bring their own special interests,

*(Continued on Page 2)*

### **Watt's Inside?**

- ◆ Careers in Energy: Energy Policy and Communications Specialist
- ◆ Energy Youth Awards Winners
- ◆ Calendar of Events
- ◆ Hannibal Schools Go "Infrared"

# Teachers Energize Workshops

(Continued from Page 1)

abilities, and knowledge to the program giving us the breadth and depth we need to cover such a broad, vastly complex and ever-changing field. So, here is a huge thank you to the following lead teachers:

- Bill Rock, Somers Middle School, Somers
- Joanne Coons, Shenendehowa High School, Clifton Park
- Ann Furze, Danforth Middle School, Syracuse
- Michele Dunn, Irvington High School, Irvington
- Heidi Busa, Marcellus High School, Marcellus
- Niccola Coddington, Town of Greenburgh, Greenburgh
- Laura Pershyn, Makowski Early Childhood Center, Buffalo
- Jose Pagan, Fredonia Central School, Fredonia
- Linda Armour, Duanesburg Elementary, Delanson
- Robert Jones, Kenney Middle School, Hannibal
- Maria Molyneaux, Duanesburg Junior/Senior High School, Delanson
- JoAnne LiBerti, Kodak Park School No. 41, Rochester

Our lead teachers first got involved with the program by attending in-depth training at our multi-day workshops in Hyannis and Lake George last summer. In the upcoming school year, these and other leaders will be continuing their work as part of the program and will also be expanding their roles to start delivering full-day workshops on their own.



Bill Rock assisting at a recent regional workshop



## CHECK IT OUT!

**Become an ESS Lead Teacher**  
**Attend the Leadership in Energy Education**  
**Conference, July 18-21 in Syracuse**

We're looking to expand our leadership team. We'll be inviting forty qualified teachers to spend four days with energy experts and trainers at the second Leadership in Energy Education Conference in Syracuse 7/18-7/21. Selected applicants will have all conference expenses paid in return for their participation in the support of the program. Participants will receive valuable classroom resources, such as hands-on science and energy audit equipment, designed to help students understand the science of energy, energy conservation, and efficiency. We'll also tour innovative energy facilities in the Central New York Region.

**The application deadline is 6/17.** Applications are now available online at [www.need.org/states/newyork](http://www.need.org/states/newyork) or by calling 1-800-658-5753 or emailing [nyworkshops@need.org](mailto:nyworkshops@need.org).

### **Want to Host a Workshop?**

We are putting together our schedule for next school year's workshops. We will deliver at least 12 full-day workshops at various locations around the state. Our intent is to broadly cover the state geographically, while making sure we serve the major population centers. If your school, district, BOCES, or other organization is interested in hosting, please let us know soon! Contact us at 1-800-658-5753 or [trogers@need.org](mailto:trogers@need.org). Also, additional funding can help us provide additional workshops. If your agency or company is interested in funding a workshop in your area, contact us at the number/address listed above.

### **Want to Join the Team?**

If you have been using the NEED curriculum in your classroom and have an interest in or a talent for training your peers, then consider joining our team of trainers and assistants. We're always looking for experienced teachers who want to support our mission to bring the Energy Smart Students Program to as many students as possible. We could use your help next fall with our upcoming regional workshops. Contact Todd Rogers, Program Coordinator at 1-800-658-5753 or [trogers@need.org](mailto:trogers@need.org) for details.

## Smart Resources For You!

**The Latest New York State Energy Data**  
NYSERDA has just released its latest edition of Patterns and Trends: New York State Energy Profiles: 1989-2003. What energy source provides the most energy? How much CO<sub>2</sub> was emitted statewide in 2003? You'll find the answers at [www.nyserdera.org/energy\\_information/energy\\_facts.asp](http://www.nyserdera.org/energy_information/energy_facts.asp).

### Be an Airhead

At [www.airhead.org](http://www.airhead.org) you can calculate how many pounds of air pollution are emitted per month due to your lifestyle and activities. Just fill out a quick survey and airhead calculates your results. Want to reduce your emissions? If you register, you can also track your results each month to see if you have improved. The Airhead Calculator can be used as a great, long-term, web-based, class project.

## Energy Smart Students CALENDAR

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- |         |                                                              |
|---------|--------------------------------------------------------------|
| 6/30    | Kidwind Workshop, Bronx Community College                    |
| 7/8     | Kidwind Workshop, Kenmore-Tonawanda School District          |
| 7/18-21 | New York Leadership in Energy Education Conference, Syracuse |
| 9/27    | ESS Booth, STANYS Western Section Conference, Buffalo        |
| 10/5    | ESS Workshop, Syracuse                                       |
| 11/6-8  | ESS Presentations and Booth, STANYS Conference, Ellenville   |

### Energy Facts:



**53% of U.S. electricity is generated by coal - more than any other fuel. However, in New York, only 14% is generated from coal. Over half of New York's electricity is generated by natural gas or nuclear power plants.**

*Source: New York State Energy Profiles: 1989-2003 (p.12)*

## Energy Smart Students UPDATE

### ESS Sponsored Students to Attend Tour de Sol

The Energy Smart Students Program helped to sponsor three student groups to attend this year's Tour de Sol in Albany and Saratoga Springs. Shenendehowa High School West, Newburgh Free Academy, and New York Institute of Technology attended this high-tech, high-touch "traveling festival" and competition, America's longest running event of its kind. The teachers, who received transportation stipends, will be integrating their experiences at Tour de Sol into classroom studies of energy, transportation, and the environment and reporting back to NYSERDA.

Shenendehowa is planning to establish an "exchange" program, according to Science teacher, Joanne Coons. "Students from Shen are eager to connect with the students from the North Haven Community School, an island school 12 miles east of Rockland, ME. These students demonstrated true zero-oil consumption and true zero climate-change emissions with their modified electric Ford pick-up and Volkswagen bus, respectively. At home, they recharge their vehicles from wind and solar - demonstrating what can be done when electric vehicles are recharged by green power, which can be purchased throughout the U.S. Our students would like to plan to visit their school and have them visit ours. We plan to start communicating by email." For more information on the North Haven project visit [www.IslandElectricVan.org](http://www.IslandElectricVan.org).



On the last day, New York Governor George E. Pataki presented awards to two New York high schools, placing first and second in the Solar-Assisted Vehicles Competition. The Cato Meridian H.S. Technology Team (Cato, NY) placed first in the one-person solar-car category and first in the most solar miles traveled category (7.6 miles). The Irondequoit H.S. Solar Car Team (Rochester, NY) placed second in the one-person solar-car category and third in the most solar miles traveled (2.4 miles). For more information on the Tour de Sol visit <http://www.nesea.org/transportation/tour/>.

# Watt's Happening in NY Schools?



## SEEING IS BELIEVING...

### Infrared Imaging for Energy Conservation

#### Hannibal School District Awarded a 2005 Toyota Tapestry Grant

By Carol N. Burch, Physics Teacher



From left to right: Sitting - Susan Roik, middle school math, Kathleen Francis, middle school science, Elisa Davis, middle school science. Standing - Carol Burch, high school science and Robert Jones, middle school technology

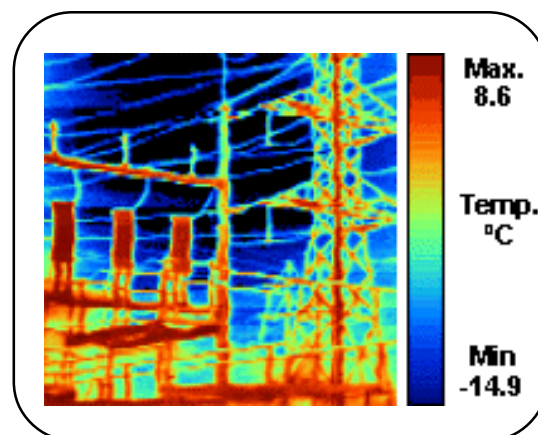
The Hannibal School District was recently awarded a 2005 Toyota Tapestry Grant for a proposal using infrared imaging for energy conservation. Photographs are powerfully persuasive tools of science, especially when they capture information our eyes can't see. Using an infrared imaging system, 175 Hannibal middle and high school students will capture and analyze infrared data from their homes and school buildings to analyze heat loss and develop an action plan for energy efficiency with cost-benefit analyses. Students will use infrared imagery to present findings to their parents, school board and community.

A collaborative partnership with the New York State Energy Research and Development Authority (NYSERDA), Entergy Corporation, Infrared Solutions Inc., and the Rochester Institute of Technology's (RIT) Center for Imaging Science will bring cutting-edge science into the hands of 7<sup>th</sup> and 12<sup>th</sup> grade students.

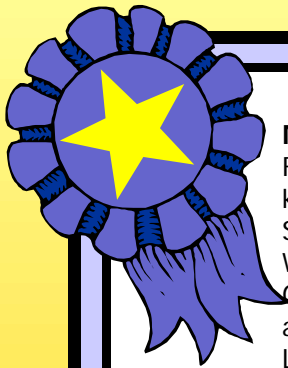
This summer five math, science and technology teachers from Hannibal will be trained at RIT in image analysis. The project team will then develop national and New York State standards-based curriculum materials and activities. This new curriculum will be fused with the Energy Smart Students Program, which uses the National Energy Education Development (NEED) Project's energy education curriculum. An energy education website will be created to share ongoing project information, infrared imagery, and link students, their families, and educators to NYSERDA's energy efficiency programs through the **New York Energy Smart<sup>sm</sup>** Program.

This fall, after a core group of high school students complete IR imaging training at RIT, they will prepare to mentor middle school students as "infrared imaging specialists." These seventh-graders will then use IR technology to perform a home energy audit. After the home imaging appointments are completed, 7<sup>th</sup> grade students will use the infrared images to study home heat loss; they will analyze their data in the classroom and prepare their findings for a community event. NYSERDA will assist Hannibal School district by presenting home energy efficiency programs to the 7<sup>th</sup> grade families and the Hannibal community. Students will also capture and analyze IR images of local public buildings in late October and identify areas of heat loss, develop conservation remedies, and make formal proposals to local officials.

The Hannibal School District is the ninth poorest in New York State. Skyrocketing fuel prices, extreme local winter conditions, and our high level of poverty call for energy conservation education and action. Actively engaging in real world, high-tech, heat transfer investigations will enable our students, their families and the community to literally see where they can save energy and money, now and in the future. It is the hope of this project that this standards-linked, interdisciplinary program will become a student-centered, real world learning experience in math, science and technology for years to come.



## NYS Youth Awards Winners



### NYS Youth Awards Winners

For 25 years, NEED has been promoting student leadership through a "kids teaching kids" approach. NEED's Youth Awards Program epitomizes this approach and New York State is pleased to be participating formally in the competition for the first time this year. We're please to announce that Rochester City School District's Wilson Magnet High School Green Team, under the direction of Terry Weiler and Don Robertson, has been chosen as the High School Level winner of New York State's first Youth Awards for Student Leadership Contest. Wilson was last year's national rookie school of the year and was honored at NEED's National Youth Awards Program in Washington, DC last spring.

Joanne Coons' students at Shenendehowa High School-West have been chosen as the winner of the New York State Rookie of the Year award. Students in Joanne's class learned about the Science of Energy Stations and produced a video that instructs teachers and students how to run the activities. If you attended the January ESS workshop in Albany, you had a chance to see Joanne's students in action as they demonstrated the Science of Energy Stations to participating teachers. Congratulations to Joanne and her students!

Both of these projects are now eligible to compete for honors at the national level, and students will be invited to attend NEED's Youth Awards ceremonies in Washington, DC on June 24<sup>th</sup>-27<sup>th</sup>.

To get an early start on next year's contest, visit <http://www.need.org/awards.htm>; you will find all of the program guidelines and forms you'll need. The materials can also be found in NEED's Projects and Activities booklet which many teachers received at our workshops this year as part of the membership packet.

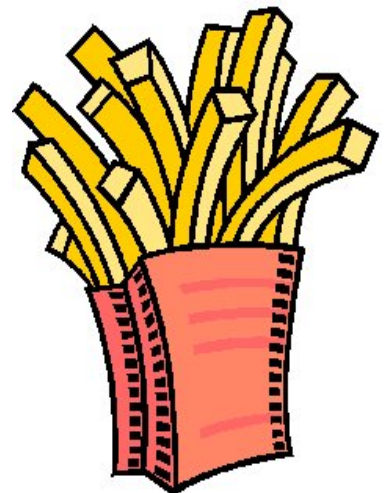


## BRING THE LATEST INFORMATION ON BIOFUELS TO YOUR STUDENTS

Free curriculum and training available

What if the fuel for your vehicle could be grown in a farmer's field? What if you could put used oil from a restaurant fryer in your gas tank and have your exhaust smell like french fries? How about developing a new industry that provides jobs and supports farmers? With biofuels these are no longer "what-if's", but a reality that is beginning to re-shape the transportation fuel landscape. Ethanol and biodiesel, the two most important biofuels to date, are both represented in the NEED curriculum.

The biodiesel curriculum materials can be downloaded from the NEED web site at no cost by going to <http://www.need.org/biodiesel.htm>. Recently, the ESS Program provided a free training for teachers on how to teach about biodiesel and biofuels in the classroom. The training was held at Western Suffolk BOCES on Long Island, and was sponsored by the National Biodiesel Board. In addition to using the activities in the curriculum, teachers also learned how to brew their own biodiesel. We hope to deliver more of these workshops to New York teachers. Keep an eye on our web site for announcements on future workshops.



# CAREERS IN ENERGY



## Energy Policy and Communications Specialist MASON ALMEIDA

There was a time when, if one wanted to work in an energy-related field, there were a few clear-cut paths to jobs in energy production, the utility sector, and government. Mason Almeida is a prime example of how broad the field has become. With a background in communications and public relations, Mason now works to provide energy-related knowledge and services to businesses in New York City. His work encompasses implementation of New York City's energy policy, as well as marketing the programs he oversees.



"I have a hard time when I try to explain to people what I do," admits Mason. "I don't have a two or three word description. It's a tricky job to wrap into a job title." As a Senior Project Manager for the New York City Economic Development Corporation (EDC), he serves as chief of staff for the City's Energy Policy Office. If you caught up with Mason on the job, you might find him talking with reporters about city energy policies or with developers of a large industrial complex about incentives they could qualify for to lower their utility rates.

The NYC EDC develops strategies to find businesses that are eligible for programs and need their services. These are mainly new commercial developments and ones undergoing significant renovation. Mason explains, "the environment here in the city for industrial and manufacturing businesses has become very strained due to the increases in costs for labor, insurance, tolls,

sanitation, etc. In addition, New York City has approximately 30%-40% higher electricity rates than New Jersey. So, we're competing in an environment where we have much higher costs for businesses versus a place that is literally in sight - just across the bridge or the tunnel. We try to level the playing field, not only with problem-solving and advice, but also with programs that lower their energy costs."

Cutting costs does not mean just lowering utility rates. Any business that Mason works with is required to get an energy survey - comprehensive evaluations of their facilities' energy usage. The reports include energy-saving recommendations along with a payback analysis of the recommendations. "I try to sell every business on implementing the measures and show them that not only will they cut their rates by going through the EDC's programs, but they can also cut their usage by implementing the recommendations in the report. I also let them know about programs through NYSERDA that actually reduce the costs of implementing those recommendations."

Mason's favorite subject in school was physics, which led him to his interest in energy policy. "I participated, through the physics club, in robotic design competitions. I always liked fixing things and taking things apart. So all through high school, I built competitive robots that would play games or enter into competitions where there would be some obstacle or some kind of challenge, and where you would play competitively

against robots from other schools. From the get-go, I was always thinking outside the box – my robots were never the strongest or the fastest, but they were the best-engineered.”

Another aspect of Mason’s robotics experience was using recycled parts for the robots. It got him thinking about environmental issues and how technology can be used to address environmental problems. Throughout his studies at Fordham University (in the Bronx), he kept his interest in the environment and came to the conclusion that energy was the area where his love of technology and the environment could make the most difference in the world. However, being in communications, his internship led him to a public relations (PR) firm where he realized that he’d rather contribute to society and to something he believed in rather than working for just any random client. “A lot of the PR clients we had were involved with things I didn’t believe in, or had direct ethical conflicts with.”

This internship really opened up Mason’s world and put him on a positive career path. “At the PR firm, I was pitching stories to the media and working for all sorts of clients the firm had. It was a fantastic opportunity. They let me talk to reporters, pitch stories and function as a full member of the staff. They even gave me my own clients even though I was just an intern.”

But an internship at the New York City Department of Environmental Protection (DEP) really moved Mason into a place where he could start putting together his interests and abilities with his values. Best of all, the internship turned into a job. “I worked in public affairs on a huge range of environmental issues. Everything from water quality and air quality issues down to issues surrounding the 2001 spraying of Malathion to kill mosquitoes carrying the West Nile Virus, which was a very big issue while I was working there; it turned into a big story in the news.”

Mason says that one of the greatest things about working for DEP was that he had the opportunity to take an electric vehicle into the field on a daily basis and educate the public about alternative fuels. “I had so much fun doing that; I realized I needed to work in a field that was part of the growing market of alternative energy.”

His work at EDC puts him right on track. Recently, Mason was involved with brokering a deal that provided the largest purchase ever of green power by a city agency. The Brooklyn Army Terminal, now run as a commercial and industrial site by EDC, recently purchased 3.7 million kWh of electricity from the Fenner Wind Farm near Syracuse. “What I love most about my job is that there are so many interesting projects. They are all very high profile, and they’re all projects that you read about in the newspaper. I characterize my client as the eight million citizens of the City of New York. And that’s a cool client for me.”

From Mason’s perspective, the growth opportunities in the energy field are vast. To students with an interest in entering the field he says, “pick a part of the world that interests you. For me it’s communications, how people relate to each other, and how strategic messages are delivered to target audiences. So, to me, it was obvious that I must go into marketing and public relations and the fields apply those skills to an area I’d be interested in.” Indeed, the energy field is now so broad that a student can apply almost any interest to the field of energy. Mason emphasizes the importance of the role of internships. “Hard work in school, great SAT scores, and getting into college are essential, but once you’re in, you’ve got to focus on how to make yourself attractive to the best internship experience possible, because that’s the launching pad. You can’t just ride life on a good transcript. You need experience.”

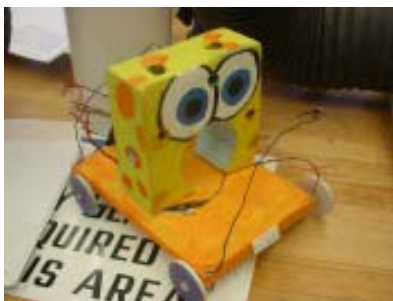
Mason and others are finding that in a growing, broadening industry with an aging workforce, there are certainly lots of opportunities for motivated students to make the move into the many career avenues of the energy field.



# A Big Thumbs Up to New York Technology Students!

Over 170 middle and high school technology students attended the annual conference on April 29 and 30 in Oswego, New York at the State University. Teacher advisors and parents escorted them; in all, 15 schools were represented.

The New York Energy Smart Students Program was a major sponsor of this event again this year. Students in Prepared and Extemporaneous Public Speaking delivered wonderful talks about energy. Students designed and raced model solar cars; the top students will go on to compete in the Junior Solar Sprint. The



favorite design was the solar car in the shape of Sponge Bob!

Top student projects in technical display, green architecture, logo design, and commercial video all will be on display at NYSERDA headquarters in Albany. Alexandra Rossi, of Somers High School, was the first place, high-school winner in the video category. Samantha Yuhas and Victor Speziale were first place winners at the middle school level. They are both from Somers Middle School. These students will

receive a travel stipend for the National TSA competition in Chicago in June. A special thanks to all the dedicated Technology teachers who worked with these students to compete at SUNY Oswego.

## The NEED Project

The NEED Project is a 501(c)(3) nonprofit education association dedicated to promoting a realistic understanding of the scientific, economic and environmental impacts of energy, so that students and teachers can make educated decisions. The NEED program includes curriculum materials, professional development, evaluation tools, and recognition.

NEED teaches the scientific concepts of energy and provides objective information about energy sources—their use and impact on the environment, the economy and society. The program also includes information to educate students about energy efficiency and conservation, and tools to help educators, energy managers and consumers use energy wisely.

All New York Energy \$mart<sup>SM</sup> programs are funded by a System Benefits Charge (SBC) paid by electric distribution customers of Central Hudson, Con Edison, NYSEG, Niagara Mohawk, Orange and Rockland, and Rochester Gas and Electric. NYSERDA, a public benefit corporation established by law in 1975, administers SBC funds and programs under an agreement with the Public Service Commission.

New York Energy \$mart<sup>SM</sup> programs are designed to lower electricity costs by encouraging energy efficiency as the State's electric utilities move to competition. The programs are available to electric distribution customers (residential, commercial, institutional, and industrial) who pay into the SBC.

**NYSERDA** STATE OF NEW YORK

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**Save Energy!**  
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